POLICY ROUNDTABLES

Competition, Patents and Innovation

2006

Introduction

The OECD Competition Committee discussed the influence of competition and patents on innovation in October 2006. This document includes an executive summary and the documents from the meeting: an analytical note by Mr. Jeremy West for the OECD, written submissions from Belgium, Brazil, Canada, the Czech Republic, Denmark, European Commission, Finland, France, Japan, the Netherlands, Switzerland, Chinese Taipei, Turkey, the United Kingdom, the United States, BIAC and papers from Professors B.H. Hall and F.M. Scherer as well as an aide-memoire of the discussion.

Overview

This roundtable focused on recent theoretical and empirical findings. It addressed the issue of whether competition stifles innovation or promotes it. Although there seems to be no universally-applicable relationship, in many industries moderate levels of competition seem to be most highly correlated with more innovation. A connection between competition and innovation also appears when the national regulatory environment is considered. Empirical studies by the OECD have found a substantial, negative correlation across national economies between the level of anti-competitive product market regulation and innovation.

The roundtable also addressed the relationship between patent rights and innovation, which varies considerably from industry to industry. Some sectors rely heavily on patents to protect the value of their inventions, while others rely more on alternative means such as secrecy and lead time. Many delegates believe that competition authorities can successfully collaborate with patent agencies to improve the patent process.

Related Topics

Intellectual Property Rights (2004)
Competition Policy and Intellectual Property Rights (1997)
Competition Policy and Intellectual Property Rights (1989)

Organisation de Coopération et de Développement Economiques
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FOREWORD

This document comprises proceedings in the original languages of a Roundtable on Competition, Patents and Innovation held by the Competition Committee in October 2006.

It is published under the responsibility of the Secretary General of the OECD to bring information on this topic to the attention of a wider audience.

This compilation is one of a series of publications entitled "Competition Policy Roundtables".

PRÉFACE

Ce document rassemble la documentation dans la langue d'origine dans laquelle elle a été soumise, relative à une table ronde sur la concurrence sur la concurrence, les brevets et l'innovation, qui s'est tenue en octobre 2006 dans le cadre du Comité de la concurrence.

Il est publié sous la responsabilité du Secrétaire général de l'OCDE, afin de porter à la connaissance d'un large public les éléments d'information qui ont été réunis à cette occasion.

Cette compilation fait partie de la série intitulée "Les tables rondes sur la politique de la concurrence".

OTHER TITLES

SERIES ROUNDTABLES ON COMPETITION POLICY

1.	Competition Policy and Environment	OCDE/GD(96)22
2.	Failing Firm Defence	OCDE/GD(96)23
3.	Competition Policy and Film Distribution	OCDE/GD(96)60
4.	Competition Policy and Efficiency Claims in Horizontal Agreements	OCDE/GD(96)65
5.	The Essential Facilities Concept	OCDE/GD(96)113
6.	Competition in Telecommunications	OCDE/GD(96)114
7.	The Reform of International Satellite Organisations	OCDE/GD(96)123
8.	Abuse of Dominance and Monopolisation	OCDE/GD(96)131
9.	Application of Competition Policy to High Tech Markets	OCDE/GD(97)44
10.	General Cartel Bans: Criteria for Exemption for Small and Medium-sized Enterprises	OCDE/GD(97)53
11.	Competition Issues related to Sports	OCDE/GD(97)128
12.	Application of Competition Policy to the Electricity Sector	OCDE/GD(97)132
13.	Judicial Enforcement of Competition Law	OCDE/GD(97)200
14.	Resale Price Maintenance	OCDE/GD(97)229
15.	Railways: Structure, Regulation and Competition Policy	DAFFE/CLP(98)1
16.	Competition Policy and International Airport Services	DAFFE/CLP(98)3
17.	Enhancing the Role of Competition in the Regulation of Banks	DAFFE/CLP(98)16
18.	Competition Policy and Intellectual Property Rights	DAFFE/CLP(98)18
19.	Competition and Related Regulation Issues in the Insurance Industry	DAFFE/CLP(98)20
20.	Competition Policy and Procurement Markets	DAFFE/CLP(99)3
21.	Regulation and Competition Issues in Broadcasting in the light of Convergence	DAFFE/CLP(99)1
22.	Relationship between Regulators and Competition Authorities	DAFFE/CLP(99)8
23.	Buying Power of Multiproduct Retailers	DAFFE/CLP(99)21
24.	Promoting Competition in Postal Services	DAFFE/CLP(99)22
25.	Oligopoly	DAFFE/CLP(99)25
26.	Airline Mergers and Alliances	DAFFE/CLP(2000)1
27.	Competition in Professional Services	DAFFE/CLP(2000)2
28.	Competition in Local Services	DAFFE/CLP(2000)13
29.	Mergers in Financial Services	DAFFE/CLP(2000)17
30.	Promoting Competition in the Natural Gas Industry	DAFFE/CLP(2000)18
31.	Competition Issues in Electronic Commerce	DAFFE/CLP(2000)32
32.	Competition and Regulation Issues in the Pharmaceutical Industry	DAFFE/CLP(2000)29
33.	Competition Issues in Joint Ventures	DAFFE/CLP(2000)33

34.	Competition Issues in Road Transport	DAFFE/CLP(2001)10
35.	Price Transparency	DAFFE/CLP(2001)22
36.	Competition Policy in Subsidies and State Aid	DAFFE/CLP(2001)24
37.	Portfolio Effects in Conglomerate Mergers	DAFFE/COMP(2002)5
38.	Competition and Regulation Issues in Telecommunications	DAFFE/COMP(2002)6
39.	Merger Review in Emerging High Innovation Markets	DAFFE/COMP(2002)20
40.	Loyalty and Fidelity Discounts and Rebates	DAFFE/COMP(2002)21
41.	Communication by Competition Authorities	DAFFE/COMP(2003)4
42.	Substantive Criteria used for the Assessment of Mergers	DAFFE/COMP(2003)5
43.	Competition Issues in the Electricity Sector	DAFFE/COMP(2003)14
44.	Media Mergers	DAFFE/COMP(2003)16
45.	Non Commercial Services Obligations and Liberalisation	DAFFE/COMP(2004)19
46.	Competition and Regulation in the Water Sector	DAFFE/COMP(2004)20
47.	Regulating Market Activities by Public Sector	DAFFE/COMP(2004)36
48.	Merger Remedies	DAF/COMP(2004)21
49.	Cartels: Sanctions against Individuals	DAF/COMP(2004)39
50.	Intellectual Property Rights	DAF/COMP(2004)24
51.	Predatory Foreclosure	DAF/COMP(2005)14
52.	Competition and Regulation in Agriculture: Monopsony Buying and Joint Selling	DAF/COMP(2005)44
53.	Enhancing Beneficial Competition in the Health Professions	DAF/COMP(2005)45
54.	Evaluation of the Actions and Resources of Competition Authorities	DAF/COMP(2005)30
55.	Structural Reform in the Rail Industry	DAF/COMP(2005)46
56.	Competition on the Merits	DAF/COMP(2005)27
57.	Resale Below Cost Laws and Regulations	DAF/COMP(2005)43
58.	Barriers to Entry	DAF/COMP(2005)42
59.	Prosecuting Cartels without Direct Evidence of Agreement	DAF/COMP/GF(2006)7
60.	The Impact of Substitute Services on Regulation	DAF/COMP(2006)18
61.	Competition in the Provision of Hospital Services	DAF/COMP(2006)20
62.	Access to key Transport Facilities	DAF/COMP(2006)29
63.	Environmental Regulation and Competition	DAF/COMP(2006)30
64.	Concessions	DAF/COMP/GF(2006)6
65.	Remedies and Sanctions	DAF/COMP(2006)19
66.	Competition in Bidding Markets	DAF/COMP(2006)31
67.	Competition and Efficient Usage of Payment cards	DAF/COMP(2006)32
68.	Vertical mergers	DAF/COMP(2007)21
69.	Competition and Regulation in Retail Banking	DAF/COMP(2007)33
70.	Improving Competition in Real Estate Transactions	DAF/COMP(2007)36
71.	Public Procurement – The Role of Competition Authorities in Promoting Competition	DAF/COMP(2007)34

TABLE OF CONTENTS

EXECUTIVE SUMMARY

by the Secretariat

Considering the discussion at the round table, the delegates' written submissions and the Secretariat's background paper, several key points emerge:

(1) The pressure of competition can spur innovation, and so can the promise of exclusive intellectual property rights. But competition and patent protection each may have mixed effects on innovation incentives. These effects depend on circumstances and vary from one industry to another. These complications make it difficult to draw general conclusions.

Innovation is responsible for most of the increase in material standards of living that has taken place since the industrial revolution. Some experts who have found that intellectual property rights ("IPR") regimes are conducive to innovation conclude that patent rights should be strengthened. Others disagree and contend that patents can sometimes impede innovation, not improve it. Furthermore, while some commentators hold that competition results in greater innovation, others claim that innovation comes mostly from companies that face little competition in contestable markets. In any event, patent policy and competition policy share the same goal, to improve consumer welfare, and should be considered complementary instruments in the pursuit of that goal.

Competition and Innovation

(2) Similarly, neither economic theories nor empirical studies have been able to determine which degree of market concentration/market contestability faced by which types of firms produces the most innovation.

Claims about the relationship between levels of competition and levels of innovation are complex and contradictory. One view holds that innovation is stronger in highly concentrated markets because large, dominant firms have more resources to pay for it and a greater prospect of reaping the rewards from it. The opposing view holds that smaller firms in more competitive environments are more likely to innovate because they have more to gain and less to lose from innovation, and indeed they may face more pressure to innovate in order to survive. And in between, there is the theory that moderate levels of market competition produce the most innovation; that is, the curve describing the relationship between concentration and innovation looks like an inverted U. Empirical research has yielded diverging results regarding the two extreme positions and it has not definitively confirmed the inverted U theory, either.

Studies of this relationship must take care in assessing the strength of competition. Although there is a tendency to identify competition with concentration, whether concentration is a good proxy for competition depends on the nature of the market in question. The number of competitors is just one of several indicators. The geographical aspect must also be taken into account, as national markets may reflect specific characteristics or constraints.

A connection between competition and innovation appears when the national regulatory environment is also considered. Empirical studies done by the OECD have found a negative correlation across national economies between the level of anti-competitive product market regulation and innovation. Of the many policy levers studied, reducing anti-competitive regulation was found to be the second most powerful incentive to raise the level of business R&D spending. Creating more competitive conditions in the market had a substantially stronger effect than enhancing the protection of IPRs on this measure of innovation.

(3) Determining whether a merger will be likely to promote or prevent innovation requires a complex, case-specific inquiry. A merger could lead to efficiencies in research and development, yet reduced rivalry and greater market power could slow the post-merger rate of technological change.

The parties to a proposed merger often claim that their transaction will yield savings in R&D costs and consequently spur greater investment in innovation. Although some mergers do save costs by eliminating duplicative R&D, protecting competition in R&D is also important because R&D is inherently uncertain. Innovation may be more likely if two companies remain separate and pursue different paths toward the same objective. It is also possible, though relatively rare, that a competition agency will approve a merger that promotes efficiencies in R&D even though it substantially increases concentration and market power, as well. The influence of innovation considerations on merger analysis is highly case-specific.

(4) Investment in innovation requires a predictable legal system and, as a result, antitrust policy should be formulated to ensure that incentives to innovate are not unnecessarily weakened or destroyed.

The view has been expressed by many experts that a strong and predictable intellectual property rights system is important to many disruptive innovations that create dynamic competition and provide consumers with major technological advances. Accordingly, IPR protection in several OECD countries has been strengthened during the past 20 years. Businesses generally have the freedom to determine the circumstances and terms under which they would like to license, and correspondingly refuse to license, their IP rights. When and whether competition law should be used to restrict that freedom is a controversial matter, but most agree that competition law should not be used as a bludgeon against IPRs. Such use could easily have a broad, negative effect on innovation incentives. Instead, compulsory licensing as an antitrust remedy should be approached with caution and ordered only after a careful review of the facts and in the face of a clear anticompetitive use of substantial market power.

As for the question of how to assess restraints on innovation and competition by dominant firms, there does not appear to be any general consensus about the proper framework to balance static and dynamic gains. As it is difficult to identify upfront whether conduct restricts innovation and therefore competition, it has been suggested by some commentators that ex post intervention, where the agencies can identify competitive harm, is to be favoured over ex ante intervention. On the other hand, others note that care has to be taken as to the effectiveness of ex post interventions, especially in situations where there is a risk that all effective competition will be eliminated. Otherwise interventions could come too late and there would be a risk of long lasting harm to consumers.

Patents and Competition

(5) *Patents do not necessarily create monopolies or dominance; firms apply for patents in the hopes of obtaining market power but only a very few inventions constitute a true innovation leading to a new product or process. Although dominance may occasionally be related to one patent, another concern is agglomerations of patents that could close off a field of technology.*

The traditional view of patents is that they provide a positive incentive for innovation but may grant some market power to firms. There is a growing concern that patents could have a negative effect on innovation, particularly where a product is dependent on many patents and in industries based on standards where there is a substantial network effect. Patents may also have a positive effect on competition. For instance, venture capitalists recognize that for investment purposes, patents are the only important asset that many high tech companies possess.

(6) *The relationship between patents and innovation is complex. The effects of patents on innovation vary substantially from industry to industry. It does not appear that innovation is always favoured by a stronger patent system or one in which patents are easy to obtain, particularly where there is much uncertainty as to outcomes with many inventions being patented but relatively few being valuable.*

Despite the lack of clear evidence that there is a positive relationship between patents and innovation in general, a number of countries began to strengthen their patent systems in the 1980s and have continued to do so. During the past 10 years or so, there has been a great surge in the number of patents issued. There are many other potential explanations for this surge besides the strengthening of patent rights, including an increase in the number of patentable inventions in knowledge-based economies, the deregulation and privatisation of national monopolies, and the impact of worldwide markets which inflates the number of global patents.

Patent rights have expanded into new fields, including biotechnology and genetic material. Software is patentable as are business methods in the US and in Europe. Furthermore, the rights themselves have been enhanced. In addition, some commentators take the position that patenting standards, notably the inventive step or the non-obviousness criteria as it is sometimes called. have probably been lowered on the whole over the last 10-20 years, making it easier to obtain patents.

Many empirical studies have been conducted to analyse the effects of these changes in patent policies. Some of them have concluded that while stronger patent rights contribute to a significant increase in the number of patents granted, they have little effect on R&D expenditures, which suggests that they are not boosting innovation significantly. For the past several years, some commentators have been raising concerns that too many patents are being issued now, that their claims are too broad, and that the rights they confer on patent holders are too strong. The result, the critics claim, is that innovation is actually being discouraged because it is difficult and costly to identify the patents that might be relevant to an invention and to pay for any necessary licenses.

Another concern relates to the application by patent offices of the same criteria for patentability across industries and technologies. Many experts have also suggested that the non-obvious requirement should be strengthened, which would reduce the number of patents being issued. In fact, the US Supreme Court tightened the non-obvious criterion this year in *KSR v. Teleflex*.

(7) There is a great heterogeneity among firms in terms of the means they use to protect their investments in innovation.

Patents seem to be an important factor in motivating firms to invest in R&D in only a handful of industries, such as the chemical and pharmaceutical industries. Surveys have also found that patents are important in the plastics and medical instruments sectors and sometimes in all or parts of special machinery industries. Elsewhere, patents are not considered to be very effective in protecting innovations. Indeed, some studies show that most firms rely on patents the least among various methods for protecting the returns from their inventions, whereas secrecy, lead time (being first to market) and customer sales and service are used most heavily.

(8) Competition authorities could collaborate with patent agencies to improve the patent process.

There are a number of ways for competition authorities to assist IP agencies in taking steps to improve the IP granting process. These include holding interdisciplinary dialogues with patent agencies to encourage greater mutual understanding of each other's field, commissioning expert reports that study a country's patent system to determine whether and how it is causing any harm to innovation, and holding seminars or hearings in which academics, public and private sector practitioners, and industry participants come together to discuss problems and possible improvements to IP policies.

Competition authorities have a core competency in examining the effects of restraints, market conduct, and rules on consumer welfare, especially when this analysis is performed through empirical research and the use of economists. Because competition authorities have experience in an effects-based method of inquiry, they can play a meaningful role in advising patent policy makers on the impact of current laws and on recommended reforms. A view expressed by a minority of the delegates is that there is little scope for a relationship between competition authorities and patent agencies. However, in some countries, such as Canada, the US, and Denmark, the competition authorities have already conducted joint studies and programs with the national patent and IP agencies.

SYNTHÈSE

Les discussions lors de la table ronde, les documents remis par les délégués et la note de référence du Secrétariat font ressortir plusieurs points importants :

(1) Les pressions concurrentielles peuvent stimuler l'innovation, tout comme la perspective de détenir des droits de propriété intellectuelle exclusifs. Cependant, la concurrence et la protection des brevets peuvent toutes deux avoir des effets contrastés sur les incitations à l'innovation. Ces effets dépendent des circonstances et varient d'un secteur à l'autre. Au vu d'une telle complexité, il est difficile de tirer une conclusion générale sur le modèle d'action le plus apte à promouvoir l'innovation.

C'est à l'innovation que l'on doit l'essentiel de l'amélioration des niveaux de vie matériels enregistrée depuis la révolution industrielle. Certains experts, qui ont observé que les régimes de droits de propriété intellectuelle (« DPI ») favorisent l'innovation, en concluent que les droits de brevet devraient être renforcés. D'autres ne partagent pas cet avis et affirment que les brevets peuvent parfois faire obstacle à l'innovation, et non la renforcer. De plus, alors que certains commentateurs estiment que la concurrence stimule l'innovation, d'autres font valoir qu'elle est principalement le fait des entreprises qui ne sont guère confrontées à la concurrence. En tout cas, la politique des brevets et la politique de la concurrence poursuivent le même objectif : améliorer le bien-être du consommateur, et elles devraient être considérées comme des instruments complémentaires pour atteindre ce but.

Concurrence et innovation

(2) De la même manière, ni les théories économiques ni les études empiriques n'ont permis de déterminer sans conteste si l'innovation est plus forte lorsque les plus petites entreprises sont en but à de fortes pressions concurrentielles ou lorsque les entreprises dominantes ne sont pas ou peu exposées à la concurrence.

Les assertions relatives à la corrélation entre le niveau de la concurrence et le niveau de l'innovation sont complexes et contradictoires. D'une part, il y a ceux qui considèrent que l'innovation est plus soutenue sur les marchés à forte concentration parce que les entreprises de grande envergure, en position dominante, ont plus de moyens pour la financer et de chances d'en recueillir les fruits. De l'autre, il y a ceux qui pensent que les entreprises de taille plus restreinte opérant dans un cadre plus concurrentiel ont davantage tendance à innover, car elles ont plus à y gagner et moins à y perdre et, de fait, elles peuvent être davantage contraintes à innover pour survivre. Entre les deux, il y a une théorie selon laquelle une concurrence modérée sur le marché est la plus propice à l'innovation ; c'est-à-dire que la courbe qui décrit la corrélation entre la concentration et l'innovation a la forme d'un U inversé. Les études empiriques n'ont corroboré aucune des positions extrêmes ; hélas, elles n'ont pas non plus confirmé de manière définitive la théorie du U inversé.

Dans les études relatives à cette corrélation, il convient d'évaluer avec prudence l'intensité de la concurrence. Bien que l'on ait tendance à identifier la concurrence avec la concentration, la question de savoir si la seconde est véritablement représentative de la première dépend de la

nature du marché considéré. L'indicateur fourni par le nombre des concurrents est souvent sujet à caution. L'aspect géographique doit aussi être pris en considération, les marchés nationaux pouvant dénoter des caractéristiques ou des contraintes spécifiques.

Un lien apparaît entre la concurrence et l'innovation dès lors que l'on prend également en compte le dispositif réglementaire du pays. Des études empiriques réalisées par l'OCDE ont fait ressortir, à l'échelle des économies nationales, une corrélation négative entre le niveau de la réglementation anticoncurrentielle sur le marché des produits et l'innovation. Il a été établi que parmi les nombreux instruments politiques étudiés, la réduction de la réglementation anticoncurrentielle se classait au deuxième rang des incitations les plus efficaces pour accroître le niveau des dépenses privées en matière de R-D. La mise en place de conditions de marché plus concurrentielles a eu sur cette mesure de l'innovation des répercussions bien plus importantes que le renforcement de la protection des DPI.

(3) Savoir si une fusion est de nature à promouvoir ou à empêcher l'innovation nécessite une enquête complexe, au cas par cas. Une fusion peut être porteuse d'efficiences dans la R-D, mais un affaiblissement de la concurrence et un accroissement du pouvoir de marché peuvent ralentir le rythme de l'évolution technologique après l'opération.

Les parties à un projet de fusion affirment fréquemment qu'elle va permettre de réduire les coûts de R-D et partant, de stimuler les investissements dans l'innovation. Bien que certaines fusions réduisent de fait les coûts en supprimant les activités de R-D faisant double emploi, il importe aussi de protéger la concurrence dans ce domaine, car la R-D est intrinsèquement marquée par l'incertitude. Les deux entreprises ont davantage de chances de réaliser une innovation en demeurant distinctes et en suivant des chemins différents pour atteindre le même objectif. Il est aussi possible, bien que relativement rare, qu'une autorité de la concurrence donne son feu vert à une fusion qui est source d'efficiences dans la R-D, alors même qu'elle accroît aussi sensiblement la concentration, ainsi que la puissance commerciale des entreprises concernées. L'influence des considérations liées à l'innovation sur l'analyse des fusions est donc propre à chaque cas.

(4) Les investissements dans l'innovation requièrent un régime juridique prévisible et, en conséquence, une politique antitrust doit être élaborée pour assurer que les incitations à l'innovation ne sont pas inutilement atténuées ou éliminées.

Un grand nombre d'experts estiment qu'un régime de DPI strict et prévisible est important pour de nombreuses innovations de rupture qui créent une concurrence dynamique et offrent aux consommateurs des avancées technologiques de premier plan. C'est ainsi que plusieurs pays de l'OCDE ont renforcé leur régime de DPI au cours des 20 dernières années. Les entreprises ont généralement la liberté de définir les circonstances et les conditions dans lesquelles elles souhaitent accepter et, en conséquence, refuser de concéder en licence leurs droits de propriété intellectuelle. La question de savoir à quel moment précis il faut recourir au droit de la concurrence pour restreindre cette liberté prête à controverse, mais de l'avis général, il ne doit pas servir à fouler au pied tous les DPI. Une telle utilisation pourrait facilement nuire dans une large mesure aux incitations à l'innovation. Au lieu de quoi, l'obligation de concéder une licence, dans une optique de lutte contre les monopoles, ne doit être ordonnée qu'après examen minutieux des faits et en cas d'abus manifeste de position dominante.

Quant à la question de savoir comment évaluer les restrictions à l'innovation et à la concurrence imposées par les entreprises dominantes, aucun consensus ne semble se dégager concernant le cadre qui s'impose pour établir un équilibre entre les avantages statiques et dynamiques ou

encore la méthodologie permettant d'identifier les comportements anticoncurrentiels de ces entreprises dominantes. Puisqu'il est difficile de savoir, de prime abord, si le comportement restreint l'innovation et donc la concurrence, d'aucuns ont laissé entendre qu'une intervention *ex post*, où les organismes concernés peuvent évaluer les résultats obtenus par le passé sur le marché, doit être préférée à une intervention *ex ante*. Parmi les autres questions fondamentales figurent l'analyse du pouvoir de marché significatif sur un certain laps de temps, ainsi que les tests indiqués pour évaluer le préjudice et les incitations financières en jeu lorsqu'une société dominante exclut ses concurrents du marché et freine l'innovation.

Brevets et concurrence

(5) *Les brevets ne créent pas nécessairement des monopoles ou des positions dominantes ; les entreprises déposent des demandes de brevet dans l'espoir d'obtenir un pouvoir sur le marché, mais rares sont les inventions qui constituent une véritable innovation conduisant à un nouveau produit ou procédé. Bien que les positions dominantes soient occasionnellement liées à un brevet, la concentration des brevets est également une source d'inquiétude, car elle risque de condamner un secteur technologique entier.*

Les brevets passent traditionnellement pour une incitation positive à l'innovation, mais ils peuvent conférer aux entreprises un pouvoir de marché à court terme. On craint de plus en plus que les brevets aient un effet négatif sur l'innovation, notamment lorsqu'un produit dépend d'un grand nombre de brevets et dans les secteurs reposant sur des normes où l'effet de réseau est important. Les brevets peuvent aussi avoir un impact positif sur la concurrence. Les investisseurs en capital-risque, par exemple, sont conscients qu'à des fins d'investissement, les brevets sont le seul actif important d'un grand nombre d'entreprises de haute technologie.

(6) *La corrélation entre les brevets et l'innovation est complexe. Les répercussions des brevets sur l'innovation varient sensiblement d'un secteur à l'autre. L'innovation ne semble pas toujours tirer parti de l'existence d'un régime de brevets plus strict ou d'un régime permettant d'en obtenir aisément, notamment lorsqu'une grande incertitude règne quant aux résultats, car si un grand nombre d'inventions sont brevetées, elles sont rarement utiles.*

Bien qu'aucun élément n'atteste d'une corrélation positive entre les brevets et l'innovation en général, plusieurs pays ont commencé à renforcer leur régime de brevets dans les années 80 et continuent de le faire. Ces dix dernières années, environ, le nombre des brevets délivrés a considérablement augmenté. Outre le renforcement des droits de brevet, de nombreux phénomènes peuvent expliquer cette progression, et notamment une hausse du nombre des inventions brevetables dans les économies du savoir, la déréglementation et la privatisation des monopoles nationaux et l'impact des marchés mondiaux qui gonfle le nombre des brevets internationaux.

Les droits de brevet ont été étendus à de nouveaux domaines, notamment la biotechnologie et le matériel génétique. Les logiciels sont brevetables, à l'instar des méthodes commerciales aux États-Unis et en Europe. Qui plus est, les droits eux-mêmes ont été renforcés. De surcroît, il est probable que les normes de brevetabilité, notamment l'activité inventive – ou critère de la non-évidence, selon certaines appellations – ont été assouplies de manière générale au cours des 10 à 20 dernières années, facilitant ainsi l'obtention d'un brevet.

De nombreuses d'études empiriques ont été réalisées afin d'analyser les conséquences des changements intervenus dans les politiques de brevets. Certaines d'entre elles sont parvenues à la conclusion que si le renforcement des droits de brevet contribuait bien à une augmentation

significative du nombre de brevets délivrés, il n'avait que peu d'effets sur les dépenses de R-D, ce qui donne à penser qu'une mesure en ce sens ne favorise pas l'innovation de façon notable. Depuis quelques années, les commentateurs constatent avec inquiétude que le nombre de brevets délivrés de nos jours est excessif, que le champ des revendications auxquelles ils donnent droit est trop large et que les droits qu'ils confèrent à leurs titulaires sont trop importants. Selon les critiques, il en résulte que l'innovation est de fait découragée, car il est trop difficile et trop coûteux d'identifier les brevets qui pourraient être pertinents dans le cadre d'une invention et de financer les licences qui pourraient s'avérer nécessaires.

On peut aussi s'inquiéter de voir les offices des brevets utiliser le même critère de brevetabilité pour tous les secteurs et toutes les technologies. Selon de nombreux experts, l'obligation de non-évidence devrait également être renforcée, ce qui aurait pour effet de limiter le nombre des brevets délivrés. De fait, la Cour suprême des États-Unis a renforcé cette année le critère de non-évidence dans l'affaire *KSR-Teleflex*.

(7) Les moyens utilisés par les entreprises pour protéger leurs investissements dans l'innovation sont extrêmement hétérogènes.

Ce n'est que dans quelques secteurs (industries chimique et pharmaceutique, notamment) que les brevets jouent un rôle non négligeable dans la motivation des entreprises à investir dans la R-D. Selon certaines enquêtes, ils ont également une fonction importante dans les matières plastiques et les instruments médicaux, ainsi que dans tout ou partie des secteurs des machines d'usage spécifique. Ailleurs, on considère que les brevets ne sont pas des instruments très efficaces pour protéger les innovations. De fait, certaines études montrent que parmi diverses méthodes permettant aux entreprises de protéger la rentabilité de leurs innovations, les brevets sont celle qu'elles utilisent le moins souvent, alors qu'elles recourent principalement au secret, à l'avance sur la concurrence (en étant les premières à commercialiser un bien ou un service), ainsi qu'aux ventes et aux services au consommateur.

(8) Les autorités de la concurrence pourraient collaborer avec les organismes en charge des brevets pour améliorer le processus de délivrance de ces brevets.

Les autorités de la concurrence ont diverses méthodes à leur disposition pour aider les organismes de protection de la propriété intellectuelle à prendre des mesures pour améliorer le processus d'octroi des DPI. Ainsi, elles peuvent organiser des débats interdisciplinaires avec les offices des brevets afin de permettre une meilleure compréhension mutuelle des domaines de chacun. Elles peuvent commander des rapports d'experts sur le régime de brevets d'un pays pour déterminer si, et de quelle façon, un tel régime nuit à l'innovation. Elles peuvent enfin organiser des séminaires et des auditions réunissant des chercheurs du monde universitaire, des représentants du secteur public et du secteur privé, ainsi que des intervenants dans un secteur donné pour évoquer les problèmes posés par les politiques de propriété intellectuelle et les améliorations pouvant être apportées à ces politiques.

L'une des compétences clés des autorités de la concurrence est d'analyser les effets des restrictions, des comportements sur le marché, ainsi que des règles sur le bien-être des consommateurs, notamment lorsque cette analyse est réalisée par le biais de travaux empiriques et en faisant appel à des économistes. Puisqu'elles ont l'habitude d'enquêter à partir des effets observés, elles peuvent jouer un rôle significatif en conseillant les responsables de la politique des brevets sur l'impact de la législation actuelle et sur les réformes qui s'imposent. Une minorité des délégués jugent peu probable que les autorités de la concurrence établissent des relations avec les offices des brevets. Toutefois, dans certains pays comme le Canada, les États-Unis et le

Danemark, les autorités de la concurrence ont déjà mené des études et des programmes conjoints avec les organismes nationaux chargés des brevets et de la propriété intellectuelle.

BACKGROUND NOTE

1. Introduction

Innovation is a subject that has preoccupied economists for a long time, and with good reason. Innovation is responsible for most of the increase in material standards of living that has taken place since the industrial revolution.[1] New and improved products, services, and manufacturing processes are the main engine of economic growth. In fact, it is widely believed that innovation's dynamic effect on consumer welfare far outweighs the static effects on which competition policy often focuses. But while some commentators believe that competition itself leads to greater innovation, others have argued that the most innovative companies are those who face little or no competition. That is an old debate among economists, and it continues to fuel both theoretical and empirical work. Similarly, while many experts believe that intellectual property rights ("IPR") regimes are conducive to innovation and that patent rights should generally be strengthened, others question that connection and contend that patents can actually impede innovation under some conditions.

This subject area is full of unanswered questions. Not only is it unclear which paradigm – the pressure of competition versus the reward of exclusive rights – leads to more innovation, but both competition and patents appear to have mixed effects on innovation. To a large extent, outcomes in particular industries appear to depend on specific circumstances. The purpose of this Note is to explore and clarify those circumstances in the hope that this will help competition agencies to promote industry structures and levels of competition that encourage innovation, as well as to contribute to dialogues on the impact of IPR policy on innovation.

Although most people have a basic idea of what innovation is, it may be helpful to make a few clarifying points about it. Innovation means the successful development and application of new knowledge. It therefore involves more than just invention. Fixed capital investments are often necessary for producing and using new products and processes, as are employee training and organisational restructuring. It is convenient to view innovation as a process that involves many different stages, from research and development (R&D) to the development of prototypes, patent application, and finally, commercial applications. Many ideas may not lead to commercial success, of course. Furthermore, patents may be granted for inventions that were not based on any formal R&D process. Indeed, many useful innovations are not reflected in either patents or R&D statistics. Empirical work suggests that there are positive relationships between each stage of the innovation process, though. Therefore, policies that affect R&D will also have some eventual effect on patenting, and vice-versa, as well as on the commercial introduction of innovative products.[2]

The primary aim of this Note is to explore the roles of patents and competition both as stimulants and inhibitors of innovative activity. Many other factors influence incentives for investing in R&D and new product development. They include, among many other things, the degree of technological opportunities present in an industry, regulatory controls (such as pharmaceutical safety regulations), long-term demand,

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1 OECD, Going for Growth (2006) at 56.

2 Florence Jaumotte & Nigel Pain, "Innovation in the Business Sector," OECD, ECO/WKP(2005)46, Economics Department Working Paper no. 459 at 13 (2005).

real interest rates and tax laws. This Note does not address those other factors. Furthermore, the Note does not deal directly with enforcement issues, such as how various IPR licensing arrangements or other strategic uses of IP may or may not violate competition laws. Finally, it does not directly address the huge topic of how to design a comprehensive competition policy that maximises innovation. Instead, it focuses on the more modest goal of providing a useful background on theoretical and empirical evidence regarding how various degrees of patent protection and competition influence innovation.[3]

Part 2 reviews theoretical and empirical findings about the relationship between patents and innovation. It looks at both the influence of patent rights on innovation in general and the effects that stronger patent policies have had on innovation since the 1980s. It also examines some arguments in favour of reforming patent systems, touches on some ways that competition officials can work toward improving the patent system, and explores the major alternatives to patents for companies wishing to protect their innovations from imitators. Part 3 discusses the theoretical and empirical findings about the relationship between competition and innovation. As is the case with patents and innovation, it appears that there is no universal rule that can predict the influence of competition on innovative activity in every situation. Instead, different conditions lead to different outcomes. Certain policy implications are discussed, as well.

The main points of this paper are:

- The relationship between patents and innovation is complex. The effects of patents on innovation vary substantially from industry to industry. That makes it very difficult to describe the relationship in universal terms. But with just a few exceptions, it can at least be said that according to the data, whatever role patents play in innovation is a relatively small one. Patents seem to be an important factor in motivating firms to invest in R&D in only a handful of industries, such as the chemical and pharmaceutical industries. Elsewhere, patents are not considered to be very effective in protecting innovations. In fact, some studies show that most firms rely on patents the least among various methods for protecting the returns from their inventions, whereas secrecy and lead time are used most heavily.
- Nevertheless, there has been a great surge in the number of patents issued during the past 15 years or so. A possible explanation for the surge is simply that there has been a great increase in innovative activity, so there is more to patent. Several empirical studies have cast doubt on greater innovation as the primary cause, though. Instead, the studies attribute the patent surge to factors such as declining patent application fees and growing pressure to build up large patent portfolios for the purpose of negotiating with other patent holders.
- Despite the lack of clear evidence that there is a positive relationship between patents and innovation in general, a number of countries began to strengthen their patent systems in the 1980s and have continued to do so. As a result, patent rights expanded into new fields, the rights themselves were enhanced, and it became easier to obtain them. For the past several years, commentators have been raising concerns that too many patents are being issued now, that their claims are too broad, and that the rights they confer on patent holders are too strong. The result, the critics claim, is that innovation is actually being discouraged because it is so difficult and costly to identify the patents that might be relevant to an invention and to pay for any necessary licenses.
- Many empirical studies have been conducted to analyse the effects of these changes in patent policies. Some of them have concluded that while stronger patent rights contribute to a

[3] For Notes that do address enforcement issues related to IPRs, see OECD, DAF/COMP(2004)24, Intellectual Property, Background Note; OECD, DAFFE/COMP(2002)20, Merger Review in Emerging High Innovation Markets, Background Note.

significant increase in the number of patents granted, they have little effect on R&D expenditures, which suggests that they are not boosting innovation significantly. Other studies show that expanding patent rights into new areas like software has led to a kind of patent stampede, in which firms rushed to collect patents on existing technologies for use as bargaining chips in licensing negotiations. Still others have found that policy changes such as raising the amount of compensation awarded in patent infringement litigation are not perceived by firms as having a significant impact on their innovative activity.

- There are a number of ways for competition authorities to assist IP agencies in taking steps to improve the IP granting process. These include holding interdisciplinary dialogues with patent agencies to encourage greater mutual understanding of each other's field, commissioning expert reports that study a country's patent system to determine whether and how it is causing any harm to innovation, and holding seminars or hearings in which academics, public and private sector practitioners, and industry participants come together to discuss problems and possible improvements to IP policies.
- The effect that competition has on innovation has been studied and debated by economists for many years. Two very different views have emerged. One view holds that large, dominant firms are most likely to produce innovations, whereas the other view is that smaller, more competitive firms are more likely to innovate. Competition agencies tend to endorse the latter view. Unfortunately, neither economic theory nor empirical studies are able to resolve the debate because they both reach mixed results.
- Theoretical conclusions about the relationship between competition and innovation depend on several factors, such as whether the innovation involves a process or a product, (if it is a product innovation) whether it is geared toward developing a new product or improving an existing one, and how much competition there is in a given market in the first place. Different assumptions about these factors produce different results, with some supporting the idea of highly innovative monopolists and others supporting the idea of highly innovative, vigorously competitive firms. Other theories, however, postulate that the most fertile markets for innovation are those in which the level of competition is neither very low nor very high, but moderate.
- Early empirical studies supported the theory that moderate levels of market concentration (an admittedly imperfect proxy for the level of competition) produced the most innovation. Those studies were later discounted because they failed to account for certain other explanatory factors. However, more recent studies that do account for additional factors seem to have revived the moderate competition hypothesis.
- Certain empirical studies done by the OECD take an entirely different approach and search for a correlation between the level of anti-competitive product market regulation and innovation across entire national economies. Interestingly, they find that the relationship is significant and negative, leading to the conclusion that reducing such regulation can pay large dividends. In fact, of the many policy levers studied, reducing anti-competitive regulation was found to be the second most powerful thing that governments could do to raise the level of business R&D spending, and it was six times stronger than enhancing IPRs.

2. Patents and Innovation

The number of patents issued around the world has grown markedly over the past 20 years.[4] As patented inventions have become increasingly common throughout the economy, their influence on innovation and economic performance has become more important. As we will see below, however, the

[4] See, e.g., Carl Shapiro, "Patent System Reform: Economic Analysis and Critique," 19 Berkeley Technology Law Journal 1027 (2004).

greater number of patents being issued does not necessarily mean that greater innovation is occurring. In fact, a key question is whether the influence of patents may be net negative in some industries.

Patents encourage innovation in several ways. First, they give inventors greater incentives to invent by providing a measure of protection against imitators, who might otherwise let the inventor do all the hard and costly work of developing a technology and then simply copy it, making it difficult for the inventor to earn an attractive return. Second, and in exchange for that protection, patents require the inventor to tell the public that the technology exists and to explain how it works. That disclosure enhances the process of knowledge diffusion by helping others to understand the invention and improve upon it or incorporate it in a new invention of their own. In other words, there is a technology spill-over effect that stimulates new ideas. Another benefit of disclosure is that it tends to decrease redundant R&D investments by firms who might otherwise continue trying to develop exactly the same technology. Finally, patents add to knowledge diffusion by facilitating exchanges via licensing agreements.

On the other hand, the exclusive rights that patents confer may distort competition and prevent the efficient allocation of resources. They may also impede follow-on innovation. Therefore, as the patent boom continues, there is a growing need to ensure that patent systems strike the right balance between helping patent owners to appropriate returns from their innovations and fostering technological progress for society as a whole.

Not very long ago, a company working on a new product might have had to be wary of a handful of relevant patents and make sure that it either designed around them or obtained a license. It was relatively easy to know what to watch out for, to sidestep it if possible or to negotiate licenses to it if necessary. Today, however, a firm designing a high-tech product may need to wade through thousands of potentially problematic patents to avoid infringing them. More patents per year are being awarded than ever before, and the rate is continuing to climb.[5] Significant changes in patent policies in recent years have made it easier to obtain patents in general and in some jurisdictions the scope of what is patentable has been extended to include genetic inventions, software, and business methods. Furthermore, other changes have made it easier to enforce patent rights and have stiffened the legal consequences of infringement. The effects of these changes on innovation are not entirely clear yet, but together they have raised concerns that the effects are actually negative. For example, some worry that a "patent thicket" has developed. That is, there is a concern that so many patents are issued now that innovation is being discouraged because it has become too difficult, too time-consuming, and too expensive for innovators to navigate around everyone else's patents.

This section of the Note examines theoretical and empirical evidence concerning the general relationship between patents and innovation, as well as evidence regarding the impact of changes in patent policy, to see what conclusions can be reached about whether patents are encouraging innovation or deterring it. It turns out that broad, definitive statements about the impact of patents on innovation are difficult to make because the effects vary substantially by industry sector and technological field. But with certain exceptions, it can be said that patents appear to be playing a relatively small role in innovation.

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[5] Jaumotte & Pain, supra note 2 at 20, 22 (showing that patents per capita have increased in OECD countries over the past 20 years); Adam Jaffe & Josh Lerner, "Innovation and Its Discontents," in Adam Jaffe, Josh Lerner & Scott Stern (eds.), vol. 6 Innovation Policy and the Economy, NBER (forthcoming) (noting that the growth rate of the number of US patents granted during the period 1983 to 2004 was 5.4% per year versus a growth rate of 1% per year from 1930 to 1982).

2.1 Patents and innovation – background and theory

A great deal of scholarly attention has been devoted to the relationship between patents and innovation. In recent years, a number of commentators have expressed concern that too many patents are being issued, their scope is becoming too broad, they are too easy to obtain, and the legal rights attached to them have become too powerful.[6] Some observers believe that these developments have changed patents from being innovation facilitators to being innovation retardants. This section of the Note examines their concerns on both theoretical and empirical grounds.

Patents reward inventors for their discoveries. They do that by giving patent holders the exclusive right to make, use, and sell inventions for a limited time (usually 20 years) within the jurisdiction(s) where an application was filed. If the patent is infringed, the patent holder may sue the infringer to recover lost profits. In return for the patent rights, applicants must disclose their inventions in the text of their applications. These disclosures must include a specification of the invention with instructions that are adequate to enable a person skilled in the field to produce or perform the invention. In other words, the specification must be "enabling." The invention itself is defined in the "claims," which are part of the specification. In general, patents are supposed to be granted only for inventions that are novel, non-obvious, and useful (having an industrial application).[7]

Ideally, a patent right (and the market power it might create) should be granted only if, and only to the extent that, it is necessary to encourage the innovation covered by the right. That framework does not provide practical operational standards, but it is the right question to be asked in principle. The general requirements of non-obviousness, novelty, and utility can be seen as a proxy for this question.

Patent "scope" or "breadth" helps to determine the value of a patent by setting the boundary between what is protected and what is not. The broader the scope, the more likely it is that any competing products and processes will infringe the patent. "Patentability" refers to how easy or difficult it is to meet the standards for obtaining a patent on an invention. Patent breadth and patentability can have both positive and negative effects on innovation. This is a potential source of frustration for policymakers, who may find that adjusting the available policy levers for patentability and patent breadth leads to unpredictable results.

Beginning with the positive effects, the easier it is to obtain a patent, the broader the patent is allowed to be, and the longer it lasts, the greater a potential innovator's expected reward for a contemplated innovation tends to be. The higher the expected reward is, the more likely the inventor is to undertake the innovation. Furthermore, to the extent that easy patentability and broad scope cause competitors to make greater or more diverse investments in R&D so as to invent around the patents, stronger patent rights may lead to more innovation. Alternatively, competitors may opt to concede the patent holder's market but

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6 See, e.g., National Academy of Sciences, A Patent System for the 21st Century 41-49 (Stephen Merrill, ed.) (2004); Robert Merges, "As Many as Six Impossible Patents before Breakfast: Property Rights for Business Concepts and Patent System Reform," 14 Berkeley High Technology Law Journal 577 (1999).

7 There are some differences among jurisdictions concerning the legal standards for patentability. Inventions must have a "technical character" in Europe, for example. Similarly, Japanese patent law defines a patentable invention as "the highly advanced creation of technical ideas utilising natural laws." Japan Patent Law (1959), Article 2(1). In the United States, on the other hand, "whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore." United States Patent Act, 35 USC. Section 101. Consequently, patentable inventions have been described as "anything under the sun made by man" that satisfies patentability requirements. United States Congress Committee Reports, S. Rep. No. 82-1979 at 5 (1952); H.R. Rep. No. 82-1923 at 6 (1952).

invest in an entirely new market instead, leading to innovation that might not have occurred if the patent in the first market had not been granted.

The negative effects have to do with the fact that the easier it is to obtain patents and the broader they are, the more of them will tend to be issued and the more comprehensive they will be (up to a saturation point). That, in turn, can lead to five types of costs. First, static inefficiencies increase because more patents and greater patent breadth make monopolisation and its attendant deadweight losses more likely. Second, dynamic inefficiencies increase because it will become more difficult for others to invent without infringing someone else's patent. Third, a greater number of broader patents will encourage socially wasteful rent-seeking behaviour, such as patent trolling. Fourth, enforcement costs will be higher since there will be more to enforce. Finally, it is possible that overbroad patent rights and easier patentability will lead to inefficient overinvestment in R&D.[8]

Some believe that when patents are awarded too easily, or are allowed to protect very broad claims, a vicious cycle arises that deters innovation. This happens because the body of issued patents eventually covers so much substantive territory that companies are forced to recognise a substantial likelihood that their innovations will lead to accusations of infringement by other companies. To reduce their risk, businesses amass larger and larger patent portfolios in a kind of IP arms race in which patents are collected mainly for use as bargaining chips in the event of an infringement problem. But of course the act of building up those portfolios adds to that problem. With so many patents already granted and more being issued all the time, it becomes harder and harder to know who is likely to sue, to feel confident about one's chances of successfully fending off an infringement suit, and to negotiate and pay for the licenses deemed to be necessary. The result, in theory at least, is to raise the overall cost of doing R&D and therefore to discourage innovation. That situation is known as a patent thicket or an anti-commons.[9] It is thought to be particularly discouraging to start-up firms because they usually lack the sizeable patent portfolios that can serve as bargaining leverage that will help a firm to navigate through patent thickets.

In the United States and several other countries, the foremost concern has been that too many issued patents do not meet the statutory tests of novelty or utility or that they would have been obvious to people skilled in the relevant technologies.[10] If this is happening, society is giving away patent rights but getting less technological progress than it is owed. More specifically, when governments grant patents on obvious "inventions," they may confer market power without receiving an appreciable innovation benefit in return. Therefore, the patent holder gets an unjust reward at the expense of consumer welfare. What is worse, a torrent of easily obtained patents may facilitate strategic patent blocking, where one company obtains a patent not because it wants to protect technology that it plans to use, but because it wants to thwart a rival's technological progress.

Easier patentability ease and greater patent breadth also raise the difficulty, cost, and risk of incremental innovation by making infringement a larger concern. That tends to reduce follow-on innovation for two reasons. First, the patent holder is more likely to feel satisfied with the strength of its patent position and therefore may be less likely to invest in further innovation. Second, follow-on

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8 Mark Lemley, "Property, Intellectual Property, and Free Riding," 82 Texas Law Review 1058-59 (2005) (Lemley was writing only with respect to over breadth, but his reasoning applies to loose patentability standards, as well).

9 For more on the anti-commons theory, see Michael Heller & Rebecca Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research," 280 Science 698 (1998); OECD, DAF/COMP(2004)24, Intellectual Property, Background Note 24-25.

10 See, e.g., Shapiro, supra note 4 (contending that "the chorus of complaints about the US patent system has grown louder in recent years," and that "some of the most powerful complaints now are coming from companies that themselves own many patents").

innovators are more likely to need a license to the original patent before they can reap any benefit from their work. The task of identifying and paying for the necessary licenses consumes valuable resources. Those resources are wasted when unwarranted or overly broad patents are issued. In fact, a "loose" patent policy could lead to a situation in which so many necessary inputs are patented that the money and time required to identify and procure licenses discourages or even stops further innovation in a given field of research.

Consider the comments of an executive from Texas Instruments: "TI has something like 8000 patents in the United States that are active patents, and for us to know what's in that portfolio, we think, is just a mind-boggling, budget-busting exercise to try to figure that out with any degree of accuracy at all."[11] If a company with the resources of Texas Instruments cannot afford to know even what it has in its *own* patent portfolio, one can imagine how hard it could be for small potential entrants to determine their risks of triggering a patent infringement lawsuit.

A difficulty for policymakers is that it is virtually impossible to quantify the net value of the innovation that will be gained or lost if they opt for a tighter or looser patent policy. Nevertheless, a substantial amount of theoretical work has been done to aid policymakers who are interested in optimal patent standards.[12] An introduction to that work follows, but since methods for designing patent standards are not our main concern here, it is a brief one.

Many of the theoretical frameworks express optimal patent regimes as a trade-off between patent breadth and patent length. Gilbert and Shapiro, for example, define patent scope as the price that a given innovation will bring in the market. Using their model to calculate the maximum social surplus for all combinations of patent breadth and duration that generate enough revenue to meet R&D costs, the authors conclude that the optimal patent length is infinite and that the optimal scope is just broad enough to cover the R&D investment.[13]

Gallini reached the opposite result when she recharacterised patent breadth as a determinant of the ease of entry into the invention's market. In her model, patent breadth is the cost that entrants must bear to imitate the invention without infringing it. A narrower scope results in a lower price because it will be easier for competitors to invent around the patent. The implications for longer patent durations are mixed, though. Up to a certain length, increasing the patent's duration will raise the inventor's profit. Eventually, though, the duration becomes long enough that it starts to encourage competitors to invest in R&D with the aim of inventing around the patent. At least some of that R&D will be redundant and therefore wasteful. Gallini's objective is to find the combination of breadth and duration that minimises the two types of social costs that patents carry: deadweight loss and redundant R&D. She demonstrates that the best design avoids redundant R&D altogether by making patents broad and short-lived.[14] If patents are broad enough

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11 Testimony of Frederick Telecky, US FTC/DOJ Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy (28 February 2002), available at www.ftc.gov/opp/intellect/020228ftc.pdf (quoted in Brian Kahin, "Through the Lens of Intangibles: What Patents on Software and Services Reveal about the System," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 211).

12 Much of this discussion is derived from Nancy Gallini & Suzanne Scotchmer, "Intellectual Property: When Is It the Best Incentive System?," in Innovation Policy and the Economy, vol. 2, Adam Jaffe, Joshua Lerner & Scott Stern (eds.) 63-69 (2002).

13 Richard Gilbert & Carl Shapiro, "Optimal Patent Length and Breadth," 21 RAND Journal of Economics 106 (1990).

14 Nancy Gallini, "Patent Length and Breadth with Costly Imitation," 44 RAND Journal of Economics 52 (1992).

to discourage attempts to invent around them, but so fleeting that they give the inventor only enough time as a monopolist to recover its costs, then competitors will simply wait for the patent to expire and then copy the invention, while deadweight loss is minimised.

Maurer and Scotchmer later pointed out that Gallini did not take into account the possibility of licensing. Specifically, the problem of redundant R&D spending could easily and voluntarily be avoided by private licensing rather than by adjusting public patent policy.[15] That reinstates the Gilbert and Shapiro prescription of narrow, perpetual patents as the theoretical ideal.

The models above assume that innovation is a discrete process that leads to one separate invention at a time. Often, however, innovation is cumulative in the sense that it builds on previous inventions. Thus, R&D may be undertaken for the purpose of improving an existing technology or finding a new application for it, rather than creating an entirely new and independent invention. Incorporating that consideration adds a number of intricacies to the problem of optimal patent design.

Scotchmer identified the main challenge, which has to do with the fact that without the groundbreaking innovations on which they build, follow-on inventions could not be made. Some of the profit generated by follow-on inventions is therefore attributable to the foundational work done by the groundbreaking innovator. To provide the appropriate amount of encouragement to invent in the first place, then, the original inventor should be given some of that subsequent profit. Otherwise, original innovators would be under-rewarded for the social surplus they enable. The difficulty is in determining how to allocate profits optimally between the breakthrough invention and the ones that build on it so that all of them are adequately encouraged.

Another intricacy is that considering cumulative innovation necessarily introduces another policy lever (in addition to patent breadth and duration) that must be optimised: the minimum inventive step, *i.e.*, the matter of how "innovative" a follow-on invention must be in order to qualify for patent protection. There will be advantages and disadvantages no matter where the lever is set. A weak inventive step requirement has the benefit of encouraging the disclosure of even small technological advances. On the other hand, knowing that competitors can obtain patents on even minor improvements they may make to an innovation may persuade inventors to choose secrecy over patents. If a substantial inventive step is required, companies are encouraged to set loftier goals for their R&D programs, but smaller advances will not be disclosed. In any event, one thing scholars seem to agree on is that the optimal design of patent policy depends on how easy or difficult it is for patent holders to use licensing to rearrange and exercise their rights.[16]

The next sub-section turns to empirical studies to see what light they can shed on these issues.

2.2 Patents and innovation – empirical studies

There is no shortage of quantitative studies that analyse the relationship between patents and innovation. In fact, far too many have been conducted to permit a complete review of them here. What follows is a condensation of some of the most important and consistent findings in recent OECD research and the academic literature.

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15 Stephen Maurer & Suzanne Scotchmer, "The Independent Invention Defense in Intellectual Property," 69 Economica 535 (2002), available at http://ssrn.com/abstract=34710.

16 Gallini & Scotchmer, supra note 12 at 69.

2.2.1 General analyses of the relationship between patents and innovation

One hypothesis that could be formulated based on the surge in international patent activity during the last 15 years or so is that it was caused primarily by a surge in innovation. Several studies undermine that theory, though. For example, Professor Kortum's econometric analysis of patents issued by the European Patent Office (EPO) suggests that more than half of the growth in filings there during the 1990s is attributable to a decrease in fees. According to his model, almost two-thirds of the roughly six percent annual growth in European patents between 1991 and 2000 was caused by a decline in EPO application fees.[17] More studies that cast doubt on increased innovation as the reason behind the patent surge are discussed in section 2.2.2.2.

Harhoff, Scherer and Vopel ("HSV") tried to gain a better understanding of how patents motivate inventors by examining hundreds of patent holders' estimates of the value of German patents they had applied for in 1977. The authors found that the most valuable patents accounted for a large fraction of the total value of all observations. In other words, they found a skewed distribution of values in which most inventions have modest values but there is a long, low-frequency "tail" that extends through the very high value range of the data.[18] In fact, even when looking only at the patents that were renewed to the full allowable term, they found that the most valuable five percent of the patents accounted for 46 to 61 percent of the sample's total patent value (depending on whether the largest outlier was included or not). The authors concluded that such a skewed distribution indicates that investing in technological innovation is an intrinsically risky endeavour, even if it is profitable in an aggregate sense, because the odds of any given invention being in the high value range are small.[19]

That observation later led Scherer to write an article entitled "The Innovation Lottery."[20] Reflecting on the findings in the HSV study, Scherer was intrigued by the fact that they support an idea once expressed by Schumpeter, which is that innovators are motivated to innovate for essentially the same reason that people buy lottery tickets: they overestimate the probability of receiving an enormous monetary gain. This pattern of optimism extends to less technological and more artistic endeavours, as well. Scherer notes that the same phenomenon of spectacular rewards going to a relatively small number of creators applies in the motion picture and music industries.

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17 Jonathan Eaton, Samuel Kortum & Josh Lerner, "International Patenting and the European Patent Office: A Quantitative Assessment," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 48.

18 Dietmar Harhoff, Frederic Scherer & Katrin Vopel, "Exploring the Tail of Patented Invention Value Distributions," in Ove Granstrand (Ed.), Economics, Law and Intellectual Property: Seeking Strategies for Research and Teaching in a Developing Field (2003).

19 The HSV study's results are consistent with those of several other studies in that they all found skewed value distributions. See, e.g., Jean Lanjouw, Ariel Pakes & Jonathan Putnam, "How to Count Patents and Value Intellectual Property: Uses of Patent Renewal and Application Data," 46 Journal of Industrial Economics 405 (1998) (finding that within four technology groups, the most valuable five percent of German patents accounted for 22 to 31% of the total patent value in those groups); F.M. Scherer, "The Size Distribution of Profits from Innovation," 49/50 Annales d'Économie et de Statistique 495 (1998). However, the sheer magnitudes of the values in the tail portion of HSV's results are much higher than those in other studies. This is probably because HSV examined the counterfactual question of how costly it would have been to be deprived of an invention's use, instead of how much it would cost to allow the invention to lapse into the public domain. Harhoff, et al., supra note 18 at 302.

20 F.M. Scherer, "The Innovation Lottery," in Rochelle Dreyfuss, Diane Zimmerman & Harry First (eds.), Expanding the Boundaries of Intellectual Property (2001).

An interesting question is whether this skewed value distribution is better at motivating inventors and creators than one that simply grants rewards in proportion to the investments made. Rigorously proving or disproving an answer to that question turns out to be difficult, Scherer concedes. He is willing, however, to go so far as to offer the hypothesis that the answer is yes, based on theories about why people are willing to make bets with very small probabilities of winning huge returns. If he is correct that those theories are applicable to innovators as well as gamblers, what does that mean for policymakers?[21]

It means, Scherer contends, that there is a role for strong patent rights in facilitating and protecting the occasional huge windfall, thereby encouraging innovation by those who like long odds and big rewards. It also means that patent rights should not be revoked just because the owner has made what is perceived to be too much money from an invention. There must be a chance of reaping a great reward to make the "long shot" incentive system work. That is not to say that patent rights should never be weakened under any circumstances, though. Scherer notes, among other reasons, that not all innovators are motivated by patents or the lottery-like incentive system they have helped to create.[22]

Indeed, there is sound empirical evidence that the availability of patents is an important factor in firms' decisions to invest in R&D only in certain industries. For example, several surveys demonstrate the important role that patents play in the American chemical and pharmaceutical industries.[23] Those same surveys also show, however, that in many other industries patents are not considered to be very effective in protecting innovations. Other studies of the effects of patents on innovation reach ambiguous results. Patents promote innovation in some situations but not all, and in some cases they appear to be detrimental.

A widely-cited paper by Cohen, Nelson, and Walsh (CNW) provides a good illustration of those points.[24] The authors conducted a survey of nearly 1500 R&D labs in the US manufacturing sector. They found that firms usually rely on a variety of methods to protect the returns from their innovations, including secrecy and lead time advantages as well as patents and other mechanisms. But the majority of firms tended to use patents the least among the various methods, whereas secrecy and lead time were used most heavily.[25] In fact, the authors concluded with respect to product innovations that "patents are unambiguously the least central of the major appropriability mechanisms overall" and that "in no industry are patents identified as the most effective appropriability mechanism."[26] Data were collected in 34 industries in the CNW study.

A handful of industries, however, reported greater patent effectiveness (at least 40 percent of respondents considered patents effective for protecting their innovations) concerning product innovations. These included medical equipment, drugs, special purpose machinery, computers, and automobile parts. Even that group's ratings for patent effectiveness all slip below the 40 percent mark for process

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21 Scherer gives two caveats before delving into the policy implications. First, he reminds us that not every innovation comes about primarily because of the profit motive. Second, even when their work leads to a major financial success, the inventors and R&D managers who work for corporations typically do not receive substantial shares of the total profit. In fact, among established corporations, risk aversion rather than risk seeking is probably the prevailing approach. Scherer, supra note 20 at 20.

22 Id.

23 See Richard Levin, Alan Klevorick, Richard Nelson & Sidney Winter, "Appropriating the Returns From Industrial Research and Development," 3 Brookings Papers on Economic Activity 783 (1987); Wesley Cohen, Richard Nelson & John Walsh, "Protecting Their Intellectual Assets: Appropriability Condition and Why US Manufacturing Firms Patent (Or Not)," NBER Working Paper No. 7552 (2000).

24 Cohen, et al., supra note 23.

25 See Section 2.5 for more on alternatives to patents.

26 Cohen, et al., supra note 23 at 9.

innovations, though, and the overall rating for patents on process innovations across all industries is even lower than the rating with respect to product innovations is.[27]

One question that arises in light of CNW's findings is why more and more patents are being sought if they are not helping most firms to protect their innovation returns. The authors were curious about that, too, so they included questions about the motives for patenting in their survey. What they found is that firms can profit from owning patents in several ways, not just by profiting directly from commercialising or licensing the invention. Among the prevailing reasons for patenting were 1) blocking rivals from patenting related inventions; 2) protecting against infringement suits; and 3) using patents as leverage in negotiations over technology rights.[28]

Because patents appear to stimulate considerable innovation in some industries but do not do so in others, critics have complained about the largely one-size-fits-all approach of most patent regimes. Kahin states that "the patent system has expanded but not adapted. Affinity programs and reverse auctions are not treated differently from gene sequences and light-emitting diodes."[29] His main concern is that what works well in some industries may be hurting the performance of others.

2.2.2 The effect on innovation of post-1980 changes in patent regimes

Despite the lack of clear-cut evidence that a positive relationship between patents and innovation generally exists, policymakers seem to share a strong belief that one does. Such a belief has appeared frequently in policy statements in the United States, Japan and Europe, at least – and the patent offices in those countries grant approximately 84 percent of all patents worldwide.[30] The Japanese government recently adopted the motto "*chizai rikkoku*," or "IP-based nation," while introducing a series of reforms aimed at strengthening patent rights.[31] In 2001, the European Patent Office adopted the mission statement "to support innovation, competitiveness, and economic growth."[32] In the US, meanwhile, a PTO official characterised the growth in patent applications as "a boon for America's economy, as well as contributing to our genius for innovation."[33] In a document prepared for an OECD conference, another PTO official wrote that "[t]he US government believes that strong patent systems . . . encourage research and development and are catalysts for new technologies and industries," and that one of the US government's objectives was to "[s]trengthen and expand intellectual property rights globally, moving forward from the level achieved so far, which is already quite satisfactory."[34]

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27 Id. at 10 and Tables 1 and 2.

28 Cohen, et al., supra note 23 at 16-24.

29 Kahin, supra note 11 at 218.

30 Catalina Martinez & Dominique Guellec, "Overview of Recent Changes and Comparison of Patent Regimes in the United States, Japan and Europe," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 131.

31 Ichiro Nakayama, "Intellectual Property Strategy in Japan: Towards an 'IP-Based Nation'" in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 302-03.

32 Manuel Desantes, "The Patent System: Current and Future Challenges," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 310.

33 James Rogan, Director of the US PTO, Prepared Remarks for the US FTC/DOJ Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy (6 February 2002), available at www.ftc.gov/opp/intellect/rogan.htm (quoted in Martinez & Guellec, supra note 30 at 131).

34 Lois Boland, "The Patent System: Current and Future Policy Challenges," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004) at 316.

Box 1. The Problem of Measuring Innovation

By casting doubt on innovation as the main reason for patenting, Kortum's results suggest that raw patent data is an imperfect proxy for innovation. A less than 1:1 correlation between the number of patents issued and actual innovation should not be surprising, though. It is known that firms seek patents under many circumstances, rather than only when they wish to protect a newly developed technology from imitation and exploit it commercially. For example, many large companies build up their patent portfolios for the purpose of gaining leverage in licensing or settlement negotiations. Alternatively, companies may pursue patents in an effort to block their competitors' development activities. Start-up companies may try to get as many patents as possible because patents can help to persuade venture capitalists to fund young firms. Furthermore, it is also known that patents are not always the method of choice when the main objective is protection from imitation. In some industries, companies may prefer to rely on secrecy or lead time to maximise their returns from innovation. Finally, studies have shown that patent values are highly skewed, with a substantial portion of them having little or no commercial worth. Consequently, using the number of patents granted as an indicator of innovation may result in either overestimates or underestimates.

R&D spending and R&D spending as a percentage of firm sales ("R&D intensity") are also frequently used as proxies for innovation. But those are imperfect substitutes, as well, because not all R&D spending leads to innovation. The rate at which R&D translates into successful innovations varies from industry to industry and from firm to firm, for instance. In addition, several firms may engage in the same R&D simultaneously, generating redundant R&D expenditures. On the other hand, some innovation takes place with little or no R&D spending at all, or at least it may not be recorded that way in an accounting sense. For example, investment in innovation might include activities such as the acquisition of high-tech equipment, training or product testing. According to some estimates, the share of such activities in overall innovation spending is greater than half in the services sector, where changes in process, organisation and marketing represent a larger than average proportion of innovation.[*]

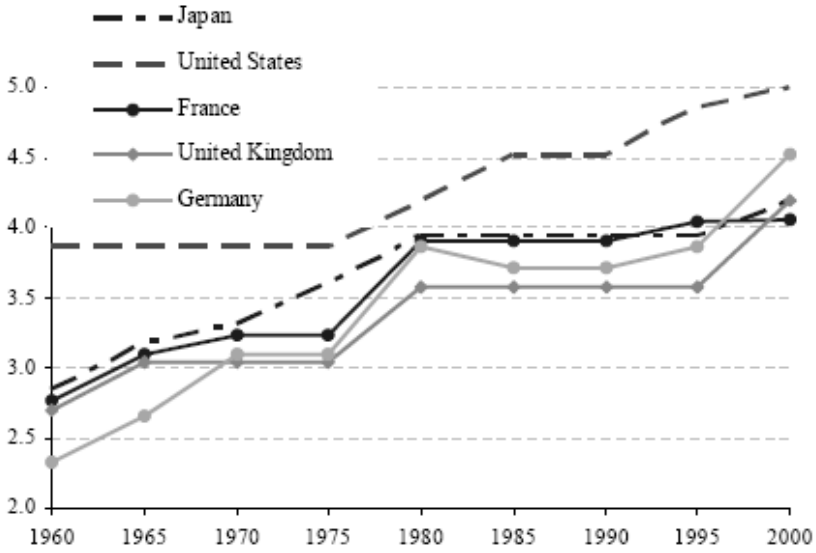
As with patent data, therefore, using R&D spending or R&D intensity as indicators of innovation may result in either overestimates or underestimates. As imperfect as data on patents and R&D are as surrogates for innovation, both are nevertheless widely used because it is so hard to measure innovation directly and there seem to be no better alternatives.

[*] OECD, Going for Growth (2006).

The conviction that patents are good for innovation has helped to bring about important changes in patent regimes during the past 25 years or so. Most of the changes have made the regimes stronger by reinforcing the exclusive rights conferred to patent holders and by expanding the intellectual territory that patents can cover. (See Figure 1.) Harmonisation among OECD countries has increased as they have generally accepted the view that easily enforceable patents and broader rights for patent holders are beneficial for innovation.[35]

[35] Martinez & Guellec, supra note 30.

Figure 1. Patent Strength Index, 1960-2000



Source: Martinez & Guellec, *supra* note 30 at 132. Index values range from 0 to 5, with 5 indicating the highest level of patent strength.

The adjustments made to various countries' patent systems have provided an opportunity to test the relationship between patents and innovation by looking at changes in innovative activity that have occurred since the new policies were implemented.

The policy changes

In general, patent rights have been broadened and strengthened as follows:[36]

- *Coverage has expanded into new fields.* Areas that were previously outside the boundaries of patentability are now increasingly protected, notably service-related inventions such as software and business methods. Patents are also being issued more frequently for basic research technologies, especially in the field of biotechnology.

- *The scope of individual patents, especially those granted in new areas, has increased.* Patent claims in new fields are often broader than those in mature fields. Pioneering inventions in emerging technology areas tend to be larger in scope than follow-on inventions. Some patenting practices such as the use of "reach-through claims" in biotechnology can extend protection to a broad range of applications unknown at the time of patenting.[37] In addition, the adoption of the doctrine of equivalents in infringement litigation may have contributed to the broadening of patent scope in some countries. Under that doctrine, an invention that performs the same function, in the same way, with the same result, as a patented invention, would be judged to infringe, notwithstanding any literal differences with what is claimed in the patent. The doctrine of equivalents has been adopted across Europe, in Japan and in the United States.

36 This summary of changes is based on Martinez & Guellec, supra note 30 at 128-29.

37 Reach-through licensing agreements assess royalties based on the revenue generated by a downstream product, regardless of whether it is made using the licensed technology. For more detail on reach-through licensing arrangements in the biotechnology sector, see OECD, DAF/COMP(2004)24, Intellectual Property, Background Note 34-36.

- *Patent rights are upheld more frequently and are judged to be more valuable in courts.* Patent holders are winning more often and are receiving higher damage awards in infringement trials across OECD countries. Since the creation of the Court of Appeals for the Federal Circuit (CAFC) in 1982, the number of patents invalidated in courts has decreased in the United States.

- *Research exemptions are being curtailed*. Recent court decisions in the United States are restricting the applicability of research exemptions to infringement claims. Most countries' patent systems recognise an exception to liability for patent infringement for uses of patented inventions that are for "experimental" or "research" purposes. Some courts have adopted a narrow interpretation of the exemption, and the CAFC has ruled that it covers only "actions performed for amusement, to satisfy idle curiosity, or for strictly philosophical inquiry."[38]

In the United States, a series of judicial, legislative, and administrative actions and international agreements beginning in 1980 extended patenting to upstream technologies (mainly biotechnology) and other fields that were previously ineligible for IP protection (software and business methods). Another development was the establishment of a special federal court (the CAFC) in 1982 that hears appeals concerning patent infringement. The creation of the CAFC is commonly considered to be one of the most important changes in the US patent regime in recent years.[39] A number of the court's decisions have expanded the definition of what is patentable. CAFC decisions have also bolstered the strength of patent holders' rights by reducing the incidence of patent invalidation and raising the financial awards available in infringement cases.

Other changes in the US strengthened the position of patent holders against potential infringers and encouraged universities to begin using the patent system. The passage of the Bayh-Dole Act allowed universities to obtain patents on federally funded inventions, and some universities have been aggressive about enforcing those new rights. In the past, some of the new technology they are creating would have come under the heading of "basic research" rather than "patentable inventions." This new crop of patents has heightened concerns about the development of an anti-commons, especially since so much university R&D focuses on creating upstream research tools that other inventors need.

Pro-patent reforms were also implemented in Japan, mostly beginning in the late 1980s. They resulted in a) the expansion of patentable subject matter, such as the introduction of gene-related patents and software patents; b) an increase in the number of claims allowed in each patent; c) higher incentives for university patenting and licensing, and d) strengthening of patent rights, such as increasing the damages awarded in litigated infringement cases and limiting the incidence of compulsory licensing.[40]

Japan also took steps to create more specialised courts that deal with IPR cases. Between 1997 and 2002, Japan increased the number of courts, judges and court investigators focused on IP at the Tokyo High Court, Tokyo District Court and Osaka District Court.[41]

The momentum of these reforms continued when the government published a document called the Strategic Framework for Intellectual Property Policy in June 2003. The Framework's purpose is to

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38 Madey v. Duke University, 307 F.3d 1351, 1362 (Fed. Cir. 2002).

39 See, e.g., Jaffe & Lerner, supra note 5 (calling the creation of the CAFC one of "the most profound changes in US patent policy and practice since 1836").

40 For more details on the Japanese reforms, see Kazuyuki Motohashi, "Japan's Patent System and Business Innovation: Reassessing Pro-Patent Policies," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

41 Martinez & Guellec, supra note 30 at 136.

enhance industrial competitiveness by promoting the creation, utilisation, and strengthening of IP. Key elements include measures to grant and protect IP in new fields such as biotechnology and information technology. Furthermore, the government adopted the motto "*chizai rikkoku*" (IP-based nation).[42]

Kazuyuki Motohashi asserts that much of the impetus behind the changes in the Japanese approach came from the belief that pro-patent policies were largely responsible for the revitalisation of American competitiveness in the 1980s.[43] In fact, the rationale behind most of the pro-patent reforms in OECD countries seems to have been that strong patent regimes supposedly bring strong economic benefits in terms of attracting foreign direct investment, raising incentives to invest in R&D, and boosting innovation. An OECD report concluded, however, that "pro-patent policies have been put in place without much regard to their effects on competition or the diffusion of knowledge, which are important questions and deserve further research."[44]

The policy changes' effects on innovation

A number of scholars have conducted empirical analyses to help shed light on the effects that patent strengthening measures have had. High rates of innovation since the changes began to be introduced would arguably be evidence of a positive relationship between stronger patent rights and greater innovation. There is surprisingly little evidence, however, that the benefits of more and stronger patents extend beyond a few industries, such as pharmaceuticals, chemicals, and medical devices. Meanwhile, concerns and criticisms about how the patent system is functioning appear to be growing.

One study based on panel regressions of data for 20 OECD countries over the 20-year period from 1982 to 2001 concluded that stronger IPRs contribute to a significant increase in the number of patents granted, but have little direct impact on R&D expenditures. An increase of one unit in the model's IPR index (roughly equivalent to the actual changes that took place during the sample period in many countries) was associated with an increase of just over five percent in R&D spending, but it was estimated to raise the total number of patents by over 30 percent.[45] In fact, stronger IPRs seemed to *reduce* R&D spending in some circumstances:

> The main conclusion that emerges from the empirical estimates is that it is difficult to find a well-determined and robust effect from the IPR index on R&D intensity once allowance is made for other explanatory factors . . . . There is some evidence that higher levels of IPRs have a significant negative effect on R&D when import penetration is high, possibly because strong IP protection is preventing the full benefits of competition from being felt, but little direct evidence that it matters in its own right.[46]

Studies that focus on particular industries have also questioned the link between expanded patent rights and innovation. An empirical study by James Bessen and Robert Hunt, for example, undermines the claim that making software patentable raises the incentive to innovate. Overall, the study finds that there is

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42 Nakayama, supra note 31 at 302-03.

43 Motohashi, supra note 40 at 54.

44 OECD, Patents, Innovation and Economic Performance, OECD Conference Proceedings, at p. 14 (2004).

45 Florence Jaumotte & Nigel Pain, "From Ideas to Development: The Determinants of R&D and Patenting," OECD, ECO/WKP(2005)44, Economics Department Working Paper no. 457 at 49 (2005).

46 Id. at 20; see also Jaumotte & Pain, supra note 2 at 40.

not a close relationship between software patents and the creation of computer programs. In fact, the data show that the vast majority of software patents are obtained by firms that are not in the software industry.[47]

Bessen and Hunt acknowledge that after the US Patent and Trademark Office (PTO) revised its guidelines for computer related inventions in the mid-1990s, making it easier to obtain software patents, the number of such patents rose dramatically. But in this case, they assert, raw patent figures do not tell the real story on innovation. To unravel the truth, the authors began by looking at who was receiving software patents. They learned that the median company in a ranking arranged by the number of software patents held has twice the market value of the median patentee for other types of inventions. In other words, software patentees are relatively large companies. Next, they discovered that between 1994 and 1997, firms in the software industry received only seven percent of all software patents granted in the US. That surprising statistic was followed by another: three out of every four software patents was awarded to a manufacturing company.[48]

The authors then tried to get a sense of whether these software-patenting manufacturers were actually innovating. They determined that machinery, electronics and instruments manufacturers employed only six percent of all computer programmers in the US, yet they accounted for two of every three software patents being granted. Meanwhile, 90 percent of programmers were employed outside the manufacturing sector, but altogether they were getting only one 25 percent of the software patents. Accordingly, Besson and Hunt had the impression that software patents reflected something other than software creation.[49]

Digging further, the authors began to consider the propensity to patent in various industries. That is, they considered the average number of patents obtained for a given amount of money spent on R&D. They learned that manufacturing firms have much higher propensities to patent than software firms. Specifically, machinery, electronics and instruments companies receive between four and ten times more patents at any given level of R&D than software companies receive. Thus, it seems that the industry in which a firm operates has much more to do with software patenting than R&D does. But why?

Bessen and Hunt believe the answer has something to do with the fact that in the 1990s, holding all else equal, the larger the share of a firm's new patents that were for software, the lower the firm's R&D intensity was. In other words, the more a firm focused on getting software patents, the *less* it spent on developing new products and processes. This anomaly can be explained by the kind of strategic patenting behaviour that may occur in patent thickets. Specifically, when software became patentable, it opened up a new frontier on which firms that were already engaged in portfolio leveraging could fortify their bargaining positions. Those firms typically were not software firms, but rather they tended to be manufacturing firms, and they may have been adding software patents to their collections for the purposes of intimidating potential entrants, making competitors pay royalties, and defending themselves from infringement lawsuits. Competition can occur on the basis of patents rather than inventions when firms use similar technologies and it is relatively inexpensive to amass a large patent portfolio. In that kind of an environment, firms could compete to tax each others' inventions. That naturally tends to reduce the rivals' incentives to engage in R&D.

In any event, given the huge growth in software patents in the late 1990s, the economy-wide impact on R&D due to the decision to allow software to be patented was substantial. Bessen and Hunt's findings, if taken literally, imply that even if the number of software patents had only grown at the same rate as all

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47 James Bessen & Robert Hunt, "The Software Patent Experiment," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

48 Id. at 250-51.

49 Id. at 251-52.

other patents after 1991, average R&D intensity among US firms would have been roughly seven percent higher in 1997. That translates into about US $9 billion in private R&D spending that never occurred.[50] That figure would be even higher if we assumed that patents for software had never been permitted in the US It is worth repeating, however, that this is a very literal extension of Bessen and Hunt's findings.

Software is not the only field in which firms collect patents for the purpose of bulking up their patent portfolios so that they have more to bring to the negotiating table. In 2001, Hall and Ziedonis found the same pattern occurring in the semiconductor field, where the patenting rate doubled in the course of ten years. The authors determined that this increase reflected efforts by companies to put large patent portfolios together for the purpose of preventing or delaying innovation-blocking (or "hold-up") strategies by rivals that owned other technology necessary for manufacturing semiconductor chips.[51]

Motohashi finds it ironic that pro-patent reforms in Japan were at least partially motivated by a belief that similar reforms had helped to spark innovation in the US As he rightly observes, even within the United States opinions are divided as to whether policies that expand and strengthen patent rights have any appreciable effects on business innovation, and many empirical studies show that pro-patent policies have had only marginal effects on business innovation.[52]

Motohashi also conducted a study of his own, assessing the impact of Japanese patent reforms on innovation activity by using statistical data, firm-level survey data and information from interviews with IP managers in information technology and pharmaceutical firms. He finds that the measures implemented for the purpose of strengthening patent rights, such as raising the amount of compensation awarded in patent infringement litigation, were not perceived by firms as having a significant impact on their innovative activity.[53] While it is true that there was substantial growth in the number of Japanese patents awarded in the late 1990s, one cannot infer that this growth reflects a similarly substantial increase in innovation because overall patent growth by itself does not tell the whole story. When the data was grouped by industry, a great deal of the increase was attributable to biotechnology and software, both of which are fields that were newly eligible for patent protection in Japan. This suggests that the rise in patenting was not due to greater innovation so much as it was due to the new possibility of obtaining patents on innovations that were already taking place anyway. In fact, Motohashi notes that extending the scope of patent protection to include new sectors appears to have had a stronger effect on the number of patent filings than patent-strengthening policies such as increased damage claim amounts.[54]

Motohashi backs up his conclusion by describing the results of a series of interviews with Japanese IT companies. The interviews show that the only policy change that had a significant effect on their patenting activity was the expansion of patentability into new areas, such as software and business methods. R&D activity – another imperfect but useful indicator of innovation – was not substantially affected by patent-

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50 Id. at 255.

51 Bronwyn Hall & Rosemarie Ziedonis, "The Determinants of Patenting in the U. S. Semiconductor Industry, 1980-1994," 32 Rand Journal of Economics 101 (2001).

52 Motohashi, supra note 40 at 54 (citing Samuel Kortum & Josh Lerner, "What Is Behind the Recent Surge in Patenting?", 28 Research Policy 1 (1999); Bronwyn Hall & Rosemary Ziedonis, "An Empirical Study of Patenting in the US Semiconductor Industry, 1979-1995," 32 Rand Journal of Economics 101 (2001); Josh Lerner, "Patent Protection and Innovation Over 150 Years," NBER Working Paper Series, no. 8977 (2002).

53 Motohashi, supra note 40.

54 Id. at 61.

strengthening policies, either. In fact, not a single firm indicated that its R&D spending was stimulated by such measures.[55]

The one bit of good news in the Motohashi study for fortified patent rights is that they do not appear to have created an anti-commons problem in the Japanese pharmaceuticals sector. That sector is believed to be among the most vulnerable to developing such a problem because it is heavily dependent on patented upstream research tools that facilitate the discovery and effectiveness of downstream products. The Japanese pharmaceutical companies indicated that even though licensing costs were rising because more patents are being granted for upstream technologies, this has not led to any changes in their R&D strategies yet. Nevertheless, many firms apparently reported concerns that an anti-commons problem might eventually arise because it is now possible to obtain patents on research tools and genes that were previously not patentable.[56]

2.3 The "Reformist" View

Not surprisingly, the apparent failure of stronger patent rights to deliver more innovation to society has prompted some scholars to call for a policy shift. Lemley, for example, takes the view that when governments strengthened patent rights in recent years, they lost sight of the fact that patents were originally conceived as a limited exception to what was supposed to be the prevailing paradigm: competition. Courts, legislatures, and some commentators began to see IPR itself as a good.[57] Having concluded that a certain amount of IP protection is helpful because it encourages innovation, they reasoned that more would be even better. Eventually, Lemley argues, they came to hold the view that inventors will not have adequate incentives to create unless they are entitled to capture the entire social value of their inventions. Absolute protection therefore became their objective.

Lemley argues that efforts to allow inventors to retain the full social value of inventions are misguided. He contends that the rhetoric of free riding[58] that often accompanies those efforts is based on a false premise, namely that intellectual property is no different from real property.[59] The traditional concern about free riding is that real property owners will not invest the optimal amount in their property if others can free ride on the owners' investments. Carrying that logic over to IP, the fear is that if free riding is tolerated, it will deter inventors from investing the optimal amount in creating new inventions. It is a generally accepted observation that the social value of innovation is greater than the private value. Therefore, those in favour of stronger patents argue that too much free riding on innovators' investments must be taking place, which means that IPRs are not yet strong enough.

For much of its history, IP law allowed many opportunities for free riding. There were limits on what could be protected and on the duration of that protection, as well as exceptions for certain kinds of uses.

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55 Id. at 69.

56 Id. at 72, 76.

57 Mark Lemley, "Property, Intellectual Property, and Free Riding," 82 Texas Law Review1031 (2005).

58 To engage in free riding is to use the fruits of an investment without having to share its costs.

59 The idea that IP and real property are essentially the same is also rejected by James Langenfeld in his article James Langenfeld, "Intellectual Property and Antitrust: Steps Toward Striking a Balance," 52 Case Western Reserve Law Review 93-99 (2001); see also Richard Gilbert & Willard Tom, "Is Innovation King at the Antitrust Agencies? The Intellectual Guidelines Five Years Later," 69 Antitrust Law Journal 43, 47 n.8 (2001); but see US DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property section 2.0 ("for the purpose of antitrust analysis, the Agencies regard intellectual property as being essentially comparable to any other form of property"); Richard Gilbert, "New Antitrust Laws for the 'New Economy?'" Testimony before the Antitrust Modernization Committee at 9 (8 November 2005) (supporting the same view).

The goal of eliminating free riding, however, is incompatible with such loopholes. Consequently, courts that accepted the real property view of IP decided to fight what they perceived to be free riding and they curtailed or eliminated many of those loopholes during the last 30 years. As a result, IPRs expanded dramatically.

Lemley contends that "[t]he assumption that intellectual property owners should be entitled to capture the full social surplus of their inventions runs counter to our economic intuitions in every other segment of the economy."[60] In a market system, he explains, it is considered optimal if sellers make just enough money to cover their costs, including a reasonable profit. If some consumers would be willing to pay more than the market price for a good or if others benefit from the fact that the goods are produced, then the market system is performing well. After all, if society wanted all producers to be able to fully internalise the positive externalities associated with their products, then there would be no competition agencies, but rather "monopoly agencies" or "cartel agencies," since those are the market structures that governments would promote. Even real property law, Lemley notes, does not permit owners to capture all positive externalities. He illustrates his point with the example of planting beautiful flowers in a home's garden. Although people passing by the home can enjoy the sight of those flowers, the owner cannot capture the value of that enjoyment by making them pay for it. Furthermore, positive externalities are ubiquitous, so we could not internalise them all even if we wanted to. Lemley concludes that "if free riding means merely obtaining a benefit from another's investment, the law does not, cannot, and should not prohibit it. If the marginal social cost of benefiting from a use is zero, prohibiting that use imposes unnecessary social costs."[61]

At this stage of his argument, Lemley seems to have overstated his case. He appears to be taking a purely static view of incentives and efficiency while ignoring dynamic effects. In other words, it looks like he is disregarding the fact that if others can simply copy whatever an inventor creates and sell it themselves, then inventors will be less motivated to invent anything in the first place. In a dynamic sense, that would definitely qualify as a "social cost of benefiting from a use." But while Lemley does not believe that free riding should be entirely eliminated, he also does not believe that it should be entirely tolerated, either. He is well aware of the importance of dynamic effects and incentives, and he therefore appreciates that inventors need to be able to make a profit from their inventions. The question is how much profit: just enough to cover costs, the full social surplus value of the inventions, or something in between?

Langenfeld easily but forcefully undercuts the case for giving inventors the full social surplus value of their inventions by pointing out that if innovators were allowed to retain all of society's surplus from their innovations, there would be no benefit to the rest of society from any innovations. Therefore, innovation would not push the economy forward towards greater productivity, but would only enrich the inventors.[62] Lemley agrees and takes the position that IP law should ensure that inventors are able to charge prices high enough to recoup their average total costs. Nothing in economic theory justifies more than that, he asserts. Actually, even today's strengthened IP laws cannot *ensure* even that amount, let alone anything more. There simply is no guarantee that a patented product or process will be worth anything in the market's eyes, so inventors will always face a risk that they will never recoup their costs. Lemley's point, however, is that a system that fosters cost recovery is adequate, so there is no need to implement policies that encourage greater compensation. It seems natural to ask, then, who will ever bother inventing if the only prize is cost recovery? And wouldn't greater rewards stimulate greater innovation?

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60 Lemley, supra note 8 at 1046.

61 Id. at 1049.

62 Langenfeld, supra note 59 at 96-97.

Fortunately, the answers to those questions seem to be in the data. As we have seen, except for a few industries, patents are not a primary motivator for inventors and strengthened patent laws have not stimulated greater innovation insofar as we can tell. Furthermore, as long as there is at least a small group of inventions that earn fabulous returns, inventors seem to be happy to continue striving to beat the odds and join that privileged company, even though most of them will recover no more than their costs, if that. The data, in other words, appear to support Lemley. Moreover, as we have also seen, there are definitely some costs associated with having stronger patent rights. His message that IPRs are justified only up to the point at which they create incentives to invent – and that full social surplus is well beyond that point – appears to be well-founded.

2.4 Opportunities for competition and patent officials to coordinate efforts on improving the patent system

Various experts have proposed a wide range of measures that would help to ensure that patents provide incentives to innovate while facilitating the diffusion of technological advances. Many focus on the need to improve patent "quality," by which they mean that patent applications should be subjected to more rigorous scrutiny at patent offices to make certain that they meet the statutory standards for patentability and patent scope. Particular suggestions include raising the budgets of patent offices so that they can hire more examiners, taking advantage of the knowledge that companies and private researchers have by giving them more opportunities to initiate post-grant challenges, and improving international coordination.[63] But what can competition agencies do to help?

That question came up in a 2004 roundtable that focused on biotechnology, but the suggestions were relevant to patent systems in general. For several reasons, such as a lack of relevant technical expertise and limited resources, it does not appear to be prudent for competition authorities to assume responsibilities related to the initial review of IP applications. Instead, delegates came up with a variety of ways for competition authorities to assist IP agencies in taking steps to improve the IP granting process themselves. The ideas included opening interdisciplinary dialogues with patent agencies to foster greater mutual understanding of each other's fields, commissioning expert reports that study a country's patenting system to determine whether and how it is causing any undue problems, and holding seminars or hearings in which academics, public and private sector practitioners, and industry participants come together to discuss problems and possible improvements to IP policies.[64] Some scholars have joined in the call for competition and patent officials to meet regularly to share information and views about whether patents are having desirable effects and how matters might be improved by easing or tightening patent examination policies and processes.[65]

There seems to be little reason to doubt that this is the correct approach for competition authorities to take. Though it may justly be questioned whether competition agencies have the expertise necessary to design and implement patent policy, it is clear enough that they can offer useful comments and suggestions. It is in society's interest that they do so because patent offices tend to focus on the interests of their clientele (patent holders and patent applicants), whereas competition agencies strive to improve the

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63 OECD, Patents, Innovation and Economic Performance, OECD Conference Proceedings (2004); US Federal Trade Commission, "To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy," (2003); Stephen Merrill, "Improving Patent Quality: Connecting Economic Research and Policy," in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004); Shapiro, supra note 4; Bronwyn Hall, Dietmar Harhoff, Stuart Graham & David Mowery, "Prospects for Improving US Patent Quality via Post-Grant Opposition," University of California, Berkeley, Competition Policy Center paper CPC03038 (2003); Jaffe & Lerner, supra note 5.

64 See OECD, DAF/COMP(2004)24, Intellectual Property, Executive Summary at p. 7.

65 See, e.g., Langenfeld, supra note 59 at 108.

welfare of all consumers.[66] Furthermore, several competition agencies have already demonstrated that they can make valuable contributions to the dialogue on how to improve patent systems.[67] The US Federal Trade Commission and Department of Justice, for example, held joint hearings on competition and patent policy a few years ago. The FTC report that followed contains concrete suggestions for improving patent quality and minimizing the anticompetitive impact of the patent system. The recommendations were directed toward Congress, the courts, and the PTO.[68] The FTC continued that effort by co-hosting a Patent Reform Conference and a series of "town meetings" in 2005.[69] The town meetings took place in various cities around the US and were held for the purpose of soliciting opinions from practitioners, inventors, and the general public on various proposals for patent reform.

A more direct way that competition agencies could act would be to use competition laws to reduce or eliminate the market power that occasionally arises from patents that never should have been granted according to the standards in IP laws. There are numerous examples in OECD countries of companies being compelled to license their IP as a result of the finding that they had violated a competition law.[70] But when a patent holder does not wish to license its technology to anyone, seeking to force the company to do so may not be the best approach a competition agency could take. As Shapiro points out,

> [w]hen a private party is granted a patent . . . giving the owner exclusive rights over certain intellectual property, and then antitrust rules are interpreted to require that these rights be licensed to others, public policy and the law are confused and contradictory. Apart from undermining precisely the exclusive rights that were granted, compulsory licensing raises the thorny issue of the *terms and conditions* on which such licenses must be granted . . . .
>
> From an economic perspective, imposing mandatory licensing on those whose innovations have the most significant economic effects makes little sense. Imposing mandatory licensing on patent holders who obtain a monopoly would undermine the rights of inventors whose innovations are the most valuable, as evidenced by their ability to transform an industry and, by dint of their superior technology, drive older technologies from the market. Innovation and competition are best promoted by carefully and properly defining the property rights awarded by the patent system, by taking steps to insure that such rights are only granted for true innovations, and then by letting patent holders assert those rights to exclude infringing rivals.[71]

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66 Shapiro, supra note 4 at 1022 & n.12.

67 See generally, OECD, DAF/COMP(2004)24, Intellectual Property.

68 US FTC, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (2003). The report is based on joint hearings held by the FTC and DOJ over a period of 24 days in 2002.

69 See Deborah Platt Majoras, Speech before the Patent Reform Conference, co-sponsored by the US FTC, the National Academies Board on Science, Technology and Economic Policy, and the American Intellectual Property Law Association (9 June 2005), available at www.ftc.gov/speeches/majoras/050609comppolicy.pdf.

70 See, e.g., Magill, C-241/91 P (E.C.J. 1995); In re Xerox Corp., 86 F.T.C. 364 (1975). Note that Xerox is somewhat of an anomaly in the US, and that the US antitrust agencies renounced mandatory licensing in the joint DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property 7 (1995).

71 Shapiro, supra note 4 at 1025-26 (emphasis in original).

Shapiro therefore concludes that it is far better to fix problems with the patent system by reforming the patent system, rather than by bending competition laws to that task. The Competition Committee has already expressed agreement with Shapiro on that point.[72]

2.5 Alternative ways to protect investments in innovation

We have seen that patents are not as popular in some innovative industries as they are in others, and that other methods for protecting investments in innovation are often used more frequently. This section reviews a few of the empirical studies that shed light on these issues.[73] There are several steps that can be taken to deter imitators besides filing for a patent. Among the options are secrecy, being first on the market, complexity, customer lock-in strategies, and frequent product renewals.

One reason that companies do not seek patent protection for their innovations is that they sometimes wish to avoid disclosing their innovations in a patent filing. The company might believe that when rivals learn about its new technology, it will be easy for them to think of legal ways to invent around the patent and quickly develop competitive technologies of their own. If the innovator does not have to announce and explain the innovation, however, its rivals might never realise that an innovation has occurred, and even if they do, it might take them a very long time to figure out how it works without the benefit of the patent filing. It is probably easier to keep process innovations secret than it is to keep product innovations secret, but it is possible in either case.

The advantages associated with being the first significant company to enter a new market ("first mover advantages") may be enough in some cases to enable an innovator to earn attractive returns on an invention, rendering patents unnecessary. A market with a reasonably-sloped, lengthy learning curve, for example, will enable the first mover to sustain substantial cost advantages over rivals that enter later. Being the first mover may also bestow a special reputation on a company that competitors can never achieve for themselves, therefore making customers willing to pay a price premium for the first mover's products.

When an invention is especially complex, rivals may not be able to imitate it even if they are legally allowed to do so. Alternatively, they might be able to determine what needs to be done to imitate the product or process, but doing it could be so expensive that undertaking the necessary work would not be worthwhile. In this situation, too, patent protection may be superfluous.

Customer lock-in strategies are straightforward: they keep customers coming back to the same supplier despite the presence of rivals. Frequent product renewals, on the other hand, do not lock customers in but keep them coming back anyway because the company regularly upgrades its product with a new and improved version.

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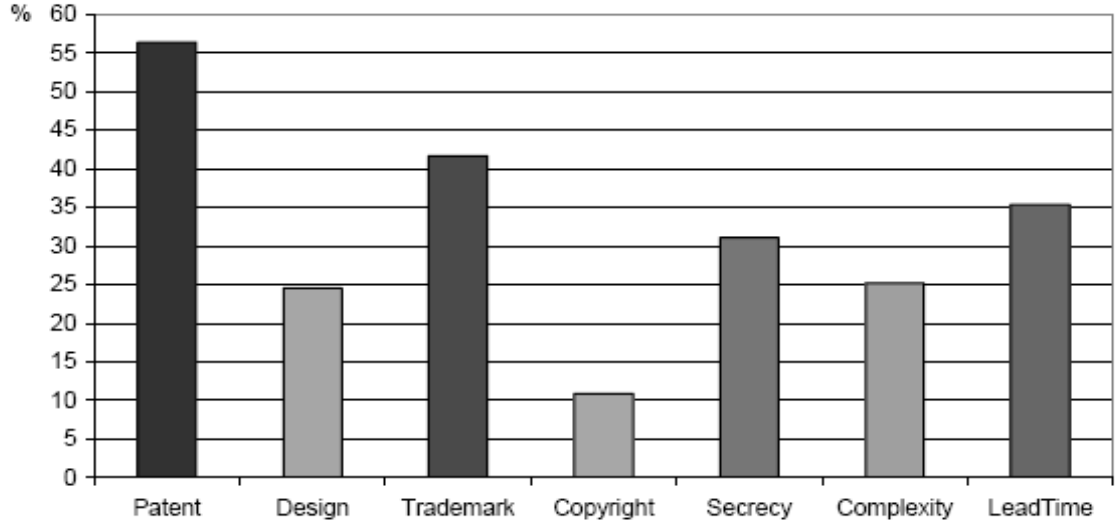
72 See OECD, DAF/COMP(2004)24, Intellectual Property, Executive Summary at p. 7 ("[I]n an 'easy patentability' environment, for example, competition agencies and courts tend to compensate by using competition laws to limit the negative effects of over-patenting. Because competition law is a relatively blunt instrument for that purpose, however, it would be preferable to fix the problems from within the patent system rather than from outside it").

73 In some industries, investments in innovation may be encouraged and protected by government subsidies, contracts, or monetary prizes. Those situations are not dealt with here. Instead, this paper deals with situations in which it is entirely up to each company to protect the fruits of its R&D from imitators and to make its inventions profitable. For information on government programs that procure innovation through contracts, prizes, and subsidies, see Gallini & Scotchmer, supra note 12.

Sometimes these patent alternatives can exist in combination with one another. For example, if a firm has developed a complex product, it may automatically enjoy first mover advantages while rivals try to figure out how to imitate it. Alternatively, the firm might feel well-insulated from imitation if its innovation requires specially trained personnel who work with proprietary equipment. In either case, the innovators will probably plan to develop other applications or improvements by the time competitors catch up with the first one.

Turning back to the empirical studies, a good one to begin with is by Mairesse and Mohnen, who recently examined the use of patents in comparison with other means of protecting and appropriating the value of innovations in France's manufacturing and services sectors.[74] Using data from the third Community Innovation Survey (CIS3), covering the period 1998-2000, the authors first grouped the data into three categories: high-tech manufacturing sectors, low-tech manufacturing sectors, and service sectors.[75] Considering only the firms that considered themselves to be innovating[76], one can see clear differences among the three groups not only with respect to their reliance on patents, but also in terms of their use of secrecy and lead time. (See Figures 2 - 4.)

Figure 2. High Tech Manufacturing



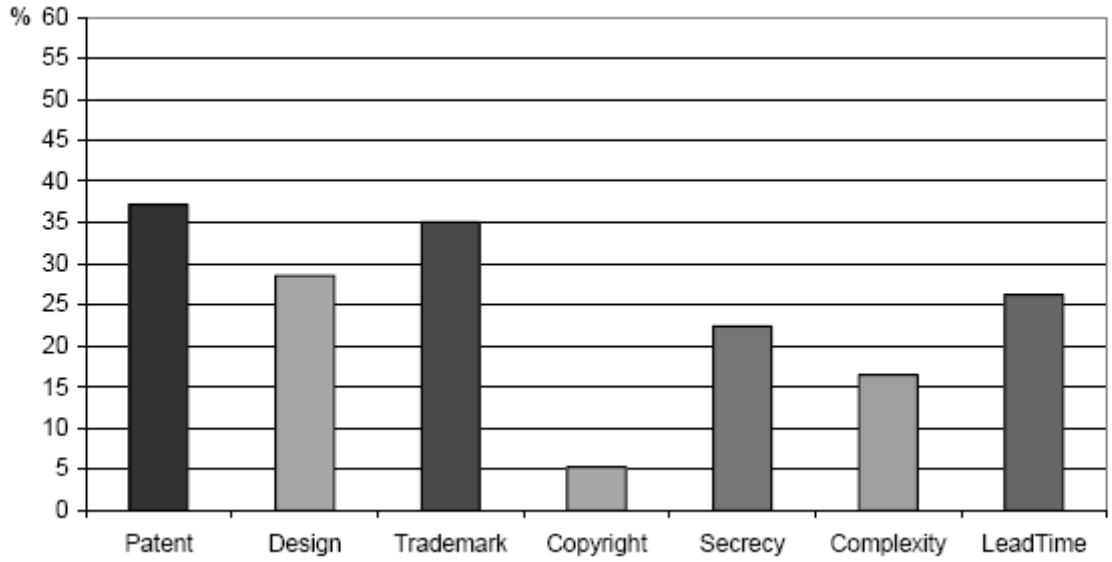
Source: Mairesse & Mohnen, *supra* note 74 at 239.

74 Jacques Mairesse & Pierre Mohnen, "Intellectual Property in Services: What Do We Learn from Innovation Surveys?" in OECD, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

75 The high-tech and low-tech manufacturing groups were defined on the basis of their R&D intensities. Id. at 230 n.4.

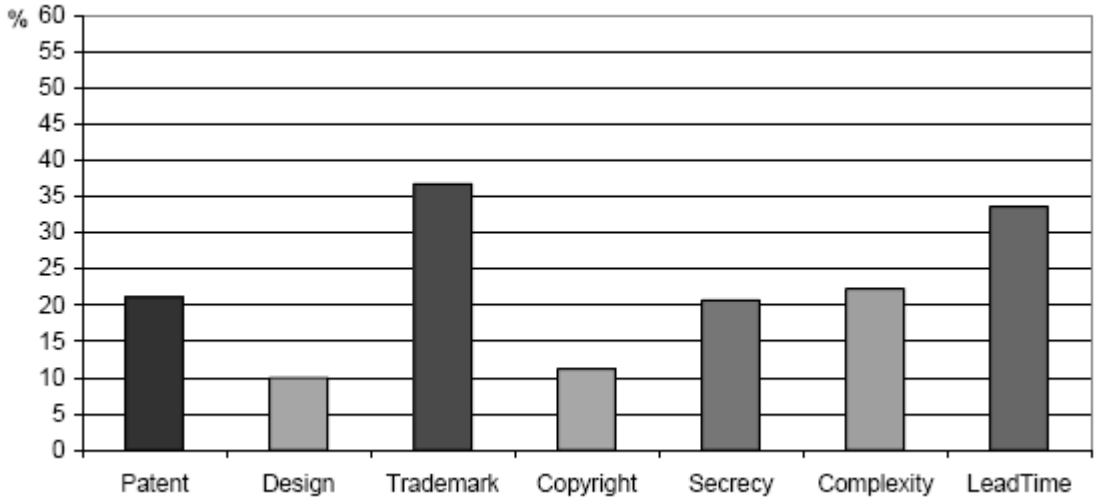
76 The innovating firms declared that they had introduced a new or significantly improved product, had implemented a new or significantly improved process, or had declared ongoing or abandoned innovation activities. Id. at 230.

Figure 3. Low Tech Manufacturing



Source: Mairesse & Mohnen, *supra* note 74 at 239.

Figure 4. Services



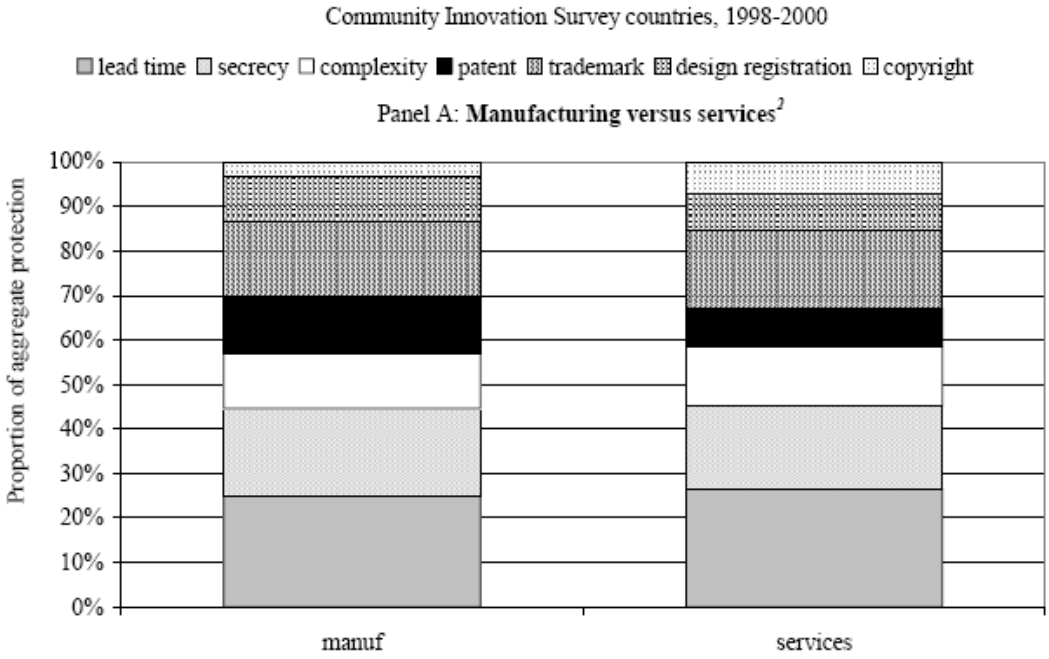
Source: Mairesse & Mohnen, *supra* note 74 at 240.

Patents are the protective measure of choice in the manufacturing sectors, but not in the service sectors, where firms rely more on trademarks, lead time, and complexity. Even in the two manufacturing groups, though, lead time is used by more than 25 percent of firms to protect their innovations. This suggests that substantial first mover advantages are not uncommon. Secrecy and complexity are also used considerably by high-tech manufacturing firms, and only the services companies use them as much as or more than they use patents.

Data aggregated from a larger subset of the countries in the CIS3 show a lower reliance on patents in comparison with other protective measures than the Mairesse and Mohnen study showed for France. (See

Figure 5.) In both the manufacturing and the services sectors, the use of patents as a means of protection is relatively small when compared with lead time, secrecy, and trademark usage. Note that the percentages in Figure 5 do not measure the same things as those in Figures 2 to 4. Nevertheless, the Figures are ordinally comparable even though they are not cardinally comparable.[77] In other words, we can clearly see that patents are not the most popular method relative to the others in Figure 5, whereas patents are the most popular method in Figures 2 and 3. We cannot, however, compare the magnitudes in Figure 5 with those in Figures 2 to 4.

Figure 5. Choice of Protection Method[1]



1) The proportion of a specific type of protection in aggregate protection is calculated as the ratio of the proportion of firms using this specific type of protection to the sum of the proportions of firms using the various types of protection. Firms can use different forms of protection.
2) The sectoral aggregates are calculated by taking a weighted average of the individual countries' observations for the sector and using as country weight the country's share in the total population of firms working in the sector in all included countries.

Source: Jaumotte & Pain, *supra* note 2 at 26.

The study of US manufacturing firms by Cohen, Nelson, and Walsh[78] that was mentioned earlier also shows a lower relative reliance on patents than Mairesse and Mohnen found with respect to French firms. The authors found that the majority of firms used patents the least among several possible methods for

77 Putting aside the fact that Figures 2 to 4 are based on data for France and Figure 5 is based on data for a larger group of countries, the height of the bars in Figure 5 are what would result if one divided the height of each bar in Figure 2 (or Figures 3 or 4), one at a time, by the total combined height of all the bars in that same Figure.

78 Cohen, et al., supra note 23.

protecting the returns from innovation, while they relied on secrecy and lead time the most. In fact, reliance upon secrecy was found to have increased dramatically between the early 1980s and 1994.[79]

The overall message of the empirical literature is that the relationship between the IP system, patenting and innovative activity is a complex one.

3. Competition and Innovation

As with patents and innovation, an academic dialogue concerning the relationship of competition and innovation has endured for many years. The discussion was initiated in the early 1940s by Joseph Schumpeter,[80] and it has produced two very different views about the effects of competition on innovation. What has come to be known as the Schumpeterian view is that big, dominant firms are more likely to innovate than smaller ones that lack market power, but also that innovations are "gales of creative destruction" that render market power ephemeral in high-innovation industries. The opposing view is that competition promotes more innovation because entrenched market power makes managers less inclined to spend money on developing new technologies, while firms facing greater competition have more to gain by innovating.

Competition agencies tend to adopt the latter view. Many complaints filed in merger cases predict that a merger deemed harmful to product market competition will probably decrease innovation, as well.[81] One of the key questions in this roundtable is whether the presumption that competition is better for innovation than monopoly is valid.

Section 3.1. shows that economic theory regarding the relationship between competition and innovation is ambiguous. When it is difficult for firms to appropriate the value of their innovations, theory predicts that competition will reduce innovation incentives. That suggests that in some cases allowing a merger (or some other type of conduct) that harms competition will actually increase innovation incentives. On the other hand, theory also indicates that more competition should boost innovation in many situations.

Unfortunately, real-world data do not resolve those conflicting theoretical forces, as the empirical literature also reaches mixed results. Basically, some of it says competition encourages innovation and some of it concludes that it reduces innovation, depending on various circumstances and assumptions.[82]

3.1 Theory

The intensity of product market competition affects innovation efforts. But the question of exactly how competition affects innovation is a conundrum that seems to have no universal solution. Instead, the answer requires a host of conditions, exceptions, and caveats. What does seem certain, at least, is that competition is capable of both promoting and deterring innovation. On the one hand, strong competition can encourage companies to innovate so as to keep up with, get ahead of, or remain ahead of their

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79 Id. at 3.

80 Joseph Schumpeter, Capitalism, Socialism and Democracy (1942).

81 For example, the US antitrust agencies included innovation effects as a reason to challenge more than one out of every three of the mergers they attempted to block between 2000 and 2003. Richard Gilbert, "Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?" in Adam Jaffe, Josh Lerner & Scott Stern (eds.), vol. 6 Innovation Policy and the Economy, NBER, at 3 (forthcoming).

82 An important point to bear in mind when considering these studies is that most of them are able to establish only that a correlation exists or that one does not exist. That is not the same as proving or disproving that competition causes greater (or less) innovation.

competitors. On the other hand, some degree of market power may stimulate innovation by making it easier to recover costs and earn profits. Policymakers are left with the unenviable task of creating an environment in which the rewards for innovation are sufficient to encourage it, but there are also competitive pressures that encourage firms to create, use and circulate innovations. Finding the optimal degree of competition is further complicated by the fact that innovation processes and the importance of patents (and other IPRs) in spurring innovation vary considerably across industry sectors and types of inventions. Section 3.2. takes a closer look at some of those real-world variations. First, it is useful to review what theoreticians have said about competition and innovation.[83]

3.1.1 Process Innovations

Economic theory has not produced a single, grand unifying model that explains the effect of competition on innovation in all situations. There is, instead, an assortment of specialised models. Among the oldest is Arrow's, which assumes complete and everlasting exclusive IP protection for inventors and deals only with process innovations. Arrow demonstrates that a pure monopolist operating in that environment has lower incentives to invest in process innovation than firms in a competitive market would have. The reason is that the monopolist is already enjoying a stream of supra-competitive profit that will continue even if it does not innovate. Although it is true that the monopolist could add to its profit by innovating, it will benefit only by an incremental amount. In contrast, a company operating in a competitive market would have no prior stream of supra-competitive profit, so if it developed the same new innovation, its resulting differential return would be greater than the monopolist's. Arrow thus concludes that under these conditions, the Schumpeterians are wrong because competition provides better incentives for innovation than monopoly does.[84]

What if we assume neither a pure monopoly nor a competitive market, but rather a market with a dominant firm and many smaller competitors? In this case, Arrow's result depends on whether the process innovation is "drastic" or not. A drastic innovation is one that reduces the marginal cost of production so much that even if the new inventor charges a monopoly price, that price will still be lower than the marginal cost of any firm using the older, less efficient process. Accordingly, if it develops a drastic innovation, the inventor will earn monopoly-level profits because no firm will be able to undercut its monopolistic price. This is true regardless of whether the inventor is the dominant firm or a smaller firm. However, because the dominant firm would only earn incremental monopoly profits from the innovation, whereas a smaller firm would suddenly earn the full measure of monopoly profits if it were the inventor, the smaller firm would have greater incentives to innovate than the dominant firm. Arrow's result is therefore still intact.

For a non-drastic innovation, however, a small firm's resulting profit will be constrained by competition from the dominant firm's older technology. In other words, the monopoly price based on the innovator's new marginal cost would exceed marginal cost pricing by the dominant firm. A pure monopolist, however, would not face that constraining competition. Does that mean that the Schumpeterian view is supported under these assumptions? Surprisingly, it does not, and the culprit is once again the fact that the monopolist would already be earning supra-competitive profits even with the old, higher-cost process. Arrow shows that after deducting those profits, the net return from innovation for the monopolist is lower than it would be for a smaller, competitive firm even if the process innovation is not drastic (provided that the smaller firm was earning no supra-competitive profit while using the old process).

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83 The discussion that follows is drawn in large part from Gilbert, supra note 81.

84 Kenneth Arrow, "Economic Welfare and the Allocation of Resources to Invention," in Richard Nelson (ed.), The Rate and Direction of Economic Activity (1962).

3.1.2 Product Innovations

The analysis gets a bit more complicated when we switch to product innovations. Because of product differentiation, even firms in competitive markets that are essentially price-takers can still earn some level of supra-competitive profit. They will therefore benefit only incrementally from any new product innovation they adopt, which will lower their incentive to develop one. Nevertheless, that effect will probably not be as pronounced as it would be for a pure monopolist, who would presumably have been earning even higher pre-innovation profits. Therefore, it is logical to expect that competitive firms should still have greater net incentives to invest in product innovations than monopolists. But there is a new element to consider with product innovations: A monopolist might be able earn more with the new product than a smaller competitor could earn if the competitor would have to sell the new product in competition with a dominant player. The monopolist might also be able to price discriminate more effectively than a non-dominant firm, which would also increase its profits. It is therefore impossible to reach the general conclusion that monopolists have lower incentives to invest in product innovations than non-monopolists. There is, in other words, no clear verdict on the Schumpeterian hypothesis.

If we assume that the product innovation makes the old product obsolete, however, then the competitor's gross benefit from innovation is no less than the monopolist's. Since the incremental profit effect faced by the competitor is less than that which a monopolist would face (*i.e.*, since the competitive firm stands to lose less profit to cannibalisation than a monopolist would), the competitor's net benefit from a drastic product innovation would be larger. Under this assumption then, the Schumpeterians fare poorly once again.

3.1.3 Simultaneous R&D

Arrow's model assumes that only one firm at a time can innovate. In the real world, though, firms can and do invest in innovation simultaneously. To allow for that possibility, Gilbert and Newbery developed a model in which a monopolist and an entrant invest concurrently in R&D with the objective of patenting a new technology.[85] The model assumes that whichever firm invests the most will get the patent. The patent is assumed to provide complete, permanent protection from competition in the new technology.

If the entrant wins the patent and the innovation is not drastic, then the entrant will have to compete with the monopolist. If the entrant does not win the patent, then its profit will be limited to the amount it can earn by competing with the old technology, which may be nothing. The most that the entrant would invest in getting the patent is the difference between its profit with the new technology and its profit without it. If the monopolist wins the patent, however, then it continues to be a monopolist and earns a monopoly profit. If it does not win the patent, then the monopolist becomes a duopolist using the old technology and earns a duopoly profit (again assuming the invention is not drastic). Therefore, under these assumptions it is the monopolist that stands to earn more profit from winning the patent than the entrant because if the monopolist wins, it can keep its monopoly profit, while the worst that will happen if it loses is that it will become a duopolist. Consequently, the monopolist has an incentive to invest more in winning the patent than the rival can afford, up to an amount equal to the present value of the stream of monopoly profits it could retain by pre-empting competition in this manner. The entrant, in contrast, cannot earn monopoly profits even if it wins the patent, as long as the innovation is not drastic. Gilbert & Newbery thus found a way to support Schumpeter's vision on theoretical grounds.

The outcome under the assumption that the innovation is drastic is refreshingly simple. In that case, the entrant is able to make as much profit with the new technology as the monopolist, so both firms will

[85] Richard Gilbert & David Newbery, "Preemptive Patenting and the Persistence of Monopoly," 72 American Economic Review 514 (1982).

have the same incentive to win the patent. As a result, the drastic innovation scenario does not support Schumpeter's view.

Things become complex again, however, if we eliminate the assumption that all firms have the same cost structure before innovation occurs. Doing so brings us one step closer to reality but several steps further from a definitive theoretical result. If firms have different marginal costs, one might wish to know whether weaker firms are more likely to engage in innovation (so as to catch up to or surpass their competitors) or whether the more efficient rivals are more likely to innovate so as to add even more distance between them and their competitors. A few years ago, Boone showed that the answer depends on how much competition there is.[86] If competition is vigorous, the most efficient firm will invest the most in R&D for a new process technology. If competition is weak, though, the least efficient firm will invest the most. Consequently, R&D efforts for new process technologies will tend to preserve the positions of dominant firms in industries with aggressive competition, whereas R&D will cause lagging firms to gain ground on their competitors in industries with weak competition.

Boone's findings are affected by the fact that the level of competition itself is likely to be determined endogenously. Firms are more likely to compete aggressively when their costs and product features are fairly similar. Therefore, R&D that winds up changing those costs and features will also change the incentives for competition, which in turn will change the incentives for maintaining a dominant position or catching up to a stronger competitor. In other words, competition and innovation are interdependent, so they continuously adjust to each other in a continuous feedback loop. That means they may not "stand still" long enough to enable anyone to reach definite conclusions about their relationship.

Other models incorporate the possibility that the cumulative R&D investments that a company makes throughout its existence may affect the probability of success with its current innovation efforts.[87] The more know-how that has been accrued in the past, the more likely that present investments will lead to a profitable innovation. These models reach varying results, with some suggesting that competitive markets are more likely to spur innovation, and others suggesting the opposite. Briefly, when past R&D experience is very important to innovation and there is not much uncertainty involved in the discovery process, a dominant firm that is already ahead in the race to innovate can preserve its lead and assure itself of success. Its competitors, being aware of that, may decide to give up trying to win the innovation wars. Pre-empting rivals is harder when successful innovation is uncertain, and sometimes a firm that is behind in the innovation race will have incentives to work harder and close the gap between itself and the current leader. In those situations, R&D competition can stimulate greater innovation than monopolists would undertake.

One feature of the theories discussed so far is that they seem to be aimed at establishing very black-and-white kinds of relationships between competition and innovation, *i.e.*, they conclude either that pure monopoly is better at encouraging innovation or that pure competition is better at it. Yet at an intuitive level, one might expect that the best market structure for creating incentives to innovate is one with a moderate level of competition. A small firm in a highly competitive market may have such a limited scale of operation that its expected benefit from developing a new technology would not be great enough to motivate an investment in innovation. A large monopolist, on the other hand, may be discouraged from innovating by the large "Arrow" effect created by its current profit stream. Insofar as market concentration informs us about the degree of competition, these considerations suggest that intermediate levels of

86 Jan Boone, "Intensity of Competition and the Incentive to Innovate," 19 International Journal of Industrial Organization 705 (2000).

87 E.g., Drew Fudenberg, Richard Gilbert, Joseph Stiglitz & Jean Tirole, "Preemption, Leapfrogging and Competition in Patent Races," 22 European Economic Review 3 (1983); Chris Harris & John Vickers, "Perfect Equilibrium in a Model of a Race, 52 Review of Economic Studies 193 (1985); Ulrich Doraszelski, "An R&D Race with Knowledge Accumulation," 34 Rand Journal of Economics 20 (2003).

concentration might be best for encouraging innovative activity. The next section examines this idea in more detail.

3.2 Empirical Studies

It is no exaggeration to say that there is an abundance of econometric studies that focus in one way or another on the relationship between competition and innovation. In fact, there is more empirical literature on the relationship between market structure and R&D intensity than there is on any other subject in the field of industrial organisation.[88]

Because both competition and innovation are hard to measure directly, these studies almost always employ proxies, such as concentration ratios or market share for competition and R&D intensity or the number of patents granted for innovation. The proxies are imperfect, as it is now well understood that market structure and the level of competition in the market are not necessarily strongly correlated. Furthermore, R&D intensity and patents are not completely reliable indicators of innovation, as was mentioned above. Nevertheless, economists seem to be getting better at tweaking their models to minimise distortional effects and make the proxies as useful as possible.

If it is possible to tease one central piece of conventional wisdom out of the literature, it would probably be the idea that there is an inverted U-shape relationship between market concentration and R&D intensity when the former is plotted on the horizontal axis and the latter on the vertical axis. In other words, concentration and R&D intensity are generally believed to have a positive relationship at low levels of concentration, with R&D activity reaching a peak at a moderate level of concentration, after which the relationship becomes negative and R&D intensity shrinks as concentration continues to rise. Again, to the extent that market concentration is a good reflection of the degree of competition, the idea here is that the most fertile environment for innovation is a market with a moderate amount of competition.

An early game theory approach by Scherer predicted that greater rivalry, represented by lower concentration indices, stimulates R&D spending up to a certain point, but that too little market concentration would discourage R&D because it would become too difficult for firms to appropriate a sufficiently enticing share of the returns from their innovations.[89] In the 1980s, models based on decision theory agreed with Scherer's theory that intermediate market structures often exhibit the most innovative activity.[90] Newer theoretical models continue to predict that the relationship between product market competition and innovation is best described by the inverted-U shape.[91]

It must be emphasised, though, that the inverted U-shape idea is a generalised description. Findings do vary from industry to industry, among other things, and some studies reach ambiguous or unsupportive results. As Scherer and others have pointed out, the inverted U theory does not always hold up well when more factors that affect innovation (such as how much technological opportunity is available in an industry) are taken into account.[92] For example, Levin, Cohen and Mowery initially found a statistically

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88 Wesley Cohen & Richard Levin, "Empirical Studies of Innovation and Market Structure," in Richard Schmalensee & Robert Willig (eds.), 2 Handbook of Industrial Organization 1060 (1989).

89 F.M. Scherer, "Market Structure and Employment of Scientists and Engineers," 57 American Economic Review 524 (1967).

90 Morton Kamien & Nancy Schwartz, Market Structure and Innovation 105-145 (1982).

91 Phillipe Aghion, Nicholas Bloom, Richard Blundell, Rachel Griffith & Peter Howitt, "Competition and Innovation: An Inverted U Relationship," NBER Working Paper #9269 (2002).

92 F.M. Scherer & David Ross, Industrial Market Structure and Economic Performance 646 (3rd ed. 1990); George Symeonides, "Innovation, Firm Size and Market Structure: Schumpeterian Hypotheses and Some

significant inverted U relationship between market concentration and both R&D intensity and the rate at which innovations were introduced. The relationship peaked at a C4 index[93] of about 50-60 percent, which is consistent with the results Scherer found in his 1967 study.[94] But the authors then took technological opportunity and appropriability into account by adding new variables for factors like secrecy, lead time, and ease of imitation. That greatly reduced the significance of the concentration variables in the regression analysis, but technological opportunity and appropriability were significant. That suggested that whatever relationship may exist between concentration and R&D across an entire economy is overwhelmed by the differences among individual industries with respect to technological opportunities, demand, and the appropriability of inventions. Firm size and market power no longer seemed to matter very much.[95]

Nevertheless, scholars are now producing work that once again supports the inverted U, and this time it does so even when other innovation-influencing factors are taken into account. Mahmood and Lee, for example, conducted an empirical study of Korean *chaebols*[96] to determine how their market shares are related to innovation. Incorporating variables for technological opportunity and the share of basic R&D in each sector studied, the authors found that innovation peaked when the chaebols' sector shares were approximately 65 percent. Interestingly, chaebols happen to account for about 70 percent of sales in the Korean electronics and motor vehicles sectors.[97]

What could be the cause an inverted U relationship between concentration and innovation? One possibility raised by the work of Mahmood and Lee involves entry barriers, which might encourage innovation up to a point and then begin to have the opposite effect. Specifically, it is possible that in markets with low barriers, raising the barriers would lower the risk of R&D investment by stabilising rival behaviour, making it more predictable, and impeding rapid imitation. That, in turn, would stimulate innovation. At some point, though, if they become high enough, entry barriers might start to discourage innovation by facilitating collusion among incumbents and/or giving them so much confidence that their market position is safe that they are not driven to innovate. A strong correlation between the level of entry barriers and market concentration would then explain how entry barriers could cause the inverted U-shape in the relationship between market concentration and R&D intensity.[98]

Another recent study is based on the idea that an excellent test of the effect of competition on innovation would be possible if an unexpected, external event caused a change in the level of competition in a given market, with no change in any other determinants of innovation, such as technological opportunity or appropriability. Carlin, Schaffer and Seabright put that idea to use by examining firm-level performance after the privatisation of State-owned enterprises in 24 transitioning countries. They conclude that a certain minimum level of rivalry is important for stimulating innovation. Firms operating in markets that were exposed to foreign competition innovated more after being privatised. The evidence also shows

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New Themes," London School of Economics, Economics Department Working Paper No. 161 para. 44 (1996).

93 The C4 index is the combined market share of the largest four firms in an industry.

94 Scherer, supra note 89.

95 Richard Levin, Wesley Cohen & David Mowery, "R&D Appropriability, Opportunity and Market Structure: New Evidence on Some Schumpeterian Hypotheses," 57 American Economic Review Proceedings 20 (1985).

96 A chaebol is a cluster of many companies centered around one parent company. The companies usually hold shares in each other. The chaebol concept is similar to the Japanese keiretsu.

97 Ishtiaq Mahmood & Chang-yang Lee, "Business Groups: Entry Barrier-Innovation Debate Revisited," 54 Journal of Economic Behavior and Organizations 513 (2004).

98 Id. at 514.

that the presence of just a few rivals was more favourable to innovative performance than the presence of many, which once again supports the inverted-U relationship between innovation and competition.[99]

An alternative approach to studying the competition/innovation relationship is to look at the degree to which competition is restrained by regulation and then to compare that with R&D intensity across various economies. For research purposes, it is helpful that the OECD countries happen to take a variety of policy stances on competition-restraining regulation, because that makes it easier to draw some tentative conclusions about the effect of such regulation on innovation.

Taken together, Figures 6 and 7 provide some clues about the effect of competition on innovation.[100] In Figure 6, we are concerned for present purposes only with the various countries' positions on the horizontal axis, which represents the extent of competition-restraining regulation. Note in particular the positions of the US, Denmark, Sweden, Japan and Finland along that axis. They are all among the nations with the least competition-restraining regulatory regimes. Now find those same countries in Figure 7. Looking at the bars labelled "G7 industry structure," we see that each of these five countries is in the top six ranked according to R&D intensity.[101] Furthermore, among the countries that appear in both Figures, the two most restrictive regimes at the time the data were taken (Poland and Italy) rank in the bottom four countries for R&D intensity.[102] This is a crude exercise and it was not undertaken by those who created these charts. It does not by any means prove a causal relationship. It does, however, suggest that one is possible. In other words, the Figures do not appear to undercut the idea that less competition-restraining regulation is good for innovation (and therefore for economic growth and consumer welfare, too).

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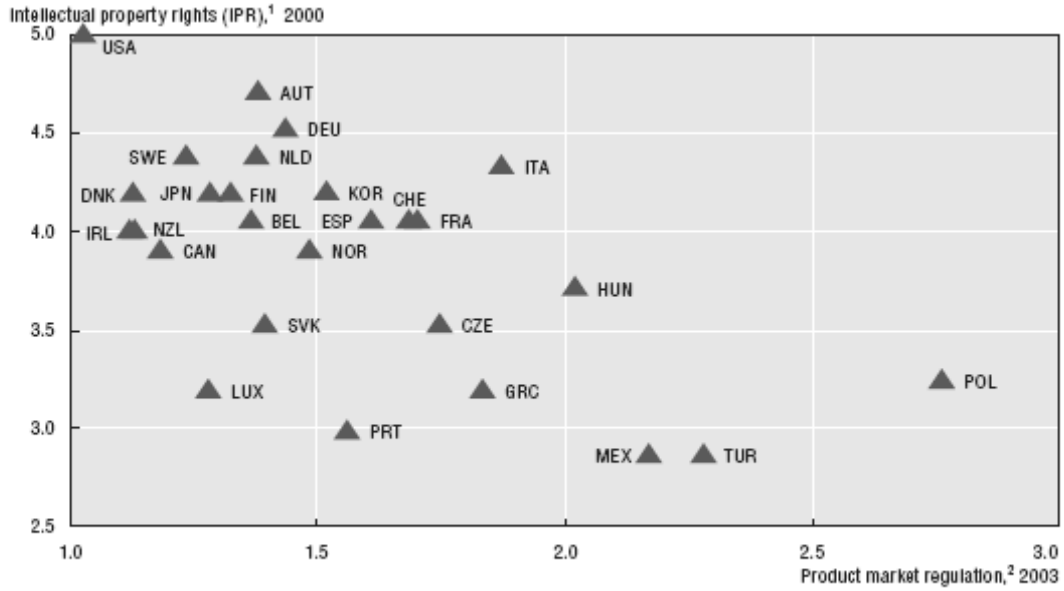
99 Wendy Carlin, Mark Schaffer, & Paul Seabright, "A Minimum of Rivalry: Evidence from Transition Economies on the Importance of Competition for Innovation and Growth," 3 Contributions to Economic Analysis & Policy, Article 17 (2004). As Gilbert points out, this study should be read with certain facts in mind, including that many of the firms studied were very small and that some of them were new, private businesses that were established after privatisation. See Gilbert, supra note 81 at 44-45.

100 The indicator of product market regulation in Figure 6 was developed at the OECD and covers state control over business operation, barriers to entrepreneurship and to external trade and foreign direct investment. For more information, see OECD, supra note 1 at 67 n.15.

101 It is important to look at these bars, rather than the ones entitled "country specific structure," because the latter do not account for the fact that some countries have more R&D intensive industrial structures than others, which would bias the results. The pharmaceuticals and information technology sectors, for example, tend to have the highest R&D intensities across OECD countries. But these sectors make up a greater share of some economies than others, which biases the results. Therefore, the G7 industry structure bar is included for each country. It filters out the country-specific industrial structure effects by re-calculating the overall business sector R&D intensity in each country under the assumption that each country has the same average industry structure as the G7 countries. Id. at 57.

102 If the same statistics are measured again several years from now, it appears likely that Italy will move up in the rankings because it has recently passed legislation that makes several pro-competitive changes to its regulatory regime. See Act August 4, 2006, n. 248, "Urgent Provisions Regarding Economic and Social Development, the Control and Rationalisation of Public Expenditure, Interventions in the Fields of Public Revenue and Repression of Tax Evasion." For further details, see OECD, Recent Liberalization Drive in Italy, DAF/COMP/WP2/WD(2006)66.

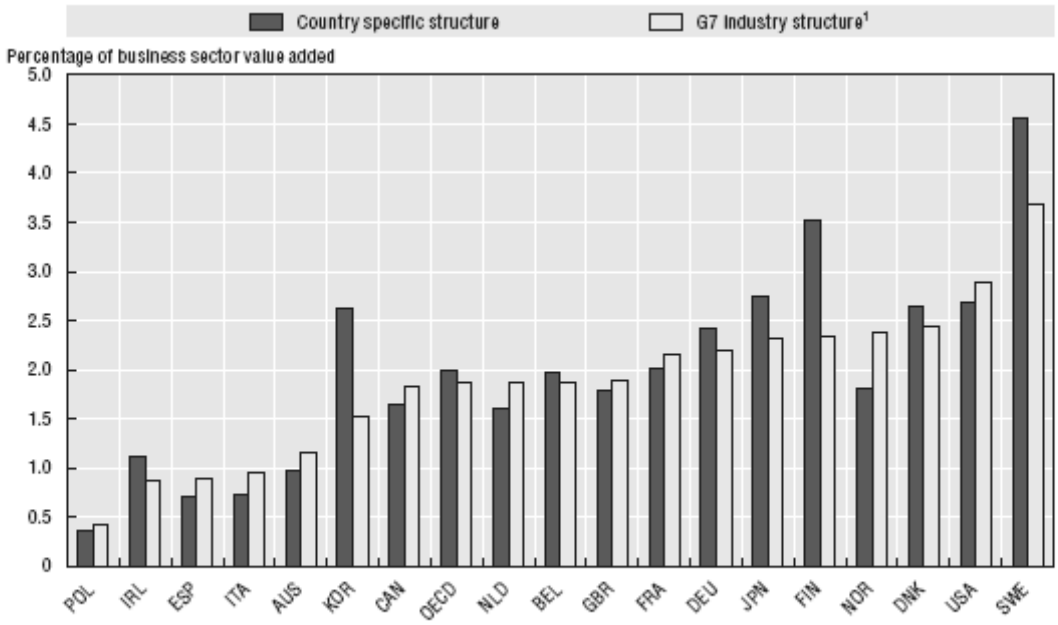
Figure 6. Competition-Restraining Product Market Regulations and Intellectual Property Rights



1. Index scale of 0-5 from least to most restrictive.
2. Index scale of 0-6 from least to most restrictive.

Source: OECD, Going for Growth 68 (2006).

Figure 7. R&D Intensity in the Business Sector Adjusted for Variations in Industry Structure Average, 1999-2002



1. All countries are assumed to have the same industry structure. Calculated on the basis of R&D intensity per industry with the weights of each industry corresponding to their share of total business-sector value added on average across G7 countries.

Source: OECD, Going for Growth 59 (2006).

Fortunately, two OECD economists examined this issue more rigorously in 2005.[103] They used panel regressions to study the effects of innovation policies and other economy-wide factors on business R&D intensity and patenting for a sample of 20 OECD countries over the period 1982-2001. Their results show that, all else being equal, anti-competitive regulations (other than IPRs) have a significant negative correlation with both R&D intensity and patenting. In fact, the authors concluded that the low levels of such regulations in Australia, the UK and the US helped to raise the intensity of R&D in each of those countries by ten percent or more above the OECD average. In contrast, the presence of more anti-competitive regulations in Ireland, Italy and Portugal reduced their R&D intensities by more than eight percent relative to the OECD average.[104] Pro-competitive reform was therefore found to pay large dividends. This relationship shows up in the overall data set, too, as Table 1 illustrates.

Table 1. Long-Run Effects of a One Standard Deviation Increase in Various Factors[1]
Measured in percentage change of the dependent variable

	Business R&D spending	**Total domestic patents**
Science policies and institutions		
B-index[2]	-1¾	-6
Subsidies for private R&D/GDP ratio	¼	-3
Share of business funding in non-business R&D	8¼	2½
Non-business R&D/GDP ratio	7¼	3¾
IPR index	1½	8
USA real wage of researchers	-3¼	-¾
Years of education	1	¾
Economic conditions		
Profit/GDP ratio	5¼	4¼
Private sector credit/GDP ratio	-1½	-3¼
Equity financing/GDP ratio	5¾	10
Foreign R&D stock/GDP ratio	12¾	6
Openness	-5¾	-4¼
Import penetration	-¼	0
Real interest rate	-5	-2¾
Real exchange rate	-3	-1¾
Framework policies (decrease)		
Product market regulation	9	4¼
FDI restrictions	--	13
Employment protection legislation	1	6½

1. The standard deviation is the average of within-country standard deviations, and the effects of a one standard deviation increase in factors are evaluated at the sample mean of the variables.
2. The B-index is defined as one minus the rate of tax subsidy for R&D.
Source: Jaumotte & Pain, supra note 2 at 8.

103 Jaumotte and Pain, supra note 45.

104 Id. at 14, 25.

Specifically, a reduction of one standard deviation in the level of competition-restraining product market regulation was found to increase business R&D spending by nine percent. That makes pro-competitive reform the second most productive factor for raising R&D spending, and places it far ahead of strengthening IPRs, which produced only a 1.5 percent gain in R&D spending. Easing product market regulations was also found to raise both the level of patenting and the proportion of firms who are successful innovators.[105] Furthermore, as the authors note, the table indicates that "[t]the case for further strengthening of intellectual property rights for patent holders in OECD countries appears weak, especially in those that already have comparatively strong patent protection. The evidence suggests that it will lead to more patenting, but have almost no effect on R&D expenditures."[106]

One subject area where the data line up more in support of Schumpeter's vision concerns the kinds of innovation that large incumbents pursue in comparison to what challengers typically attempt to do. The former group tends to focus on developing inventions that build on or extend the status quo technology, whereas smaller firms and entrants are more likely to concentrate on disruptive innovation that will seriously alter the fundamental nature of markets. Because new technologies that change the elements necessary for success may reconfigure the state of competition, they are often welcomed as a strategic opportunity by marginal competitors while being treated as a threat by the leading firms. That is often true even if the leading firms are the ones who created the new technology. In those cases, the incumbent simply shelves the technology, having patented it, kept its existence secret, or taken other measure to prevent competitors from using it. Consequently, breakthrough inventions – the kind Schumpeter had in mind when he wrote about creative destruction – are often brought to market by small start-ups or companies that were operating in other markets.[107] An implication for competition enforcers is that innovation is most likely to thrive in market environments that support a variety of firm sizes and feature low barriers to entry for technologically innovative entrants.[108]

One of Schumpeter's arguments in favour of monopolistic market structures is that monopoly can promote innovation by providing a more stable platform for R&D. The empirical literature, however, does not support the conclusion that relatively large and/or monopolistic firms innovate more due to an ability to provide large, stable cash flows, enjoy economies of scale, or better diversify their risk. Nevertheless, neither theoretical nor empirical evidence warrants a strong conclusion that competitive markets always produce more innovation, either. Consequently, a general theory of innovation and competition remains out of reach, although the considerable body of theoretical and empirical work continues to show progress. Cross-industry studies of market structure and R&D are yielding more robust results by using better data, better measures of competition, and better econometric techniques.

In the meantime, the absence of definitive evidence for the position that greater concentration leads to less innovation has caused some commentators to conclude that competition authorities should not intervene on that basis because they might inadvertently reduce innovation instead of encouraging it.[109] One may also question whether a government agency can be in a position to ascertain which way the trade-

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105 Jaumotte & Pain, supra note 2 at 7.

106 Id. at 9.

107 Susan DeSanti & William Cohen, "Competition to Innovate: Strategies for Proper Antitrust Assessments," in Rochelle Dreyfuss, Diane Zimmerman & Harry First (eds.), Expanding the Boundaries of Intellectual Property (2001).

108 F.M. Scherer & David Ross, Industrial Market Structure and Economic Performance 654 (3rd ed. 1990).

109 Transcript of Testimony, US FTC Hearings on Global and Innovation-Based Competition (25 October 1995) pp. 917-19, 922, 926, 930, 995-96.

off should be resolved between pursuing two (or more) different but competitive research paths and eliminating the less promising or largely duplicative project(s).

DeSanti and Cohen argue that such concerns are unwarranted. Just because there is no grand unifying theory of competition and innovation does not mean that individual cases cannot be understood and correctly analysed, they contend. Documents or testimony, for example, may clearly establish that Arrow's model of a monopolist with an incentive to diminish, retard, or halt innovation is fully applicable to the case under consideration. Furthermore, they argue that adopting a wait-and-see approach to potentially innovation-harming mergers is not a good solution because re-creating lost innovation will be extremely difficult, even if the agency eventually assures itself that some innovation was lost. Accordingly, DeSanti and Cohen recommend that if agencies are going to do anything about potentially innovation-reducing mergers, they should act before the mergers are consummated.[110]

4. Conclusion

Patents are playing an increasingly important role in innovation and economic performance. The relationship between patents and innovation is complex and it varies by industry sector and individual firm characteristics. While there is general agreement that patents are effective for providing incentives to innovate in some sectors, such as pharmaceuticals, strong evidence of such a relationship is hard to find in other sectors, such as software. Nevertheless, it appears that the expansion of patent protection has affected the behaviour of many types of companies, even if it does not always have a strong impact on their innovation activities. For patents to play their dual role of fostering innovation and diffusing technology, governments must take steps to ensure that they are of high quality. That is to say, patents should not feature very broad claims, weak inventiveness and insufficient disclosure, all of which may lead to congestion in the patent system and thereby reduce innovation. Competition agencies can help by engaging patent offices in dialogues, sharing their insights on how patent systems might be improved.

Competition also has a complicated influence on innovation. At this point no one can claim to be certain exactly how it works, but there are sound theoretical reasons for believing that competition can reduce innovation in some circumstances and that it can increase innovation in others. At the level of individual markets or industries, there seems to be lingering support for the hypothesis that moderate levels of competition are best for innovation, though this is still a controversial idea. At the economy-wide level, there is some reason to believe that competition is positively related to innovation, based on studies involving the degree of anti-competitive product market regulation in various countries.

[110] DeSanti & Cohen, supra note 107 at 333-34. For more on innovation market analysis, see id. 337-341.

NOTE DE RÉFÉRENCE

1. Introduction

L'innovation est un sujet qui retient depuis longtemps l'attention des économistes et cela, à juste titre. C'est à l'innovation que l'on doit l'essentiel de l'amélioration des niveaux de vie matériels depuis la révolution industrielle[1]. Les produits, services et procédés de fabrication nouveaux et améliorés sont le principal moteur de la croissance économique. De fait, il est largement admis que l'effet dynamique de l'innovation sur le bien-être des consommateurs l'emporte largement sur les effets statiques que privilégie souvent la politique de la concurrence. Toutefois, alors que certains commentateurs pensent que la concurrence en elle-même favorise l'innovation, d'autres font valoir que les entreprises les plus innovantes sont celles qui ne sont pas ou peu confrontées à la concurrence. C'est là un vieux débat entre économistes qui continue à alimenter des travaux théoriques et empiriques. De même, alors qu'un grand nombre d'experts pensent que les régimes de droits de propriété intellectuelle («DPI») favorisent l'innovation et que les droits de brevets doivent, de façon générale, être renforcés, d'autres mettent en doute cette corrélation et affirment que les brevets peuvent aller jusqu'à faire obstacle à l'innovation, lorsque certaines conditions sont réunies.

Dans ce domaine, bon nombre de questions sont encore sans réponses. Non seulement il reste à déterminer quel modèle – de la pression de la concurrence ou de la récompense des droits exclusifs – est le plus propice à l'innovation, mais qu'il s'agisse de la concurrence ou des brevets, tous deux semblent avoir des effets contradictoires sur l'innovation. Dans une large mesure, les résultats enregistrés dans des secteurs donnés semblent dépendre de circonstances bien précises. L'objet de la présente Note est d'étudier et d'éclaircir ces circonstances, dans l'espoir que cela aidera les organismes chargés de la politique de la concurrence à promouvoir des structures industrielles et des niveaux de concurrence favorisant l'innovation, et que cela constituera un apport aux débats sur les effets d'une politique des DPI sur l'innovation.

Bien que la plupart des gens aient une certaine idée de ce qu'est l'innovation, il peut être utile d'apporter quelques précisions à ce sujet. L'innovation signifie que de nouveaux savoirs ont été développés et exploités avec succès. Par conséquent, cela va au-delà de la simple invention. Cela implique souvent d'effectuer les dépenses d'équipement nécessaires à la fabrication et à l'utilisation de nouveaux produits et de nouveaux procédés, de former des employés et de restructurer l'organisation. Il est commode d'envisager l'innovation comme un processus faisant intervenir un grand nombre d'étapes différentes, allant de la recherche-développement (R-D) à la mise au point de prototypes et au dépôt de demandes de brevets, avant d'aboutir à l'exploitation commerciale. Il va sans dire que bien des idées ne connaîtront pas un succès commercial. De plus, des brevets peuvent être délivrés au titre d'inventions qui ne sont pas issues d'un processus officiel de R-D. En effet, un grand nombre d'innovations utiles ne figurent pas parmi les statistiques ayant trait aux brevets ou à la R-D. Des recherches empiriques donnent toutefois à penser qu'il existe une corrélation positive entre chaque étape du processus d'innovation. Par conséquent, les

[1] OCDE, Réformes économiques : Objectif croissance (2006) p. 56.

politiques ayant une incidence sur la R-D auront également, à plus ou moins long terme, une incidence sur le brevetage et vice versa, ainsi que sur l'introduction sur le marché de produits innovants.[2]

L'objectif premier de la présente Note est d'étudier le rôle des brevets et de la concurrence en tant que stimulant mais aussi en tant que de frein à l'activité innovante. Beaucoup d'autres facteurs influencent les incitations à investir en R-D et le développement de nouveaux produits. Parmi bien d'autres éléments, ces facteurs incluent le degré d'opportunités technologiques qui existent dans un secteur d'activité, les contrôles réglementaires (telles les réglementations en matière de sécurité pharmaceutique), la demande à long terme, les taux d'intérêt réels et les lois fiscales. La présente Note ne porte pas sur ces autres facteurs. En outre, elle ne traite pas directement de questions de respect d'application et ne s'attache notamment pas à déterminer dans quelle mesure certains accords d'octroi de licence de DPI ou d'autres utilisations stratégiques de la propriété intellectuelle enfreignent ou non la législation en matière de concurrence. Enfin, elle n'aborde pas directement le vaste sujet de savoir comment concevoir une politique exhaustive de la concurrence qui maximise l'innovation. Elle porte plutôt sur un objectif plus modeste; celui de fournir des données utiles sur les preuves théoriques et empiriques qui peuvent permettre de déterminer dans quelle mesure divers degrés de protection octroyée par un brevet et divers niveaux de concurrence influencent l'innovation[3].

La deuxième partie passe en revue les conclusions auxquelles on est parvenu sur le plan théorique et empirique au sujet de la corrélation qui existe entre brevets et innovation. Elle porte sur l'influence des droits de brevets sur l'innovation en général ainsi que sur les effets exercés en la matière par des politiques de brevet plus vigoureuses, mises en œuvre depuis les années 80. Elle examine également le bien-fondé de certains arguments en faveur d'une réforme du régime des brevets, mentionne certaines manières dont les responsables de la concurrence pourraient s'y prendre pour améliorer de tels régimes, et étudie quelles sont, en dehors des brevets, les principales options auxquelles peuvent recourir les entreprises désireuses de protéger leurs innovations des imitateurs. La troisième partie est consacrée à l'analyse des conclusions théoriques et empiriques dont on dispose au sujet de la corrélation qui existe entre concurrence et innovation. De même que pour les brevets et pour l'innovation, il semblerait qu'il n'y ait pas de règle universelle permettant de prévoir l'influence de la concurrence sur l'activité innovante dans tous les cas de figure. Il y a plutôt différentes conditions qui entraînent différents résultats. Certaines des implications politiques sont également abordées.

Les principaux points de ce document sont :

- La corrélation qui existe entre brevets et innovation est complexe. Les effets des brevets sur l'innovation varient considérablement d'une branche d'activité à l'autre. De ce fait, il est très difficile de décrire cette corrélation en termes universels. Toutefois, à quelques exceptions près et au vu des données dont on dispose, on peut du moins affirmer que quel que soit le rôle que jouent les brevets dans l'innovation, celui-ci est relativement mineur. Ce n'est que dans quelques secteurs (industries chimiques et pharmaceutiques, notamment) que les brevets jouent un rôle important dans la motivation des entreprises à investir en R-D. Ailleurs, on considère que les brevets ne sont pas des instruments très efficaces pour protéger les innovations. En fait, certaines études font apparaître que, de toutes les méthodes permettant aux entreprises de protéger la rentabilité de leurs innovations, les brevets sont la méthode à laquelle les entreprises ont le moins fréquemment recours, alors que ces mêmes entreprises sont fortement tributaires du secret et de

2 Florence Jaumotte et Nigel Pain, "Innovation in the Business Sector," OCDE, ECO/WKP(2005)46, Document de travail du Département des affaires économiques n°459 (2005) p.13.

3 Pour des notes portant sur les questions d'exécution des DPI, voir OCDE, DAF/COMP(2004)24, Intellectual Property, Note de référence ; OCDE, DAFFE/COMP(2002)20, Merger Review in Emerging High Innovation Markets, Note de référence.

l'avance momentanée que leur procure leur innovation.

- Malgré cela, le nombre de brevets délivrés au cours des quinze dernières années environ, est monté en flèche. Cette augmentation s'explique peut-être tout simplement par l'accroissement significatif des activités innovantes ce qui donne lieu à la délivrance d'un plus grand nombre de brevets. Plusieurs études empiriques permettent toutefois de douter que la cause première d'une telle augmentation tienne à l'essor des innovations. Elles attribuent plutôt l'augmentation du nombre de brevets à des facteurs tels que la baisse des montants facturés aux déposants de demandes de brevets ou telle que la tendance de plus en plus marquée à la constitution d'importants portefeuilles de brevets permettant de négocier avec d'autres détenteurs de brevets.
- Bien que l'on ne puisse démontrer à l'évidence qu'il existe, de façon générale, une corrélation positive entre brevets et innovation, plusieurs pays ont commencé à renforcer leurs régimes de brevets dans les années 80 et continuent de le faire. En conséquence, les droits de brevets ont été étendus à de nouveaux domaines ; ils ont été améliorés et il est devenu plus facile de s'en prévaloir. Depuis quelques années, les commentateurs constatent avec inquiétude que le nombre de brevets délivrés de nos jours est excessif, que le champ des revendications auxquelles ils donnent droit est trop large et que les droits qu'ils confèrent à leurs titulaires sont trop importants. Selon les critiques, il en résulte que l'innovation est en fait découragée car il est trop difficile et trop coûteux d'identifier les brevets qui pourraient être pertinents dans le cadre d'une invention et de payer les licences qui pourraient être nécessaires.
- Un grand nombre d'études empiriques ont été réalisées dans le but d'analyser les effets des changements qui sont intervenus dans les politiques de brevets. Certaines d'entre elles sont parvenues à la conclusion que si le renforcement des droits de brevets contribuait bien à une augmentation significative du nombre de brevets délivrés, un tel renforcement n'avait que peu d'effets sur les dépenses de R-D, ce qui donne à penser qu'une mesure en ce sens ne favorise pas l'innovation de façon notable. D'autres études font apparaître que l'extension des droits de brevets à de nouveaux domaines, comme celui des logiciels, a provoqué une sorte de ruée sur les brevets, les entreprises se précipitant pour obtenir des brevets sur des technologies existantes dans le but de les utiliser comme instruments de marchandage lors de négociations d'octroi de licences. D'autres encore ont observé que les entreprises ne percevaient pas certains changements de politique tels que l'augmentation des montants octroyés au titre de compensation dans les procès en infraction de brevets, comme ayant une incidence notable sur leur activité en matière d'innovation.
- Les autorités en matière de droit de la concurrence peuvent s'y prendre de plusieurs manières pour aider les organismes de propriété intellectuelle à prendre des mesures améliorant le processus d'octroi de droits de propriété intellectuelle. Ainsi, elles peuvent organiser des débats interdisciplinaires avec les Offices de brevets dans le but de permettre une meilleure compréhension mutuelle des domaines qui leur correspondent. Elles peuvent commander des rapports d'experts portant sur le régime de brevets d'un pays aux fins de déterminer si, et dans quelle mesure, un tel régime nuit à l'innovation. Elles peuvent enfin organiser des séminaires et des auditions réunissant des chercheurs du monde universitaire, des représentants du secteur public et du secteur privé ainsi que des personnes provenant d'un secteur d'activité pour discuter des problèmes posés par les politiques en matière de propriété intellectuelle et des améliorations qui pourraient être apportées à ces politiques.
- Les effets de la concurrence sur l'innovation ont fait, depuis de nombreuses années, l'objet d'études et de débats de la part des économistes. Il s'en dégage deux points de vues très différents. D'une part, il y a ceux qui sont d'avis que les grandes entreprises dominantes sont les plus aptes à produire des innovations ; de l'autre, il y a ceux qui pensent que les entreprises plus petites et plus concurrentielles sont mieux placées pour innover. Les autorités responsables du droit de la concurrence ont tendance à se ranger au point de vue de ces derniers.

Malheureusement, ni la théorie économique, ni les études empiriques ne sont en mesure de trancher le débat, car elles aboutissent toutes à des résultats contradictoires.

- Sur le plan théorique, les conclusions relatives aux rapports entre concurrence et innovation dépendent de plusieurs facteurs. Elles varient notamment selon que l'innovation porte sur un procédé ou sur un produit (s'il s'agit d'une innovation en matière de produits), selon que cette innovation vise à créer un nouveau produit ou à améliorer un produit existant et selon le niveau préalable de concurrence sur un marché donné. Suivant les hypothèses dont seront assortis ces facteurs, on obtiendra différents résultats, certains venant étayer l'idée de monopoleurs hautement innovants et d'autres appuyant la thèse d'entreprises hautement innovantes et vigoureusement concurrentielles. D'autres théories postulent toutefois que les marchés les plus propices à l'innovation sont ceux sur lesquels il règne une concurrence modérée, ni trop faible, ni trop rude.
- Les premières études empiriques appuyaient la théorie selon laquelle des niveaux modérés de concentration du marché (un substitut il est vrai imparfait au niveau de concurrence) étaient les plus propices à l'innovation. Ces études n'ont plus été prises en considération par la suite, car elles ne tenaient pas compte de certains autres facteurs explicatifs. Toutefois, des études plus récentes, intégrant des facteurs supplémentaires, semblent avoir redonné corps à l'hypothèse privilégiant un niveau de concurrence modeste.
- Certaines études empiriques, réalisées par l'OCDE, partent d'un point de vue totalement différent et cherchent à établir une corrélation entre le niveau de la réglementation anticoncurrentielle sur le marché des produits et l'innovation à l'échelle de l'ensemble d'une économie nationale. Il est intéressant de constater que ces études font apparaître l'existence d'une corrélation importante et négative, ce qui porte à conclure qu'il y a fort à gagner à réduire de telles réglementations. En fait, parmi les nombreux instruments politiques qui ont été étudiés, il a été conclu qu'une réduction de la réglementation anticoncurrentielle était la seconde chose la plus importante que les autorités puissent faire pour accroître le niveau des dépenses privées en matière de R-D, et que c'était six fois plus efficace que d'améliorer les DPI.

2. Brevets et Innovation

Le nombre de brevets délivrés dans le monde a considérablement augmenté au cours des 20 dernières années[4]. Au fur et à mesure que les inventions brevetées devenaient de plus en plus courantes dans l'ensemble de l'économie, leur influence sur l'innovation et sur les résultats économiques a gagné en importance. Toutefois, comme nous le verrons ci-après, la délivrance d'un plus grand nombre de brevets ne signifie pas nécessairement qu'il y ait davantage d'innovations. En fait, une question clé est de déterminer si l'influence des brevets n'est pas globalement négative dans certaines branches d'activité.

Les brevets favorisent l'innovation de plusieurs manières. Tout d'abord, ils incitent davantage les inventeurs à inventer, en leur assurant une certaine protection contre les imitateurs qui pourraient, sans cela, laisser l'inventeur faire tout le travail difficile et coûteux de la mise au point d'une technique qu'ils se contenteraient ensuite de copier, rendant bien difficile pour l'inventeur l'obtention d'une rémunération incitative. Deuxièmement, et en échange d'une telle protection, les brevets comportent l'obligation pour l'inventeur de divulguer l'existence de la technologie et d'en expliquer le fonctionnement. Cette divulgation favorise la diffusion de l'information puisqu'elle aide les autres à comprendre l'invention et à l'améliorer ou encore à l'incorporer à une nouvelle invention qui leur serait propre. En d'autres termes, il y a un effet d'entraînement au niveau de la technologie qui stimule l'éclosion de nouvelles idées. La divulgation a également un autre avantage, c'est qu'elle a tendance à réduire les doublons en matière

[4] Voir par exemple, Carl Shapiro, "Patent System Reform: Economic Analysis and Critique," 19 Berkeley Technology Law Journal 1027 (2004).

d'investissements en R-D. Sans cela, en effet, des entreprises qui pourraient continuer à essayer de développer exactement la même technologie. Enfin, les brevets contribuent à la diffusion du savoir puisqu'ils facilitent les échanges par le biais des accords de licence.

D'un autre côté, les droits exclusifs que confèrent les brevets peuvent aboutir à une distorsion de la concurrence et faire obstacle à l'efficacité avec laquelle les ressources sont allouées. Ils peuvent également faire obstacle à des innovations ultérieures. Par conséquent, étant donné l'essor que continue de connaître les brevets, il est de plus en plus nécessaire de faire en sorte que les régimes qui les régissent assurent un équilibre entre le fait d'aider les détenteurs de brevets à bénéficier d'une rémunération appropriée pour leurs innovations et celui d'encourager les progrès technologiques au profit de la société toute entière.

Il n'y a pas très longtemps, une entreprise travaillant sur la mise au point d'un nouveau produit devait prêter attention à une poignée de brevets pertinents pour s'assurer que ses travaux ne portaient pas sur le même champ d'application ou alors, elle devait obtenir une licence. Il était relativement facile de savoir ce auquel il fallait faire attention, de contourner le problème si besoin était ou de négocier l'obtention d'une licence si cela se révélait nécessaire. De nos jours toutefois, une entreprise travaillant à la conception d'un produit de haute technologie peut être confrontée à des milliers de brevets potentiellement problématiques dont elle doit éviter la violation. On délivre plus de brevets par an que cela n'a jamais été le cas auparavant et le taux continue de monter[5]. Les changements importants qui sont intervenus au cours des dernières années dans les politiques de brevets font que d'une manière générale, il est désormais plus facile d'obtenir des brevets et que, dans certaines juridictions, le champ du brevetable a été étendu pour inclure les inventions génétiques, le logiciel et les méthodes d'affaires. En outre, d'autres changements ont facilité le respect de l'application des droits de brevets et ont rendu plus strictes les conséquences juridiques des infractions à ces droits. Il n'est pas encore possible de déterminer de façon précise quels sont les effets de ces changements sur l'innovation, mais pris dans leur ensemble, il est à craindre que ces changements n'aient une incidence négative. Ainsi, certains voient avec inquiétude se développer un « maquis de brevets » ce qui signifie que l'on se préoccupe du fait que l'augmentation du nombre de brevets délivrés ne décourage l'innovation puisqu'il est devenu trop difficile, trop long et trop cher pour les innovateurs de tenir compte des brevets détenus par tous les autres.

La présente section de la Note de référence analyse des éléments théoriques et empiriques pour juger de la corrélation qui existe d'une façon générale entre brevets et innovation, et elle étudie également l'impact des changements survenus dans la politique des brevets dans le but de déterminer dans quelle mesure les brevets encouragent ou non l'innovation. Il se trouve qu'il est difficile de faire des déclarations générales et définitives concernant l'impact des brevets sur l'innovation car les effets produits varient considérablement selon les secteurs d'activité et les domaines technologiques. Toutefois, à quelques exceptions près, on peut dire que les brevets semblent jouer un rôle relativement mineur dans l'innovation.

2.1 Brevets et innovation – données d'information et théorie

Les spécialistes se sont déjà longuement penchés sur la question de la corrélation entre brevets et innovation. Depuis quelques années, plusieurs commentateurs se sont alarmés du trop grand nombre de brevets délivrés, de leur portée trop générale, de la facilité de leur obtention, et du fait que les droits qu'ils

5 Jaumotte & Pain, supra note 2 p. 20, 22 (montrant que les brevets par habitant ont augmenté dans les pays de l'OCDE au cours des 20 dernières années); Adam Jaffe & Josh Lerner, "Innovation and Its Discontents," in Adam Jaffe, Josh Lerner & Scott Stern (dir. pub.), vol. 6 Innovation Policy and the Economy, NBER (à venir) (faisant apparaître que le taux de croissance du nombre de brevets délivrés aux États-unis au cours de la période 1983 à 2004 était de 5,4% par an, alors que ce taux était de 1 % par an de 1930 à 1982.)

confèrent étaient devenus considérables[6]. Certains observateurs se disent persuadés que ces évolutions ont changé la nature des brevets. Alors que ceux-ci favorisaient l'innovation, ils la retardent désormais. La présente section de cette Note analyse leurs préoccupations, aussi bien d'un point de vue théorique qu'empirique.

Les brevets récompensent les inventeurs de leurs découvertes. Pour ce faire, ils consentent aux détenteurs de brevets le droit exclusif de réaliser, d'utiliser et de vendre des inventions pendant une période donnée (généralement de 20 ans) dans le cadre de la ou des juridiction(s) où la demande de brevet a été déposée. Si le brevet a fait l'objet d'une violation, le détenteur du brevet peut poursuivre l'auteur de l'infraction en justice afin de recouvrer les sommes dont il n'a pu bénéficier. En contrepartie des droits de brevet, les déposants d'une demande de brevet doivent divulguer leur invention dans le texte de leurs applications. Ces exposés doivent inclure un descriptif technique de l'invention et des instructions suffisamment claires pour qu'une personne de métier puisse fabriquer ou exécuter l'invention. En d'autres termes, le descriptif doit être « habilitant. » L'invention elle-même est définie dans les « revendications » qui font partie du descriptif. En général, les brevets ne doivent être délivrés que pour des inventions nouvelles, situées au delà de ce qui est évident, et présentant un caractère utile (susceptible d'application industrielle)[7].

Idéalement, un droit de brevet (et le pouvoir de marché qu'il peut conférer) ne devrait être octroyé que si, et seulement dans la mesure où, il est nécessaire pour encourager l'innovation sur laquelle porte ce droit. Ce cadre ne permet pas de disposer de normes opérationnelles pratiques, mais il correspond à la question qui devrait être posée en pratique. Les critères généraux de non évidence, de nouveauté et d'utilité peuvent être considérés comme des substituts à cette question.

La « portée » ou « l'étendue de la protection » d'un brevet aide à déterminer la valeur d'un brevet en fixant les limites du domaine protégé par rapport à ce qui ne bénéficie pas d'une telle protection. Plus la portée est étendue, plus il y a de chances pour que tout produit ou procédé concurrent soit en infraction avec le brevet. La « brevetabilité » fait référence à la facilité ou à la difficulté avec laquelle il est possible de satisfaire aux normes requises pour l'obtention d'un brevet correspondant à une invention. L'étendue du brevet et la brevetabilité peuvent avoir des effets aussi bien positifs que négatifs sur l'innovation. C'est là une source potentielle de frustration pour les décideurs politiques qui pourraient s'apercevoir que l'ajustement des leviers politiques dont ils disposent au titre de la brevetabilité et de la « largeur » du brevet, aboutit à des résultats imprévisibles.

Si l'on commence par considérer les effets positifs, on peut dire que plus un brevet est facile à obtenir, plus l'étendue de sa protection est grande et plus sa durée de validité est longue, plus la récompense à

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6 Voir, National Academy of Sciences, A Patent System for the 21st Century 41-49 (Stephen Merrill, ed.) (2004); Robert Merges, "As Many as Six Impossible Patents before Breakfast: Property Rights for Business Concepts and Patent System Reform," 14 Berkeley High Technology Law Journal 577 (1999).

7 Selon les juridictions, il existe certaines différences concernant les normes juridiques de brevetabilité. Ainsi en Europe, les inventions doivent avoir un « caractère technique ». De même, la Loi japonaise sur les brevets définit une invention brevetable comme la création hautement avancée d'idées techniques en utilisant des lois naturelles ["the highly advanced creation of technical ideas utilising natural laws."] Loi japonaise sur les brevets (1959), Article 2(1). Aux Etats-Unis par contre, quiconque invente ou découvre «tout procédé, appareil, fabrication ou composition nouvelle et utile ou tout perfectionnement nouveau et utile de par la suite» peut obtenir un brevet s'y rapportant. United States Patent Act, 35 USC. Section 101. Par conséquent, les inventions brevetables ont été décrites commes étant "anything under the sun made by man" [tout ce qui existe sur terre de fabrication humaine] pour autant que cela remplisse les critères de brevetabilité. United States Congress Committee Reports [Rapports du Comité du Congrès des Etats-Unis], S. Rep. [Rapport du Sénat] No. 82-1979 at 5 (1952); H.R. Rep. [Rapport de la Chambre des Représentants] No. 82-1923 at 6 (1952).

laquelle pourra s'attendre un investisseur potentiel sera grande au titre de l'innovation qu'il envisage. Or, plus la récompense attendue est élevée, plus il y a de chances pour que l'investisseur se lance à entreprendre l'innovation. De plus, dans la mesure où un brevet est facile à obtenir et où sa portée est étendue, cela incite les concurrents à réaliser des investissements en R-D plus importants et plus divers pour que leurs inventions ne soient pas en infraction avec les brevets existants, et de ce fait les droits de brevets peuvent aboutir à favoriser l'innovation. A l'inverse, les concurrents peuvent opter pour abandonner le marché au détenteur du brevet et investir à la place dans un marché totalement nouveau, ce qui peut donner lieu à une innovation qui ne se serait peut-être jamais matérialisée si le brevet portant sur le premier marché n'avait pas été octroyé.

Les effets négatifs tiennent au fait que plus il est facile d'obtenir des brevets et plus le champ de leurs revendications est large, plus le nombre de brevets délivrés aura tendance à augmenter et plus ceux-ci seront exhaustifs (au point d'atteindre la saturation.) Ce phénomène peut entraîner à son tour cinq types de coûts. Premièrement, les inefficacités statiques augmentent parce que plus il y a de brevets et plus la protection qu'ils confèrent est large, plus il y a de chances de voir apparaître des situations de monopole et les pertes de bien-être social dont elles s'accompagnent. Deuxièmement, les inefficacités dynamiques augmentent car il est de plus en plus difficile pour les autres d'inventer sans porter atteinte au brevet de quelqu'un. Troisièmement, la multiplication de brevets aux revendications étendues encourage un comportement de recherche de rente, entraînant un gaspillage au plan social, comme celui de la « chasse aux brevets abusifs. » Quatrièmement, les frais encourus pour faire respecter l'application de ces brevets seront plus élevés, puisqu'il y en aura davantage à faire respecter. Enfin, il est possible que l'excès de droits de brevets et le fait qu'il soit plus facile de faire breveter une invention conduisent à un surinvestissement inefficace en R-D[8].

Certaines personnes sont persuadées que lorsque des brevets sont délivrés trop facilement ou que l'étendue de la protection qu'ils confèrent est trop importante, un cycle vicieux s'institue qui décourage l'innovation. Cela se produit lorsque l'ensemble des brevets qui ont été délivrés recouvre un domaine si important sur le plan substantiel que les entreprises sont amenées à penser qu'il y a de fortes chances pour que leurs innovations conduisent à des accusations d'infractions de la part d'autres entreprises. Pour réduire leurs risques, les entreprises amassent des portefeuilles de brevets de plus en plus importants, comme s'il s'agissait d'une course aux armements de PI en vertu de laquelle les brevets sont collectionnés essentiellement comme élément de marchandage en cas problème d'infraction. Toutefois, bien évidemment, le fait d'élargir ainsi ces portefeuilles ne fait qu'aggraver le problème. Étant donné le grand nombre de brevets déjà délivrés et leur augmentation constante, il devient de plus en plus difficile de déterminer qui est susceptible d'introduire une action en justice, d'avoir confiance en ses chances de débouter une action en infraction, et de négocier et de payer les licences dont l'obtention est jugée nécessaire. Il en résulte, en théorie du moins, une augmentation du coût global de la R-D, ce qui a pour effet de décourager l'innovation. Cette situation est désignée par l'expression « maquis de brevets » ou anticommuns (*anti-commons)*[9]. Elle est considérée comme particulièrement décourageante pour les entreprises naissantes qui ne disposent généralement pas d'un portefeuille de brevets conséquent pouvant servir d'outil de négociation susceptible d'aider l'entreprise à naviguer dans ce maquis de brevets.

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8 Mark Lemley, "Property, Intellectual Property, and Free Riding," 82 Texas Law Review 1058-59 (2005) (Les écrits de Lemley portaient sur la tendance à étendre toujours davantage le champ des revendications d'un brevet, mais son raisonnement s'applique également aux normes toujours plus généreuses de brevetabilité).

9 Pour plus d'explications sur la théorie des anticommuns, voir Michael Heller & Rebecca Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research," 280 Science 698 (1998); OECD, DAF/COMP(2004)24, Intellectual Property, Background Note 24-25.

Aux États-Unis et dans plusieurs autres pays, le sujet de préoccupation principal, c'est qu'un trop grand nombre de brevets ne remplissent pas les critères exigés de nouveauté et d'utilité ou que l'invention sur laquelle ils portent ait pu paraître évidente à une personne expérimentée dans les techniques pertinentes[10]. Si cela est bien le cas, la société distribue des droits de brevets mais bénéficie moins que jamais des progrès technologiques auxquels elle est en droit de s'attendre. Pour être plus précis, lorsque des autorités délivrent des brevets qui correspondent à des « inventions » évidentes, elles confèrent au détenteur un pouvoir de marché sans bénéficier pour autant en retour d'un avantage appréciable lié à l'innovation. Par conséquent, le détenteur du brevet bénéficie d'une récompense injuste aux dépends du bien-être du consommateur. Pire encore, une avalanche de brevets obtenus aisément peut faciliter le blocage stratégique des brevets, lorsqu'une entreprise obtient un brevet non pas pour protéger une technologie qu'elle prévoit d'utiliser, mais pour faire obstacle au progrès technologique d'un rival.

La propension à accorder plus facilement des brevets et l'extension de la protection conférée par ces brevets rendent également toute nouvelle innovation plus difficile, plus coûteuse et plus risquée dans la mesure où les questions d'infraction deviennent une préoccupation plus pressante. Cela a pour conséquence de réduire les innovations induites et cela pour deux raisons. Tout d'abord, le détenteur de brevet sera vraisemblablement plus satisfait de sa position de force en matière de brevets et il sera de ce fait moins disposé à investir dans de nouvelles innovations. Deuxièmement, les innovateurs qui viendront par la suite auront vraisemblablement davantage besoin d'obtenir une licence d'exploitation du brevet initial avant de pouvoir tirer un quelconque profit de leur travail. La tâche d'identifier et de payer les licences nécessaires absorbe de précieuses ressources. Ces ressources sont gaspillées lorsque des brevets abusifs ou octroyant une trop grande protection sont délivrés. En fait, une politique laxiste en matière de brevets peut conduire à une situation où les intrants nécessaires sont tellement nombreux à être brevetés que l'argent et le temps requis pour les identifier et acheter les licences correspondantes découragent ou suspendent toute nouvelle innovation dans un domaine de recherche donné.

Réfléchissez aux commentaires de ce cadre de Texas Instruments : « TI possède quelques 8000 brevets en cours de validité aux États-Unis et nous pensons que pour savoir avec un minimum de précision ce qu'il y a dans ce portefeuille il faudrait se livrer à un exercice qui confonde l'imagination et grève le budget » [11] Si une entreprise qui dispose des ressources de Texas Instruments ne peut même pas s'offrir le luxe de savoir ce qui se trouve dans son *propre* portefeuille, on peut imaginer à quel point il est difficile pour un nouveau venu potentiel de déterminer quels sont ses risques de déclencher une action en infraction de brevet.

L'une des difficultés auxquelles se heurtent les décideurs politiques, c'est qu'il est pratiquement impossible de quantifier la valeur nette de l'innovation qui sera gagnée ou perdue selon qu'ils optent pour une politique de brevets plus stricte ou plus généreuse. Malgré tout, une grande partie du travail théorique a été réalisée dans le but d'aider les décideurs politiques qui cherchent à obtenir une configuration optimale des brevets[12]. On trouvera ci-après une introduction à ce travail, mais dans la mesure où les méthodes

10 Voir, Shapiro, supra note 4 qui affirme que le chœur des plaintes relatives au régime des brevets en vigueur aux États-Unis se fait entendre de plus en plus depuis quelques années et que certaines des plaintes les plus virulentes émanent des entreprises qui détiennent elles-mêmes un grand nombre de brevets.

11 Déposition de Frederick Telecky, US FTC/DOJ Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy (28 février 2002), disponible à www.ftc.gov/opp/intellect/020228ftc.pdf (cité par Brian Kahin dans "Through the Lens of Intangibles: What Patents on Software and Services Reveal about the System," dans OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 211).

12 Une grande partie des commentaires est tirée de Nancy Gallini & Suzanne Scotchmer, "Intellectual Property: When Is It the Best Incentive System?," in Innovation Policy and the Economy, vol. 2, Adam Jaffe, Joshua Lerner & Scott Stern (dir. pub.) 63-69 (2002).

applicables à la configuration optimale des brevets ne sont pas ici notre propos principal, cette introduction sera brève.

Bon nombre de cadres théoriques définissent un régime de brevet optimal comme étant un compromis entre la durée de validité d'un brevet et l'étendue de la protection qu'il confère. Ainsi, Gilbert et Shapiro définissent la longueur d'un brevet comme étant le prix qu'une innovation donnée atteindra sur le marché. Utilisant leur modèle pour calculer quel est le surplus social maximum correspondant à toutes les combinaisons de l'étendue d'un brevet et de sa durée qui donnent lieu à des recettes suffisantes pour couvrir les coûts de R-D, les auteurs concluent que la longueur optimale d'un brevet est infinie et que la portée optimale est celle qui suffit à couvrir les investissements en R-D[13].

Gallini est parvenue au résultat opposé quand elle a redéfini l'étendue d'un brevet comme étant un élément déterminant de la facilité d'accès au marché de l'innovation. Dans son modèle, l'étendue du brevet constitue le coût que les nouveaux venus doivent supporter pour imiter l'invention sans l'enfreindre pour autant. Une moins grande portée entraînera un prix inférieur parce qu'il sera plus facile pour les concurrents d'inventer sans empiéter sur le brevet. Il n'est toutefois pas évident d'en déduire ce que cela implique pour les brevets de plus longue durée. Jusqu'à un certain point, une prolongation de la durée du brevet augmentera les bénéfices de l'inventeur. En fin de compte, toutefois, la durée devient suffisamment longue pour que cela commence à encourager les concurrents à investir en R-D dans le but d'inventer hors du champ d'application du brevet. Une partie au moins de cette R-D fera double emploi et sera donc source de gaspillage. L'objectif de Gallini est de trouver une combinaison d'étendue et de durée qui minimise les deux types de coûts sociaux qu'entraînent les brevets : les pertes de bien être social et les doublons en matière de R-D. Elle démontre que la configuration optimale, qui permet d'éliminer complètement les doublons en matière de R-D, est celle qui prévoit des brevets au champ de revendications étendu mais dont la durée de validité est brève[14]. Si les brevets sont suffisamment étendus pour décourager toute tentative d'invention en dehors de leur champ de revendications, mais tellement éphémères qu'ils ne donnent à l'inventeur une position de monopole que pendant le temps de recouvrer ses coûts, les concurrents se contenteront d'attendre que le brevet expire et copieront ensuite l'invention, ce qui minimisera les pertes de bien être social.

Maurer et Scotchmer ont fait valoir par la suite que Gallini n'a pas tenu compte de la possibilité d'avoir recours à des licences d'exploitation. Pour être plus précis, le problème consistant à effectuer plusieurs fois les mêmes dépenses de R-D pourrait aisément être évité de façon volontaire en recourant à des licences privées plutôt qu'en ajustant la politique publique des brevets[15]. Cela redonne toute sa valeur à la recommandation de Gilbert et Shapiro selon laquelle l'idéal théorique serait des brevets restreints, d'une durée perpétuelle.

Les modèles ci-dessus reposent sur l'hypothèse selon laquelle l'innovation serait un processus discret aboutissant à une invention distincte à la fois. Il arrive pourtant fréquemment que l'innovation soit un processus cumulatif en ce sens qu'elle repose sur des inventions antérieures. Ainsi, la R-D peut avoir pour objet d'améliorer une technologie existante ou de lui trouver une nouvelle application, et non d'aboutir à une invention entièrement nouvelle et indépendante. Tenir compte d'une telle considération ajoute certaines complications au problème de la configuration optimale des brevets.

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13 Richard Gilbert & Carl Shapiro, "Optimal Patent Length and Breadth," 21 RAND Journal of Economics 106 (1990).

14 Nancy Gallini, "Patent Length and Breadth with Costly Imitation," 44 RAND Journal of Economics 52 (1992).

15 Stephen Maurer & Suzanne Scotchmer, "The Independent Invention Defense in Intellectual Property," 69 Economica 535 (2002), disponible à http://ssrn.com/abstract=34710.

Scotchmer a identifié comme principal défi le fait que sans des innovations fondamentales ouvrant de nouveaux horizons, il ne peut y avoir d'innovations induites. Une partie des bénéfices générés par des inventions induites est donc imputable au travail de base effectué par l'innovateur pionnier. Si l'on veut que l'inventeur initial soit incité à inventer par la perspective d'obtenir un montant approprié, alors, il faut que cet inventeur puisse obtenir certains des bénéfices ultérieurs. Faute de quoi, les innovateurs initiaux ne seraient pas suffisamment récompensés pour le surplus social qu'ils ont contribué à créer. La difficulté consiste à déterminer comment répartir les bénéfices de façon optimale entre l'invention fondamentale et les inventions dérivées, afin que toutes ces inventions soient encouragées comme il convient.

Ce qui ajoute encore à la complexité de cette question, c'est que l'innovation, prise en compte de manière cumulative, introduit nécessairement un autre levier politique (qui vient s'ajouter à l'étendue du brevet et à sa durée) qui doit être optimisé : celui de l'inventivité minimale requise. Il s'agit de déterminer quel est le degré d'innovation que l'on doit attendre d'une invention induite pour que celle-ci puisse prétendre à la protection d'un brevet. Quel que soit le niveau auquel on place la barre, il y aura des avantages et des inconvénients. Si le niveau d'inventivité requis est faible, cela présente l'avantage d'encourager la divulgation même des plus petits progrès technologiques. D'un autre côté, le fait de savoir que des concurrents peuvent obtenir des brevets sur des améliorations (même mineures) apportées à une innovation, peut inciter les inventeurs à préférer le secret aux brevets. Si le niveau d'inventivité requis est important, les entreprises ont intérêt à fixer des objectifs ambitieux à leurs programmes de R-D, mais les avancées plus modestes ne seront pas rendues publiques. Quoi qu'il en soit, un point sur lequel les spécialistes de cette question semblent tomber d'accord, c'est que la configuration optimale d'une politique de brevets dépend de la facilité ou de la difficulté avec laquelle les détenteurs de brevets peuvent concéder des licences pour réorganiser leurs droits et pour les exercer[16].

La prochaine sous-section se propose de voir quel éclairage les études empiriques peuvent apporter sur ces questions.

2.2 Brevets et innovations – études empiriques

On ne manque pas d'études quantitatives analysant la relation entre brevets et innovation. En fait, il y en a bien trop pour que l'on puisse en faire ici l'étude exhaustive. On trouvera ci-après une synthèse de quelque unes des conclusions les plus importantes et les plus significatives des recherches menées récemment par l'OCDE et des publications universitaires.

2.2.1 Analyses générales sur la relation entre brevets et innovation.

L'une des hypothèses à laquelle pourrait donner lieu cet accroissement de l'activité internationale en matière de brevets depuis une quinzaine d'années environ, c'est que cet accroissement est imputable essentiellement à une augmentation des innovations. Certaines études viennent toutefois miner cette théorie. Ainsi, l'analyse économétrique des brevets qu'a effectuée le Professeur Kortum et qui porte sur les brevets délivrés par l'Office européen des brevets (OEB), donne à penser que plus de la moitié de la l'augmentation des dépôts de demande de brevets durant les années 90 est imputable à une baisse des taxes concomitantes. Selon son modèle, près de deux tiers des 6 % environ de croissance annuelle enregistrée entre 1991 et 2000 sont dus à une baisse des montants perçus lors des dépôts de demandes de brevets[17]. D'autres études, qui portent à douter que l'augmentation de l'innovation puisse être à l'origine de la hausse des demandes de brevets, sont examinées à la section 2.2.2.2.

16 Gallini & Scotchmer, supra note 12 p. 69.

17 Jonathan Eaton, Samuel Kortum & Josh Lerner, "International Patenting and the European Patent Office: A Quantitative Assessment," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 48.

Harhoff, Scherer et Vopel (« HSV ») ont essayé de mieux comprendre comment les brevets motivaient les inventeurs en examinant les estimations faites par des centaines de détenteurs de brevets, portant sur la valeur des brevets allemands qu'ils avaient cherchés à obtenir en 1977. Les auteurs se sont rendus compte que les brevets ayant la plus grande valeur représentaient une fraction importante de la valeur totale de toutes les observations. En d'autres termes, ils se sont aperçus que la distribution des valeurs était biaisée, la plupart des inventions étant de faible valeur mais ils ont toutefois constaté qu'il existait une longue *queue* de distribution, de faible fréquence, qui se prolongeait jusqu'à des niveaux de valeurs très élevées[18]. En fait, même en ne prenant en considération que les brevets ayant été renouvelés jusqu'à leur durée de validité maximale, ils ont constaté que la tranche de 5 % regroupant les brevets de plus grande valeur représentait entre 46 et 61 % de la valeur totale des brevets de l'échantillon (selon que l'on tienne compte ou non de la plus grande valeur atypique.) Les auteurs en concluent qu'une distribution aussi biaisée montre qu'il est intrinsèquement dangereux d'investir dans l'innovation technologique, même si cela peut être rentable globalement, étant donné qu'il y a peu de chances pour qu'une invention donnée se situe dans la tranche des inventions de grande valeur[19].

Cette observation a incité Scherer à écrire par la suite un article intitulé "The Innovation Lottery." *(La loterie de l'innovation)*[20]. Réfléchissant aux conclusions de l'étude HSV, Scherer a été intrigué par le fait que ces conclusions viennent appuyer une idée exprimée autrefois par Schumpeter, selon laquelle les innovateurs sont incités à innover essentiellement pour les mêmes raisons que celles qui amènent certaines personnes à acheter des billets de loterie : ils surestiment la probabilité de recevoir un énorme gain monétaire. Ce schéma d'optimisme s'applique également à des entreprises humaines moins technologiques et plus artistiques. Scherer observe que le même phénomène de gains spectaculaires venant récompenser un groupe relativement restreint de créateurs s'applique aux secteurs du cinéma et de la musique.

Ce qu'il serait intéressant de savoir, c'est si une distribution de valeurs ainsi biaisée est plus apte à motiver les inventeurs et les créateurs qu'une distribution qui se contenterait d'accorder des récompenses proportionnelles aux investissements réalisés. Scherer concède qu'il est difficile de prouver ou d'invalider la réponse à cette question de façon rigoureuse. Il se dit prêt toutefois à aller jusqu'à avancer l'hypothèse d'une réponse positive, en se fondant sur les théories portant sur les raisons pour lesquelles certaines personnes sont incitées à parier alors que la probabilité de gagner des sommes extrêmement importantes est

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18 Dietmar Harhoff, Frederic Scherer & Katrin Vopel, "Exploring the Tail of Patented Invention Value Distributions," in Ove Granstrand (Ed.), Economics, Law and Intellectual Property: Seeking Strategies for Research and Teaching in a Developing Field (2003).

19 Les résultats de l'étude HSV sont compatibles avec ceux de plusieurs autres études qui parviennent toutes à des distributions biaisées. Voir, Jean Lanjouw, Ariel Pakes & Jonathan Putnam, "How to Count Patents and Value Intellectual Property: Uses of Patent Renewal and Application Data," 46 Journal of Industrial Economics 405 (1998) (qui conclut que dans quatre groupes de technologie, la tranche de 5 % des brevets allemands présentant le plus de valeur représente 22 à 31% de la valeur totale des brevets de ces groupes); F.M. Scherer, "The Size Distribution of Profits from Innovation," 49/50 Annales d'Économie et de Statistique 495 (1998.) Cependant, l'importance des valeurs qui figurent dans la queue de distribution des résultats de HSV est beaucoup plus élevée que dans d'autres études. Cela tient probablement au fait que HSV ont examiné la question de contre-épreuve consistant à savoir combien cela aurait coûté d'être privé de l'utilisation d'une invention, au lieu de chercher à savoir combien cela coûterait de laisser un invention tomber dans le domaine public. Harhoff, et al., supra note 18 p. 302.

20 F.M. Scherer, "The Innovation Lottery," in Rochelle Dreyfuss, Diane Zimmerman & Harry First (eds.), Expanding the Boundaries of Intellectual Property (2001).

très faible. Si son hypothèse est exacte et que ces théories s'appliquent bien aux innovateurs au même titre qu'aux parieurs, qu'est-ce que cela implique pour les décideurs politiques[21] ?

D'après Scherer, cela implique que des droits de brevets élevés peuvent faciliter et protéger les avantages considérables qui peuvent se produire de temps à autre, ce qui encourage l'innovation par ceux qui aiment prendre des risques et toucher d'importantes récompenses. Cela signifie également que les droits de brevets ne devraient pas être révoqués pour la seule raison qu'un titulaire a gagné, au titre d'une invention, des sommes que d'aucuns jugent trop importantes. Il faut qu'il existe la possibilité de gagner gros pour qu'un système d'incitation impliquant de gros risques puisse marcher. Toutefois, cela ne veut pas dire pour autant que les droits de brevets ne doivent jamais être affaiblis en aucune circonstance. Scherer constate, entre autre raison, que tous les innovateurs ne sont pas motivés par des brevets ou par des systèmes d'incitation assimilables à ceux de la loterie qu'ils ont contribué à créer[22].

En effet, ce n'est que pour certains secteurs que l'on dispose de preuves empiriques fiables montrant que l'existence de brevets constitue un facteur important dans la décision des entreprises d'investir en R-D. Ainsi, plusieurs enquêtes font apparaître le rôle important que jouent les brevets dans les industries chimiques et pharmaceutiques américaines[23]. Ces mêmes enquêtes montrent toutefois par ailleurs, que dans beaucoup d'autres secteurs, on ne considère pas que les brevets soient très efficaces pour protéger les innovations. D'autres études portant sur les effets des brevets sur l'innovation ont abouti à des résultats ambigus. Les brevets favorisent l'innovation dans certaines situations mais pas dans toutes, et dans certains cas, ils semblent même être préjudiciables.

Un document de Cohen, Nelson, et Walsh (CNW) auquel il est souvent fait référence illustre bien ces points[24]. Les auteurs ont mené une enquête portant sur près de 1500 laboratoires de R-D dans le secteur manufacturier aux États-Unis. Ils ont trouvé que les entreprises doivent généralement recourir à une panoplie de méthodes pour protéger les revenus qu'ils attendent de leurs innovations. Ainsi, elles tirent parti des avantages que leur procurent le secret et de l'avance que leur confère l'innovation mais elles ont également recours aux brevets et d'autres mécanismes. Toutefois, la plupart des entreprises ont moins tendance à recourir aux brevets qu'à d'autres méthodes, alors qu'elles sont fortement tributaires des avantages que confèrent le secret et les délais de maturation[25]. En fait, en ce qui concerne les innovations de produits, les auteurs concluent que *les brevets sont incontestablement le moins important de tous les grands mécanismes d'appropriabilité* et qu'*aucun des secteurs de l'industrie ne désigne les brevets comme étant le mécanisme d'appropriabilité le plus efficace* [26]. Dans l'étude CNW, les données ont été collectées auprès de 34 secteurs.

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21 Avant de chercher à savoir quelles leçons en tirer du point de vue des politiques, Scherer lance deux mises en garde. Tout d'abord, il nous rappelle que toute innovation n'a pas la recherche de profit comme motivation première. Deuxièmement, même lorsque leur travail aboutit à un succès financier majeur, les inventeurs et les responsables de la R-D qui travaillent pour des entreprises ne touchent généralement pas une partie importante du montant total des bénéfices. En fait, la démarche qui prévaut dans les entreprises bien établies consiste plutôt à éviter le risque qu'à le rechercher. Scherer, supra note 20 p.20.

22 Id.

23 Voir Richard Levin, Alan Klevorick, Richard Nelson & Sidney Winter, "Appropriating the Returns From Industrial Research and Development," 3 Brookings Papers on Economic Activity 783 (1987); Wesley Cohen, Richard Nelson & John Walsh, "Protecting Their Intellectual Assets: Appropriability Condition and Why US Manufacturing Firms Patent (Or Not)," NBER Working Paper n°7552 (2000).

24 Cohen, et al., supra note 23.

25 Voir la section 2.5 pour plus de renseignements sur d'autres formules que les brevets.

26 Cohen, et al., supra note 23 p. 9.

Quelques secteurs ont toutefois fait état de la plus grande efficacité des brevets en matière d'innovations de produits (40 % au moins des personnes interrogées ont répondu qu'elles considéraient les brevets comme efficaces pour protéger leurs innovations). Parmi ces produits, on trouve notamment le matériel médical, les médicaments, les machines destinées à des usages particuliers, les ordinateurs et les pièces détachées automobiles. Pourtant, même les notations que ce groupe impute à l'efficacité de brevets tombent en dessous de la barre des 40 % lorsqu'elles portent sur des innovations ayant trait à des procédés, et si l'on prend la notation globale que l'ensemble des industries attribue aux innovations en matière de procédés, ce chiffre est encore inférieur à la note attribuée en matière d'innovations de produits[27].

A la lumière des conclusions de CNW, on peut se demander pourquoi on constate de plus en plus de dépôts de demande de brevets si ceux-ci n'aident pas la majorité des entreprises à protéger la rentabilité de leurs innovations. Les auteurs se sont également posés cette question, et c'est pourquoi ils ont inclus dans leur enquête des questions portant sur les raisons qui portaient les entreprises à recourir au brevetage de leurs innovations. Ce qu'ils ont trouvé, c'est que les entreprises peuvent tirer parti de la détention de brevets de plusieurs manières, et pas seulement en recueillant les bénéfices qui découlent directement de la commercialisation de l'invention ou de l'octroi de licences portant sur cette invention. Parmi les principales raisons invoquées à l'appui de la décision de faire breveter une invention, les entreprises citaient le désir 1) d'empêcher des rivaux de faire breveter des inventions connexes ; 2) de se protéger contre des actions en infractions ; et 3) d'utiliser les brevets comme éléments de marchandage dans les négociations sur les droits ayant trait à la technologie[28].

Puisque les brevets semblent stimuler une innovation considérable dans certains secteurs mais pas dans d'autres, les critiques se sont plaints que la plupart des régimes de brevets étaient généralement conçus de façon standard. Kahin affirme que *le régime des brevets s'est développé mais qu'il ne s'est pas adapté. Les programmes d'affinité et les enchères inversées ne sont pas traités de façon différente que les séquences génétiques et les diodes électroluminescentes*[29]. Ce qui le préoccupe surtout, c'est que ce qui marche bien dans certains secteurs puisse être nuisible aux résultats obtenus dans d'autres.

2.2.2 L'effet sur l'innovation des changements intervenus après 1980 dans les régimes de brevets

Bien que l'on ne dispose pas de preuves irréfutables de l'existence d'une corrélation positive entre les brevets et l'innovation, les décideurs politiques semblent d'accord pour penser qu'une telle corrélation existe. Cette conviction s'est du moins manifestée fréquemment dans des déclarations politiques aux États-Unis, au Japon et en Europe – et les Offices des brevets de ces pays délivrent environ 84 % de tous les brevets octroyés dans le monde[30]. Les autorités japonaises ont récemment adopté la devise « *chizai rikkoku* », c'est à dire, *Nation reposant sur la propriété intellectuelle,* alors qu'elles introduisaient une série de réformes visant à renforcer les droits de brevets[31]. En 2001, l'Office européen des brevets a adopté une déclaration dans laquelle il décrit la mission de l'institution comme étant « d'encourager l'innovation, la compétitivité et la croissance économique »[32]. Aux États-Unis, un responsable de l'Office des brevets

27 Id. à 10 et Tableaux 1 et 2.

28 Cohen, et al., supra note 23 p.16-24.

29 Kahin, supra note 11 p. 218.

30 Catalina Martinez & Dominique Guellec, "Overview of Recent Changes and Comparison of Patent Regimes in the United States, Japan and Europe," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 131.

31 Ichiro Nakayama, "Intellectual Property Strategy in Japan: Towards an 'IP-Based Nation'" in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 302-03.

32 Manuel Desantes, "The Patent System: Current and Future Challenges," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 310.

(PTO) qualifiait la croissance des dépôts de demande de brevets comme étant *un bienfait pour l'économie américaine* et affirmait que cela *contribuait à notre génie de l'innovation*[33]. Dans un document préparé pour une conférence de l'OCDE, un autre responsable de l'Office américain des brevets a écrit que *le gouvernement américain est convaincu qu'un régime fort en matière de brevets ... encourage la recherche et le développement et joue un rôle catalyseur pour les nouvelles technologies et les nouveaux secteurs d'activité,* et que l'un des objectifs du gouvernement américain était de *renforcer et d'étendre de façon générale les droits de la propriété intellectuelle, pour améliorer encore le niveau atteint actuellement qui est déjà très satisfaisant* [34].

Encadré 1.

Le problème posé par la mesure de l'innovation

Puisqu'ils nous portent à douter du fait que l'innovation puisse être la cause principale du brevetage, les résultats de Kortum donnent à penser que les données brutes concernant les brevets ne représentent qu'imparfaitement l'innovation. Une corrélation inférieure à 1:1 entre le nombre de brevets délivrés et les innovations effectivement réalisées ne devrait toutefois pas nous surprendre. Il est de notoriété publique que les entreprises cherchent à obtenir des brevets dans bien des circonstances et non pas seulement lorsqu'elles cherchent à protéger des contrefaçons une technologie récemment mise au point ou qu'elles cherchent à exploiter cette technologie commercialement. Ainsi, bon nombre de grandes entreprises développent leur portefeuille de brevets afin de disposer d'instruments de marchandage lors de négociations de licences ou de négociations en vue de parvenir à un règlement. D'autre part, les entreprises peuvent chercher à obtenir des brevets dans le but de bloquer les activités de développement de leurs concurrents. Les entreprises naissantes peuvent être amenées à se procurer le plus grand nombre de brevets possibles, car ceux-ci peuvent aider à convaincre des investisseurs en capital-risque de financer de jeunes entreprises. En outre, il est également bien connu que les brevets ne sont pas toujours la meilleure solution lorsque l'objectif principal est de se protéger des contrefaçons. Dans certains secteurs, les entreprises peuvent préférer privilégier le secret et l'avance que leur confère l'innovation pour maximiser les bénéfices qu'ils tirent de cette innovation. Enfin, les études ont démontré que les valeurs des brevets étaient fortement biaisées, une grande partie d'entre eux n'ayant que peu ou pas de valeur commerciale. Par conséquent, si l'on utilise le nombre de brevets délivrés comme un indicateur de l'innovation, cela peut aboutir à des surestimations ou à des sous-estimations.

Les dépenses de R-D et les dépenses de R-D en pourcentage des ventes de l'entreprises (« intensité en R-D ») sont aussi fréquemment utilisés comme étant représentatifs de l'innovation. Cependant, il s'agit également là de substituts imparfaits, car toutes les dépenses de R-D ne débouchent pas sur une innovation. Le taux auquel la R-D se traduit par des innovations réussies varie d'un secteur à l'autre et d'une entreprise à l'autre, par exemple. En outre, plusieurs entreprises peuvent s'être engagées simultanément dans les mêmes activités de R-D, ce qui fait que certaines dépenses de R-D font double emploi. D'un autre côté, certaines innovations se produisent alors que les dépenses de R-D ont été négligeables, voir inexistantes, ou du moins ces dépenses ont-elles été répertoriées comme telles dans un sens comptable. Ainsi, l'investissement dans l'innovation peut inclure des activités comme l'acquisition de matériel de haute technologie, la formation ou encore le test de produits. D'après certaines estimations, la part de ces activités dans l'ensemble des dépenses d'innovation est supérieure à 50 % dans le secteur des services, où l'adoption de nouveaux procédés, modes d'organisation et méthodes de commercialisation représentent une proportion de l'innovation supérieure à la moyenne.[*]

33 James Rogan, Remarques du Directeur de l'Office américain des brevets (US PTO), préparées pour les auditions de la Commission fédérale du commerce (FTC) du Département de la Justice (DOJ) des États-Unis sur le droit et la politique de la propriété intellectuelle dans une économie basée sur le savoir (6 février 2002), disponible à www.ftc.gov/opp/intellect/rogan.htm (cité in Martinez & Guellec, supra note 30 p. 131).

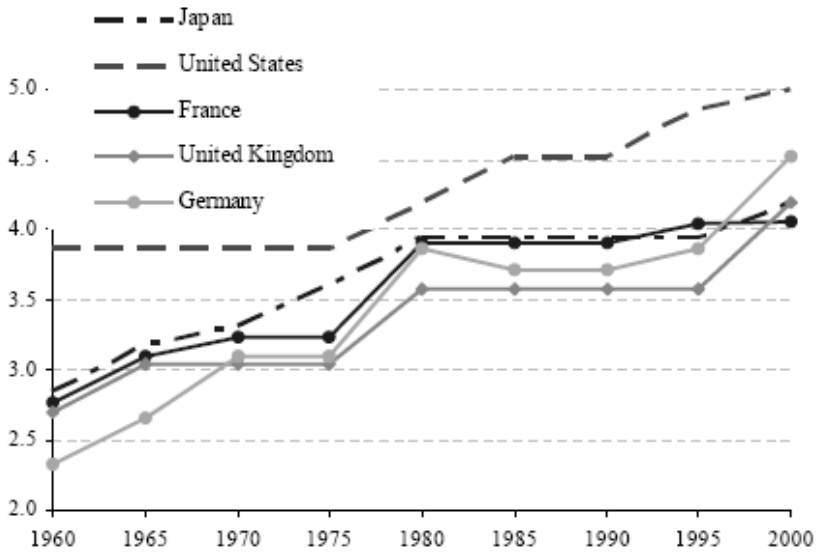
34 Lois Boland, "The Patent System: Current and Future Policy Challenges," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) p. 316.

Par conséquent, comme ce fut le cas avec les données relatives aux brevets, l'utilisation des dépenses en R-D ou de l'intensité en R-D comme indicateurs de l'innovation peut aboutir à des surestimations ou à ces sous-estimations. Aussi imparfaites que puissent être les données sur les brevets et sur la R-D en tant que substitut à l'innovation, toutes deux sont cependant largement utilisées parce qu'il est extrêmement difficile de mesurer l'innovation directement et qu'il ne semble pas y avoir de meilleures alternatives.

* OCDE, Objectif croissance (2006)

La conviction que les brevets sont une bonne chose pour l'innovation a contribué à l'avènement de changements importants dans les régimes de brevets depuis 25 ans environ. La plupart de ces changements ont contribué à l'instauration de régimes plus forts, en renforçant les droits exclusifs conférés aux détenteurs de brevets et en étendant le champ des revendications intellectuelles couvert par les brevets. (Voir Tableau 1.) L'harmonisation entre pays de l'OCDE s'est développée dans la mesure où ces pays ont généralement accepté l'idée que des brevets faciles à faire respecter et dont les détenteurs avaient des droits étendus étaient propices à l'innovation[35].

Tableau 1. Indice de force des brevets, 1960-2000



Source: Martinez & Guellec, *supra* note 30 à 132. Les valeurs de l'indice varient de 0 à 5, 5 indiquant le plus haut niveau de force d'un brevet.

Les ajustements qui ont été apportés aux régimes des brevets de différents pays ont fourni l'occasion de tester la corrélation qui existe entre brevets et innovations, en examinant les changements survenus dans l'activité innovante depuis la mise en œuvre des nouvelles politiques.

Les changements de politiques

En général, les droits de brevets ont été élargis et renforcés de la façon suivante[36] :

35 Martinez & Guellec, supra note 30.

36 Ce résumé des changements s'inspire de Martinez & Guellec, supra note 30 p.128-29.

- *Le champ que recouvrent les brevets s'est étendu à de nouveaux domaines.* Des domaines qui se situaient auparavant hors du champ de brevetabilité sont maintenant de plus en plus protégés, en particulier les inventions liées aux services, telles les logiciels et les méthodes d'affaires. Les brevets sont aussi délivrés plus fréquemment au titre de technologies relevant de la recherche fondamentale, notamment dans le domaine de la biotechnologie.

- *La portée des brevets individuels, en particulier de ceux délivrés dans de nouveaux domaines s'est étendue.* Les revendications auxquelles donnent lieu les brevets dans de nouveaux domaines ont souvent tendance à être plus étendues que celles auxquelles donne lieu des domaines couverts de plus longue date. Les inventions pionnières dans le domaine des technologies émergentes ont tendance à être de plus grande portée que les inventions induites. Certaines pratiques en matière de brevetage telles que le recours à des « reach-through claims » [*revendications en aval*] en matière de biotechnologie peuvent étendre la protection à tout un éventail d'applications encore inconnues au moment du brevetage[37]. En outre, l'adoption de la doctrine des équivalents dans les procès en infraction de brevets peut avoir contribué à l'élargissement de la portée des brevets dans certains pays. En vertu de cette doctrine, une invention qui exerce la même fonction, de la même manière et en vue du même résultat qu'une invention brevetée, seraient jugée comme portant atteinte à un brevet, en dépit de toutes différences littérales avec les revendications du brevet. La doctrine des équivalents a été adoptée dans toute l'Europe, au Japon et aux États-Unis.

- *Les droits attachés aux brevets sont réaffirmés plus fréquemment et les tribunaux leur reconnaissent une plus grande valeur.* Dans tous les pays de l'OCDE, les détenteurs de brevets remportent plus souvent les procès pour infraction et se voient attribuer des sommes plus importantes au titre des dommages encourus. Depuis la création de la Cour d'appels du Circuit fédéral (CAFC) en 1982, le nombre de brevets invalidés par la justice a diminué aux États-Unis.

- *Les exemptions au titre de la recherche sont restreintes.* Les décisions judiciaires rendues récemment aux États-Unis restreignent l'applicabilité des exemptions de recherche dans les cas de violation de brevets. Les régimes de brevets de la plupart des pays reconnaissent une exception à l'engagement de la responsabilité d'une partie pour atteinte à un brevet lorsque les inventions brevetées sont utilisées à des fins expérimentales ou de recherche. Certains tribunaux ont opté pour une interprétation étroite de l'exemption et le CAFC a statué que cela ne recouvre que « les actions réalisées à des fins de divertissement, en vue de satisfaire une curiosité désoeuvrée, ou des recherches strictement philosophiques.»[38]

Aux États-Unis, dès 1980, une série d'actes judiciaires, législatifs et administratifs et d'accords internationaux ont étendu le brevetage aux technologies situées en amont (essentiellement la biotechnologie) et à d'autres domaines qui jusqu'alors ne remplissaient pas les conditions requises pour bénéficier de la protection de la propriété intellectuelle (logiciel et méthodes d'affaires.) Une autre avancée a été la création d'une Cour fédérale spéciale (la CAFC), en 1982, chargée d'entendre en appel les cas de violation de brevets. La création de la CAFC est généralement considérée comme étant l'un des changements les plus importants qui soit survenu ces dernières années dans le régime des brevets

37 Les accords de licence « Reach-through » calculent le montant des redevances en fonction des bénéfices générés par un produit venant en aval, que celui-ci ait eu recours ou non à la technologie ayant fait l'objet de la licence. Pour plus de détails sur les accords de licence « reach-through » dans le secteur de la biotechnologie, voir OCDE, DAF/COMP(2004)24, Intellectual Property, Background Note 34-36.

38 Madey v. Duke University, 307 F.3d 1351, 1362 (Fed. Cir. 2002).

américains[39]. Plusieurs décisions de la Cour ont étendu la définition de ce qui est brevetable. Les décisions de la CAFC ont également renforcé les droits des détenteurs de brevets en limitant les cas d'invalidation de brevets et en relevant le montant des sommes attribuées dans les cas de violation de brevets.

D'autres changements survenus aux États-Unis sont venus renforcer la positon du détenteur de brevet vis à vis des contrefacteurs éventuels et ont incité les universités à commencer à utiliser le régime des brevets. Le passage de la loi Bayh-Dole a permis aux universités d'obtenir des brevets au titre d'inventions ayant bénéficié d'un financement fédéral et certaines universités se sont montrées très déterminées à faire appliquer ces nouveaux droits. Dans le passé, certaines des nouvelles technologies ainsi créées seraient tombées sous la rubrique « recherche fondamentale » et non sous la rubrique «inventions brevetables. » Cette nouvelle moisson de brevets a suscité un regain d'inquiétude au sujet des « anticommuns », d'autant plus que la R-D universitaire est très axée sur la création d'outils de recherche en amont, qui est ce dont d'autres inventeurs ont besoin.

Des réformes favorables aux brevets ont également été mises en oeuvre au Japon, surtout, à partir de la fin des années 80. Elles ont abouti à a) étendre le domaine du brevetable, notamment par l'introduction de brevets liés aux gènes et de brevets sur les logiciels ; b) augmenter le nombre des revendications auxquelles donnent droit chaque brevet ; c) inciter davantage les universités à faire breveter leurs inventions et à les offrir sous licence, et d) renforcer les droits de brevets, notamment en augmentant les sommes attribuées au titre de dommages dans les cas d'infraction de brevets portés en justice et en limitant l'incidence des licences obligatoires[40].

Le Japon a également pris des mesures en vue de créer des tribunaux spécialisés dans les cas de DPI. Entre 1997 et 2002, le Japon a accru le nombre de tribunaux, de juges et d'enquêteurs judiciaires spécialisés dans le domaine de la propriété intellectuelle à la Haute Cour de Tokyo, à la Cour du District de Tokyo et à la Cour de District d'Osaka[41].

L'impulsion qui a abouti à ces réformes s'est poursuivie lorsque les autorités ont publié, en juin 2003, un document intitulé Cadre stratégique des politiques en matière de propriété intellectuelle. L'objet de ce Cadre est d'améliorer la compétitivité industrielle en favorisant la création de droits de propriété intellectuelle, leur utilisation et leur renforcement. Parmi les éléments-clés de ce dispositif, citons des mesures visant à concéder des droits de propriété intellectuelle dans de nouveaux domaines tels que la biotechnologie et les technologies de l'information, et à protéger ces droits. En outre, les pouvoirs publics ont adopté la devise « *chizai rikkoku »* (Nation fondée sur la propriété intellectuelle)[42].

Kazuyuki Motohashi affirme que les changements intervenus dans la démarche japonaise sont dus en bonne partie à la conviction que la revitalisation de la compétitivité américaine dans les années 80 est largement imputable à des politiques favorables aux brevets[43]. En fait, la raison d'être de la plupart des réformes qui ont bénéficié aux brevets dans les pays de l'OCDE, c'est que des régimes de brevets forts passent pour amener d'importants avantages économiques puisqu'ils sont censés attirer les investissements directs étrangers, renforcer les incitations à investir en R-D et stimuler l'innovation. Un rapport de l'OCDE

39 Voir, Jaffe & Lerner, supra note 5 (où il est dit que la création de la CAFC constitue l'un des plus grands changements dans la politique américaine des brevets et dans sa pratique depuis1836.)

40 Pour plus de details sur les réformes japonaises, voir Kazuyuki Motohashi, "Japan's Patent System and Business Innovation: Reassessing Pro-Patent Policies," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

41 Martinez & Guellec, supra note 30 p. 136.

42 Nakayama, supra note 31 p. 302-03.

43 Motohashi, supra note 40 p. 54.

conclut cependant que « des politiques favorables aux brevets ont été mises en place sans qu'il soit beaucoup tenu compte de leurs effets sur la concurrence ou sur la diffusion du savoir, questions importantes qui méritent d'être étudiées de façon plus approfondie[44].»

Les effets des changements de politique sur l'innovation

Plusieurs spécialistes ont mené des analyses empiriques pour aider à faire la lumière sur les effets des mesures de renforcement des brevets. On peut penser que si l'on observe des taux d'innovation élevés, depuis l'introduction des changements, cela tend à démontrer qu'il existe une corrélation positive entre le renforcement des droits de brevets et l'augmentation des innovations. Toutefois, il y a étonnamment peu de preuves permettant de dire que la délivrance d'un plus grand nombre de brevets et le renforcement des droits qu'ils confèrent ont entraîné des avantages allant au-delà de quelques secteurs, comme ceux des produits pharmaceutiques, des produits chimiques et des appareils médicaux. Par contre, les inquiétudes auxquelles donnent lieu le régime des brevets et les critiques formulées à l'égard de la manière dont il fonctionne semblent être de plus en plus nombreuses.

Une étude, fondée sur des régressions de données calculées à partir d'un échantillon de 20 pays de l'OCDE sur une période de vingt ans, allant de 1982 à 2001, conclut que le renforcement des DPI contribue à une augmentation notoire du nombre de brevets délivrés, mais qu'il n'a que peu d'effets directs sur les dépenses de R-D. Une augmentation d'une unité de l'indice de DPI du modèle (équivalent en gros, aux changements qui se sont réellement produits durant la période sur laquelle portait l'échantillon dans de nombreux pays) était associée à une augmentation de seulement 5 % des dépenses de R-D mais devait, selon les estimations, contribuer à une augmentation du nombre total de brevets de plus de 30 %[45]. En fait, dans certaines circonstances, le renforcement des DPI semblait plutôt *réduire* les dépenses de R-D :

> La principale conclusion à laquelle nous permettent d'aboutir ces estimations empiriques, c'est qu'il est difficile de dire que l'indice des DPI a un effet marqué et bien précis sur l'intensité en R-D, dès lors que l'on tient compte d'autres facteurs explicatifs. . . Certains éléments donnent à penser que des niveaux de DPI plus élevés ont un effet négatif considérable sur la R-D lorsque la pénétration des importations est forte, peut-être en raison du fait qu'une forte protection de la PI empêche les avantages de la concurrence de se faire tous pleinement sentir, mais il y a peu de preuves directes que cela soit important en soi[46].

Des études portant plus particulièrement sur des secteurs donnés ont également mis en doute les liens qui existent entre innovation et droits de brevets élargis. Ainsi, une étude empirique de James Bessen et Robert Hunt, remet en question l'affirmation selon laquelle le fait de rendre les logiciels brevetables augmenterait l'incitation à innover. Globalement, l'étude conclut qu'il n'y a pas de corrélation étroite entre les brevets de logiciels et la création de programmes informatiques. En fait, les données font apparaître que la vaste majorité des brevets de logiciels est obtenue par des entreprises qui n'appartiennent pas au secteur des logiciels[47].

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44 OCDE, Patents, Innovation and Economic Performance, Conference Proceedings, OCDE, à la p. 14 (2004).

45 Florence Jaumotte & Nigel Pain, "From Ideas to Development: The Determinants of R&D and Patenting," OCDE, ECO/WKP(2005)44, Document de travail Du département des affaires économiques n°457 p. 49 (2005).

46 Id. at 20; voir également Jaumotte & Pain, supra note 2 p. 40.

47 James Bessen & Robert Hunt, "The Software Patent Experiment," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

Bessen et Hunt constatent qu'après que l'Office américain des brevets et des marques (PTO) a révisé ses directives sur les inventions liées à l'informatique, vers le milieu des années 90, pour faciliter l'obtention de brevets portant sur des logiciels, le nombre des brevets de cette nature a considérablement augmenté. Mais dans ce cas, les données brutes relatives aux brevets ne permettent pas de saisir toute la vérité sur l'innovation. Pour savoir la vérité, les auteurs ont commencé par chercher à savoir qui étaient ceux qui se voyaient octroyer des brevets logiciels. Ils ont constaté que l'entreprise médiane dans une liste d'entreprises classées en fonction du nombre de brevets logiciels qu'elles détiennent a une valeur marchande deux fois supérieure à celle du titulaire de brevet se situant au milieu d'une liste similaire pour d'autres types d'inventions. En d'autres termes, les titulaires de brevets logiciels sont de relativement grandes entreprises. Ensuite, ils ont découvert que de 1994 à 1997, les entreprises situées dans le secteur des logiciels n'avaient reçu que 7 % de tous les brevets de logiciels délivrés aux États-Unis. Cette statistique surprenante a été suivie d'une autre statistique tout aussi surprenante : trois brevets logiciels sur quatre étaient délivrés à une entreprise industrielle[48].

Les auteurs ont ensuite cherché à savoir si les entreprises qui faisaient ainsi breveter leurs logiciels étaient réellement innovantes. Ils ont constaté que les fabricants de machines, d'appareils électroniques et d'équipement n'employaient que 6 % de l'ensemble des programmeurs informatiques aux États-Unis, alors que deux brevets logiciels sur trois octroyés leur étaient imputables. Par ailleurs, 90 % des programmeurs étaient employés en dehors du secteur industriel, mais pris ensemble, ils n'obtenaient qu'un quart des brevets logiciels. Par conséquent, Besson et Hunt en ont dégagé l'impression que les brevets logiciels traduisaient quelque chose d'autre que la création de logiciels[49].

Poursuivant encore leurs recherches, les auteurs ont commencé à étudier la propension à faire breveter dans différentes branches d'activité. C'est à dire qu'ils ont étudié le nombre moyen de brevets obtenus pour un montant donné de dépenses de R-D. Ils ont constaté que les entreprises industrielles affichaient des propensions beaucoup plus élevées à faire breveter que ne le faisaient les entreprises de logiciels. Très précisément, les entreprises spécialisées dans la fabrication de machines, d'appareils électroniques et d'équipement bénéficiaient de 4 à 10 fois plus de brevets pour tout niveau donné de R-D que n'en avaient les entreprises de logiciels. Par conséquent, il semble que le secteur dans lequel opère une entreprise détermine davantage son activité en matière de brevetage que ne le fait la R-D. Pourquoi cela ?

Bessen et Hunt pensent que la réponse tient au fait que dans les années 90, toute chose étant égale par ailleurs, plus la part des brevets logiciels était importante parmi les nouveaux brevets détenus par une entreprise, plus l'intensité en R-D de l'entreprise était faible. En d'autres termes, plus une entreprise faisait porter ses efforts sur l'obtention de brevets logiciels *moins* elle faisait de dépenses pour développer de nouveaux produits et de nouveaux procédés. Cette anomalie peut s'expliquer du fait de certains comportements stratégiques en matière de brevetage, comportements qui peuvent se produire dans les situations de maquis de brevets. Concrètement, lorsqu'un logiciel devient brevetable, cela ouvre de nouvelles frontières et les entreprises qui avaient déjà constitué un portefeuille de brevets pour l'effet de levier qu'elles en retirent peuvent ainsi renforcer encore leurs positions dans les négociations. Le plus souvent, ces entreprises ne sont pas des entreprises de logiciels mais plutôt des entreprises industrielles et il se peut qu'elles aient ajouté des brevets de logiciels à leur panoplie aux fins d'intimider des nouveaux entrants potentiels, de faire payer des redevances à des concurrents ou de se protéger eux-mêmes contre des procès en infraction. La concurrence peut se porter sur le terrain des brevets plutôt que sur celui des inventions lorsque les entreprises utilisent des techniques similaires et qu'il est relativement peu cher d'amasser un vaste portefeuille de brevets. Dans ce genre d'environnement, c'est à qui taxera les

48 Id. p. 250-51.

49 Id. p. 251-52.

inventions de l'autre entreprise. Naturellement, les entreprises rivales ont tendance à être d'autant moins incitées à se lancer dans la R-D.

Quoiqu'il en soit, étant donné l'énorme croissance des brevets logiciels à la fin des années 90, l'impact sur la R-D, à l'échelle de l'ensemble de l'économie, de la décision d'autoriser la brevetabilité des logiciels a été considérable. Les conclusions de Bessen et Hunt, si elles sont prises littéralement, impliquent que même si le nombre de brevets logiciels n'avait cru qu'au même taux que celui de tous les autres brevets après 1991, l'intensité moyenne en R-D dans les entreprises américaines aurait été environ sept fois plus importante en 1997. Cela veut dire qu'environ 9 milliards USD n'ont jamais été dépensés par le secteur privé au titre de la R-D[50]. Ce chiffre serait plus élevé encore si les brevets de logiciels n'avaient pas été autorisés aux États-Unis. Toutefois, il y a lieu de rappeler qu'il s'agit là d'une extension très littérale des conclusions auxquelles sont parvenus Bessen et Hunt.

Il n'y a pas que dans le domaine du logiciel que les entreprises amassent des brevets aux fins d'accroître leur portefeuille de brevets et de renforcer ainsi leur position à la table des négociations. En 2001, Hall et Ziedonis ont trouvé que le même schéma se reproduisait dans le secteur des semi-conducteurs où le taux de brevetage a doublé en dix ans. Les auteurs sont parvenus à la conclusion que cette augmentation traduisait les efforts réalisés par les entreprises pour assembler de vastes portefeuilles de brevets aux fins de contrecarrer ou de retarder des stratégies de blocage de l'innovation (ou « hold-up ») mises en place par des rivaux qui détiendraient d'autres techniques nécessaires à la fabrication de puces de semi-conducteurs[51].

Motohashi trouve ironique que les réformes favorables aux brevets qui ont été mises en place au Japon aient été justifiées, du moins partiellement, par la conviction que des réformes similaires avaient contribué à relancer l'innovation aux États-Unis. Comme il le fait observer à juste titre, même aux États-Unis, les opinions sont divisées sur le point de savoir si les mesures visant à élargir et à renforcer les droits de brevets ont ou non un effet notable sur l'innovation commerciale, et un grand nombre d'études empiriques démontrent que des politiques favorables aux brevets n'ont que des effets marginaux sur l'innovation commerciale[52].

Motohashi a également réalisé de son côté une étude, évaluant l'impact des réformes japonaises en matière de brevets sur l'activité innovante et à cette fin, il a eu recours à des données statistiques, à des données provenant d'une enquête menée au niveau des entreprises et à des informations recueillies lors d'entrevues avec les responsables de la propriété intellectuelle dans des entreprises de technologie de l'information et dans des entreprises pharmaceutiques. Il a découvert que les mesures mises en oeuvre aux fins de renforcer les droits de brevets, notamment l'augmentation des compensations octroyées dans le cadre des recours en infraction de brevets, n'étaient pas perçues par les entreprises comme ayant un impact notable sur leurs activités innovantes[53]. S'il est bien vrai qu'il y a eu une croissance importante du nombre de brevets japonais délivrés à la fin des années 90, on ne peut pas en déduire pour autant que cette croissance reflète une augmentation aussi importante de l'innovation parce qu'en elle-même, la croissance globale des brevets n'explique pas tout. Lorsque les données ont été regroupées par branche d'activité, on a

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50 Id. p. 255.

51 Bronwyn Hall & Rosemarie Ziedonis, "The Determinants of Patenting in the U. S. Semiconductor Industry, 1980-1994," 32 Rand Journal of Economics 101 (2001).

52 Motohashi, supra note 40 à 54 (citant Samuel Kortum & Josh Lerner, "What Is Behind the Recent Surge in Patenting?", 28 Research Policy 1 (1999); Bronwyn Hall & Rosemary Ziedonis, "An Empirical Study of Patenting in the US Semiconductor Industry, 1979-1995," 32 Rand Journal of Economics 101 (2001); Josh Lerner, "Patent Protection and Innovation Over 150 Years," NBER Working Paper Series, n°8977 (2002).

53 Motohashi, supra note 40.

pu constater qu'une grande partie de l'augmentation était imputable à la biotechnologie et aux logiciels, deux domaines qui venaient seulement récemment d'être admissibles à bénéficier de la protection de brevets au Japon. Cela donne à penser que l'augmentation du brevetage était moins le fait d'un accroissement de l'innovation que de la nouvelle possibilité qui s'offrait aux entreprises d'obtenir des brevets sur des innovations qui se produisaient de toute façon par ailleurs. En fait, Motohashi constate que l'extension à de nouveaux secteurs du champ de la protection conférée par les brevets semble avoir eu plus d'effets sur le nombre de dépôts de demande de brevets que certaines mesures de renforcement des brevets comme l'augmentation des montants attribués à titre de dommages pour infraction à un brevet[54].

A l'appui de sa conclusion, Motohashi décrit les résultats découlant d'une série d'entrevues avec des membres d'entreprises japonaises se spécialisant dans les technologies de l'information. Les entrevues montrent que le seul changement de politique qui ait eu un effet important sur leurs activités de brevetage a été l'extension de la brevetabilité à de nouveaux domaines, tels les logiciels et les méthodes d'affaires. L'activité en matière de R-D – un autre indicateur imparfait mais utile de l'innovation – n'a pas été affectée non plus outre mesure par les mesures adoptées en vue de renforcer les brevets. En fait, pas une seule entreprise n'a indiqué que ses dépenses de R-D avaient été stimulées par de telles mesures[55].

Un élément positif du renforcement des droits de brevets qui ressort de l'étude de Motohashi, c'est qu'une telle évolution ne semble pas avoir créé un problème d'anticommuns dans le secteur des industries pharmaceutiques japonaises. Ce secteur est perçu comme étant parmi les plus susceptibles de développer ce genre de problème, parce qu'il est fortement tributaire d'outils de recherche ayant été brevetés en amont, outils qui facilitent la découverte et l'efficacité de produits en aval. Les entreprises pharmaceutiques japonaises ont indiqué que même si les coûts liés à l'obtention de licences étaient en augmentation en raison du plus grand nombre de licences octroyées au titre de technologies situées en amont, cela n'a pas encore induit de changements dans leurs stratégies de R-D. Cependant, un grand nombre d'entreprises ont apparemment fait connaître leur préoccupation de voir un problème d'anticommuns se manifester par la suite, parce qu'il est désormais possible d'obtenir des brevets sur des outils de recherche et sur des gènes qui n'étaient pas brevetables auparavant[56].

2.3 Le point de vue « réformiste »

Le renforcement des droits conférés par les brevets n'ayant apparemment pas réussi à stimuler l'innovation, certains chercheurs en ont logiquement conclu qu'il convenait de repenser les orientations. Lemley, par exemple, estime qu'en renforçant ces droits depuis quelques années les pouvoirs publics ont perdu de vue que les brevets devaient au départ constituer une exception limitée au paradigme dominant, à savoir la concurrence. Les instances juridiques, législatives et certains commentateurs se sont mis à considérer les droits de propriété intellectuelle (DPI) comme en soi bénéfiques[57]. Ayant conclu qu'une certaine protection de la propriété intellectuelle est utile car elle encourage l'innovation, ils ont pensé qu'il serait bon de l'accroître. D'après Lemley, ils ont fini par croire que les inventeurs ne sont pas motivés s'ils n'ont pas le droit de s'approprier la valeur sociale totale de leurs inventions. Ils ont donc voulu instaurer une protection absolue.

Lemley, quant à lui, juge mal fondées les initiatives visant à permettre aux inventeurs de conserver toute la valeur sociale de leurs innovations. Il estime en effet que la crainte des « passagers clandestins »[58]

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54 Id. p. 61.

55 Id. p. 69.

56 Id. p. 72, 76.

57 Mark Lemley, "Property, Intellectual Property, and Free Riding," 82 Texas Law Review 1031 (2005).

58 Les « passagers clandestins » exploitent les fruits d'un investissement sans en partager les coûts.

qui les sous-tend fréquemment s'appuie en fait sur un postulat erroné, à savoir que la propriété intellectuelle n'est pas différente de la propriété réelle[59]. On estime en effet traditionnellement que les détenteurs de propriété réelle n'y investissent pas un montant optimal si des tiers sont à même d'exploiter cet investissement en tant que « passagers clandestins ». Si l'on applique ce principe à la propriété intellectuelle, les inventeurs ne souhaiteraient donc pas investir un montant optimal dans la création d'inventions nouvelles si les passagers clandestins sont tolérés. On admet généralement que la valeur sociale d'une innovation est plus grande que sa valeur privée. Les partisans d'un renforcement des brevets sont d'avis qu'il existe certainement trop de passagers clandestins exploitant les investissements des innovateurs et que les DPI ne sont donc pas encore suffisamment protégés.

Pendant une bonne partie de son existence, le droit de la propriété intellectuelle a laissé une grande latitude aux passagers clandestins. Il prévoyait des limites quant à l'objet et à la durée de la protection conférée, ainsi que des dérogations pour certaines utilisations. Afin d'exclure totalement les passagers clandestins, il a fallu toutefois resserrer les mailles du dispositif. Les tribunaux convaincus que la propriété intellectuelle était analogue à la propriété réelle ont donc décidé d'éliminer totalement ce phénomène et ont ainsi au cours des trente dernières années limité ou supprimé bon nombre des lacunes ou dérogations du système. Le domaine des DPI s'est donc considérablement élargi.

Lemley réfute toutefois « l'idée que les détenteurs de propriété intellectuelle doivent pouvoir capter toute la valeur sociale de leurs inventions car elle va à l'encontre des intuitions économiques que nous pouvons avoir dans tous les autres secteurs de l'économie[60]. Selon lui, dans un système de marché, la situation optimale est qu'un vendeur gagne juste assez d'argent pour couvrir ses coûts, en réalisant un bénéfice raisonnable. Si certains consommateurs sont disposés à payer plus que le prix du marché pour un bien ou si d'autres bénéficient de la production des biens, le marché fonctionne de façon satisfaisante. Si la société souhaitait en fait que tous les producteurs puissent internaliser toutes les externalités positives dérivant de leurs produits, il n'existerait pas d'« agences de la concurrence » mais des « agences de monopole ou de cartel » puisque les pouvoirs publics favoriseraient alors ce type de structure. Même le droit de la propriété réelle, indique Lemley, ne permet pas aux propriétaires d'engranger toutes les externalités positives. Si un propriétaire plante de belles fleurs dans son jardin, les passants en bénéficient mais il ne peut capter la valeur de ce plaisir en leur demandant un paiement. Les externalités positives sont d'ailleurs multiples et il serait impossible avec la meilleure volonté du monde de les internaliser toutes. Lemley conclut que « si les passagers clandestins tirent un avantage de l'investissement d'un tiers, la loi ne peut ni ne doit l'interdire. Si le coût social marginal de ce bénéfice est nul, l'interdiction impose des coûts sociaux inutiles »[61].

À ce stade, Lemley paraît avoir poussé l'argument trop loin. Il semble s'en tenir à une vue purement statique des incitations et de l'efficience, sans considérer les effets dynamiques. Autrement dit, il semble oublier que la possibilité de produire des copies d'invention et de les vendre peut d'emblée démotiver l'inventeur. En termes dynamiques, il s'agit manifestement d'« un coût social de l'exploitation du bien créé

59 James Langenfeld réfute également cette idée dans son article « Intellectual Property and Antitrust: Steps Toward Striking a Balance », 52 Case Western Reserve Law Review 93-99 (2001) ; voir aussi Richard Gilbert et Willard Tom : « Is Innovation King at the Antitrust Agencies? The Intellectual Guidelines Five Years Later », 69 Antitrust Law Journal 43, 47 n.8 (2001) ; mais voir US DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property section 2.0 (où on lit en substance : au titre de l'analyse antimonopole, les agences considèrent la propriété intellectuelle comme essentiellement comparable à toute autre forme de propriété) ; Richard Gilbert, « New Antitrust Laws for the 'New Economy ?' », témoignage devant l'Antitrust Modernization Committee, 9 (8 novembre 2005) (qui soutient le même point de vue).

60 Lemley, supra note 8, 1046.

61 Id., 1049.

par un tiers ». Mais pour Lemley, les passagers clandestins ne doivent être ni totalement exclus ni complètement tolérés. Parfaitement conscient de l'importance des effets et des incitations dynamiques, il comprend que les inventeurs doivent pouvoir tirer profit de leurs inventions. Mais quel profit ? Un montant juste suffisant pour couvrir les coûts, la totalité de l'excédent de valeur sociale, ou un montant intermédiaire ?

Langenfeld pulvérise aisément l'idée de donner aux inventeurs la totalité de la valeur sociale : dans ce cas en effet, le reste de la société ne bénéficierait pas des innovations, qui ne stimuleraient pas l'économie en accroissant la productivité mais ne feraient qu'enrichir les inventeurs[62]. Lemley est d'avis que le droit de la propriété intellectuelle doit faire en sorte que les inventeurs puissent percevoir des prix leur permettant de recouvrer leurs coûts totaux moyens. Aucun des principes théoriques de l'économie n'en justifie davantage. À vrai dire, les lois, renforcées, en vigueur actuellement, ne peuvent pas même garantir ce montant, ni a fortiori aller au-delà. Absolument rien ne garantit en effet qu'un produit ou un procédé breveté va valoir quelque chose aux yeux du marché, en sorte que les inventeurs risqueront toujours de ne pas rentrer dans leurs coûts. Mais l'argument de Lemley est qu'un système favorisant le recouvrement des coûts est suffisant et qu'il n'est donc pas nécessaire d'adopter des mesures permettant une rémunération plus élevée. Il n'est pas interdit de se demander dans ce cas qui va prendre la peine d'inventer si la seule récompense est le recouvrement des coûts ? Une meilleure rémunération ne stimulerait-elle pas l'innovation ?

Les réponses à ces questions semblent heureusement se trouver dans les données. Hormis pour quelques secteurs, nous avons vu que les brevets ne sont pas la motivation principale des inventeurs et le renforcement des lois sur les brevets n'a pas accru l'innovation, autant qu'on puisse en juger. Tant que quelques innovations permettent de décrocher des profits fabuleux, les inventeurs paraissent disposer à tenter leur chance pour se joindre à ce petit groupe de privilégiés, alors que la plupart recouvreront tout juste, ou pas même, leur mise de fonds. Autrement dit, les données semblent appuyer Lemley. Et comme nous l'avons constaté, le renforcement de la protection des brevets n'est pas sans entraîner certains coûts. Sa position semble ainsi parfaitement fondée : les DPI ne se justifient que jusqu'au seuil où ils permettent aux inventeurs de créer, et la valeur sociale excédentaire se situe bien au-delà de ce seuil.

2.4 Possibilités de coordination entre les responsables de la concurrence et de la propriété intellectuelle en vue d'améliorer le système des brevets

Divers experts ont proposé de multiples mesures devant permettre aux brevets de stimuler l'innovation tout en facilitant la diffusion des progrès techniques. Beaucoup s'attachent à améliorer la « qualité » des brevets, estimant que les offices des brevets doivent soumettre les demandes à un examen plus rigoureux en veillant à ce qu'elles respectent les normes relatives à la « brevetabilité » et à l'étendue de la protection accordée. Concrètement, ils suggèrent d'augmenter le budget de ces offices pour qu'ils puissent recruter davantage d'examinateurs, de puiser dans les connaissances des entreprises et chercheurs privés en leur permettant davantage de contester les brevets après leur délivrance, et d'améliorer la coordination internationale[63]. Mais quelle contribution peuvent apporter les autorités de la concurrence à cet égard ?

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62 Langenfeld, supra note 59, 96-97.

63 OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) ; US Federal Trade Commission, "To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy," (2003) ; Stephen Merrill, "Improving Patent Quality: Connecting Economic Research and Policy," in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004) ; Shapiro, supra note 4 ; Bronwyn Hall, Dietmar Harhoff, Stuart Graham et David Mowery, "Prospects for Improving US Patent Quality via Post-Grant Opposition," Université de Californie, Berkeley, Competition Policy Center paper CPC03038 (2003) ; Jaffe et Lerner, supra note 5.

Cette interrogation a été soulevée en 2004 lors d'une table ronde portant sur la biotechnologie, mais les suggestions qu'elle a suscitées sont valables pour l'ensemble des systèmes de brevets. Pour plusieurs raisons, dont le manque de compétences techniques spécialisées et de ressources, il ne paraît guère souhaitable que les autorités de la concurrence interviennent dans le premier examen des dépôts de brevets. Les délégués ont en fait proposé diverses autres façons dont ces agences peuvent aider les offices responsables à améliorer eux-mêmes la délivrance des brevets : d'une part engager un dialogue interdisciplinaire avec les agents des brevets afin que les spécialistes parviennent à une meilleure compréhension de leurs domaines respectifs, d'autre part charger des experts d'étudier si les systèmes de brevets de divers pays provoquent des effets indésirables et de quelle façon, et enfin organiser des séminaires ou auditions auxquels universitaires, professionnels du secteur public et privé et représentants de l'industrie pourraient s'entretenir des difficultés des politiques de la propriété intellectuelle et des actions correctives possibles[64]. Certains chercheurs, eux aussi, aimeraient que les responsables de la concurrence et des brevets se réunissent régulièrement pour des échanges de vues et d'informations sur la question de savoir si les brevets ont des effets bénéfiques et s'il serait possible d'améliorer la situation en relaxant ou en renforçant au contraire les principes et les procédures d'examen[65].

Cette façon de procéder est vraisemblablement la bonne pour les autorités de la concurrence. On peut en effet douter de leur aptitude à concevoir et mettre en œuvre une politique des brevets mais il est manifeste qu'elles peuvent apporter des commentaires et suggestions utiles. Il est dans l'intérêt de l'ensemble de la société qu'elles le fassent car les offices des brevets ont plutôt tendance à considérer l'intérêt de leur clientèle (détenteurs et dépositaires de brevets), alors que les agences de la concurrence s'attachent à améliorer le bien-être de tous les consommateurs[66]. Plusieurs de ces agences ont d'ailleurs déjà prouvé qu'elles peuvent apporter une contribution précieuse au dialogue sur la façon d'améliorer les systèmes des brevets[67]. Aux États-Unis, la Commission fédérale du commerce (FTC) et le ministère de la justice (DOJ) ont notamment organisé il y a quelques années des auditions communes sur la politique de la concurrence et des brevets. La FTC a présenté dans son rapport des suggestions concrètes pour améliorer la qualité des brevets et atténuer le plus possible l'incidence anticoncurrentielle du système des brevets. Ces recommandations s'adressaient au Congrès, aux tribunaux et au Patent and Trademark Office[68]. La FTC, poursuivant sur sa lancée, a coparrainé un colloque sur la réforme des brevets et une série de « réunions en ville » en 2005[69]. Ces réunions se sont tenues dans diverses villes des États-Unis afin d'obtenir l'avis des professionnels, des inventeurs et du public sur diverses propositions de réforme des brevets.

Les agences de la concurrence pourraient agir plus directement en se prévalant des lois en vigueur dans ce domaine pour réduire ou supprimer le pouvoir parfois obtenu sur le marché grâce à des brevets qui n'auraient jamais dû être accordés au regard des normes juridiques de la propriété intellectuelle. Dans les pays de l'OCDE, de nombreuses entreprises ont été contraintes de concéder des licences sur leur propriété

64 Voir OCDE, DAF/COMP(2004)24, Intellectual Property, Executive Summary, p. 7.

65 Voir par ex. Langenfeld, supra note 59, 108.

66 Shapiro, supra note 4, 1022 et note 12.

67 Voir généralement OCDE, DAF/COMP(2004)24, Intellectual Property.

68 FTC (US), To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (2003). Ce rapport se base sur des auditions communes de la FTC et du DOJ tenues pendant 24 jours en 2002.

69 Voir Deborah Platt Majoras, allocution, colloque sur la réforme des brevets, coparrainé par la FTC, le National Academies Board on Science, Technology and Economic Policy, et l'American Intellectual Property Law Association (9 juin 2005), à consulter sur www.ftc.gov/speeches/majoras/050609comppolicy.pdf .

intellectuelle après s'être trouvées en infraction à une loi sur la concurrence[70]. Mais lorsqu'un détenteur de brevet ne souhaite pas accorder de licence à quiconque, contraindre l'entreprise à le faire n'est peut-être pas la meilleure méthode à adopter pour une agence de la concurrence. Comme l'indique Shapiro,

> lorsqu'une entité privée se voit accorder un brevet… donnant au détenteur des droits exclusifs sur une certaine propriété intellectuelle, et que les dispositions antimonopole sont interprétées comme exigeant l'octroi d'une licence à des tiers, l'action publique et la loi sont déroutantes et contradictoires. Non seulement l'obligation de concéder licence empiète sur les droits exclusifs qui avaient été accordés, mais elle soulève le problème épineux des *termes et conditions* dans lesquels ces licences doivent être octroyées…
>
> D'un point de vue économique, l'obligation de concéder licence imposée à ceux dont les innovations ont les effets économiques les plus marquants n'a guère de sens. Imposer cette obligation à des propriétaires de brevets en situation de monopole porterait préjudice aux droits des inventeurs dont les innovations sont les plus précieuses puisque susceptibles de transformer un secteur et de balayer les anciennes technologies du marché du fait de leur supériorité technologique. Il est plus judicieux de favoriser la concurrence et l'innovation en définissant avec rigueur et justesse les droits de propriété octroyés par le système de brevet, en prenant des mesures pour veiller à ce que ces droits ne soient accordés qu'à de véritables innovations, puis en laissant les détenteurs de brevet faire valoir leurs droits à l'encontre des concurrents qui les enfreignent[71].

Shapiro conclut donc qu'il vaut mieux remédier aux problèmes du système de brevet en réformant celui-ci plutôt qu'en appelant à la rescousse les lois sur la concurrence. La Commission de la concurrence s'est déjà rangée à son avis sur ce point[72].

2.5 Autres modes de protection des investissements dans l'innovation

Nous avons constaté que les brevets n'ont pas autant d'adeptes dans certains secteurs novateurs que dans d'autres, et que des méthodes différentes sont utilisées plus fréquemment pour protéger l'investissement dans l'innovation. La présente section passe en revue quelques études empiriques qui jettent un certain éclairage sur ces questions[73]. Plusieurs mesures autres que le dépôt d'une demande de brevet peuvent être prises pour dissuader les imitateurs. Parmi ces options figurent le secret, l'arrivée en

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70 Voir par ex. Magill, C-241/91 P (E.C.J. 1995) ; In re Xerox Corp., 86 F.T.C. 364 (1975). Signalons que Xerox est un peu une anomalie aux États-Unis, les agences antimonopole ayant renoncé à l'obligation de concéder des licences dans le document commun DOJ/FTC Antitrust Guidelines for the Licensing of Intellectual Property 7 (1995).

71 Shapiro, supra note 4, 1025-26 (c'est l'original qui souligne).

72 Voir OCDE, DAF/COMP(2004)24, Intellectual Property, Executive Summary, p. 7 (Dans un climat où il est facile de breveter, par exemple, les agences de la concurrence et les tribunaux ont tendance à compenser en invoquant les lois sur la concurrence pour limiter l'incidence préjudiciable du brevetage excessif. Les lois sur la concurrence étant un outil grossier à cet égard, il serait préférable de trouver des remèdes dans le cadre du système de brevet plutôt qu'en dehors).

73 Dans certains secteurs, les investissements dans l'innovation peuvent être encouragés et protégés par des contrats, récompenses monétaires ou subventions des pouvoirs publics. Ces situations ne sont pas abordées ici. Le présent document traite des cas où l'entreprise est seule responsable de la protection des fruits de sa R-D contre les imitateurs et de leur rentabilisation. Pour des informations sur les programmes publics qui stimulent l'innovation grâce à des contrats, récompenses et subventions, voir Gallini et Scotchmer, supra note 12.

pionnier sur le marché, la complexité, les stratégies de verrouillage de la clientèle, et le renouvellement fréquent des produits.

Certaines sociétés ne cherchent pas à breveter leurs innovations parce qu'elles veulent éviter de les révéler à l'occasion d'un dépôt de brevet. L'entreprise peut estimer que lorsque ses concurrents en auront connaissance, ils pourront facilement trouver des moyens juridiques de contourner la protection accordée par le brevet et mettre eux-mêmes au point rapidement des technologies rivales. Si l'innovateur n'a pas à annoncer et à expliquer son innovation, ses concurrents peuvent très bien ne jamais en avoir connaissance ou, dans le cas contraire, mettre très longtemps à en déchiffrer le fonctionnement en l'absence de la documentation nécessaire à la demande de brevet. Il est sans doute plus facile de garder confidentiels les procédés nouveaux que les produits nouveaux, mais l'un et l'autre sont possibles.

Les avantages que tire une entreprise de son avance sur un nouveau marché (« avantage pionnier » ou « prime au premier entrant ») suffisent dans certains cas à très bien rentabiliser une invention, le dépôt de brevet devenant alors superflu. Un marché ayant une longue courbe d'apprentissage à pente douce, par exemple, permet ainsi au premier entrant de conserver des avantages de coûts substantiels sur ses rivaux qui arrivent plus tard sur le marché. Être pionnière sur un marché peut aussi donner à une entreprise une réputation privilégiée dont les concurrents ne peuvent jamais se prévaloir et grâce à laquelle ses clients sont disposés à payer un prix supérieur pour ses produits.

Lorsqu'une invention est particulièrement complexe, les concurrents risquent de ne pas pouvoir l'imiter, même s'ils en ont juridiquement le droit. Même s'ils découvrent les moyens de reproduire le produit ou procédé, le coût peut en être prohibitif et donc injustifié. Dans ce type de cas, la protection d'un brevet peut aussi se révéler inutile.

Les stratégies de verrouillage de la clientèle sont simples : elles obligent les clients à revenir au même fournisseur malgré l'existence de concurrents. Le renouvellement fréquent des produits, en revanche, ne constitue pas une contrainte mais incite les clients à revenir parce que l'entreprise met constamment sur le marché des versions nouvelles et améliorées de son produit.

Parfois ces diverses solutions coexistent. Une entreprise ayant mis au point un produit complexe peut bénéficier automatiquement d'une avance sur le marché pendant que ses rivaux s'efforcent de l'imiter. Ou bien l'entreprise peut se sentir bien protégée des imitations si son innovation nécessite un personnel spécialement formé utilisant des équipements qui lui sont propres. Dans l'un et l'autre cas, les entreprises innovantes ont probablement l'intention de mettre au point d'autres applications ou perfectionnements avant que leurs concurrents n'aient réussi à rattraper la première.

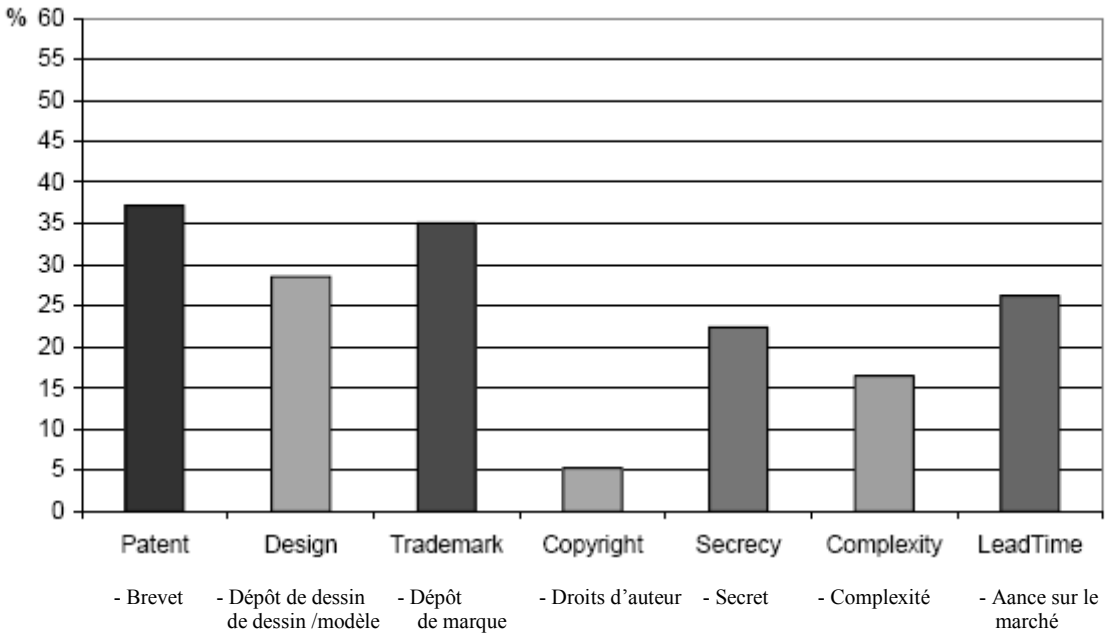
Pour en revenir aux études empiriques, il est bon de commencer par Mairesse et Mohnen, qui ont récemment comparé en France l'utilisation des brevets avec d'autres moyens de protection et d'appropriation de la valeur des innovations dans les secteurs secondaire et tertiaire[74]. En utilisant les informations de la troisième Enquête communautaire sur l'innovation (CIS3), couvrant les années 1998-2000, les auteurs ont d'abord classé les données en trois catégories : secteurs manufacturiers de haute technologie, secteurs manufacturiers de basse technologie et secteur tertiaire[75]. En s'attachant uniquement

74 Jacques Mairesse et Pierre Mohnen, "Intellectual Property in Services: What Do We Learn from Innovation Surveys?" in OCDE, Patents, Innovation and Economic Performance, Conference Proceedings (2004).

75 Les secteurs manufacturiers de haute et basse technologie ont été définis en fonction de leur intensité de R-D. Id., 230 n.4.

aux entreprises qui se considèrent comme innovantes[76], on perçoit clairement les différences entre les trois catégories, non seulement en ce qui concerne leur dépendance à l'égard des brevets, mais aussi leur recours au secret et à l'avance sur le marché (voir graphiques 2 à 4.)

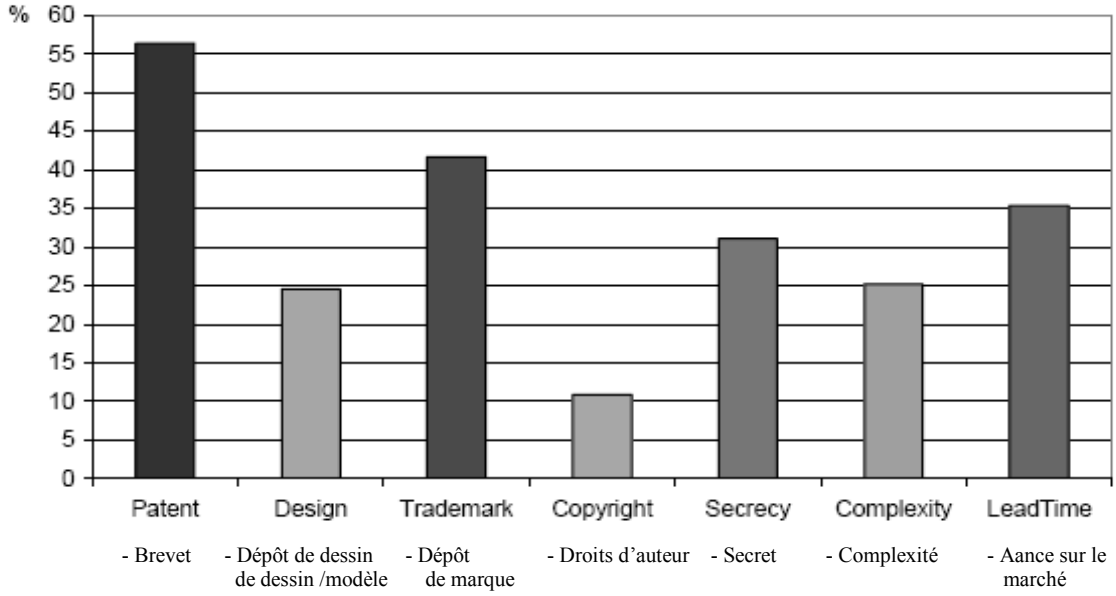
Graphique 2. Fabrication de haute technologie



Source : Mairesse et Mohnen, supra note 74, 239.

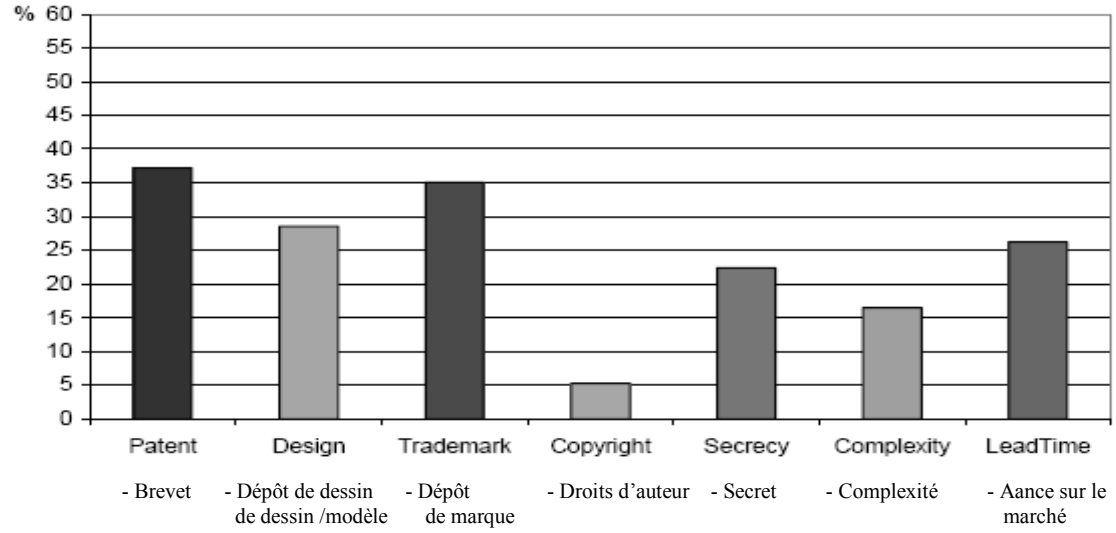
76 Les entreprises innovantes ont déclaré qu'elles avaient présenté un produit nouveau ou nettement amélioré, mis en œuvre un procédé nouveau ou nettement amélioré, ou ont déclaré des activités d'innovation en cours ou abandonnées. Id., 230.

Graphique 3. Fabrication de basse technologie



Source : Mairesse et Mohnen, supra note 74, 239.

Graphique 4. Secteur tertiaire



Source : Mairesse et Mohnen, supra note 74, 240.

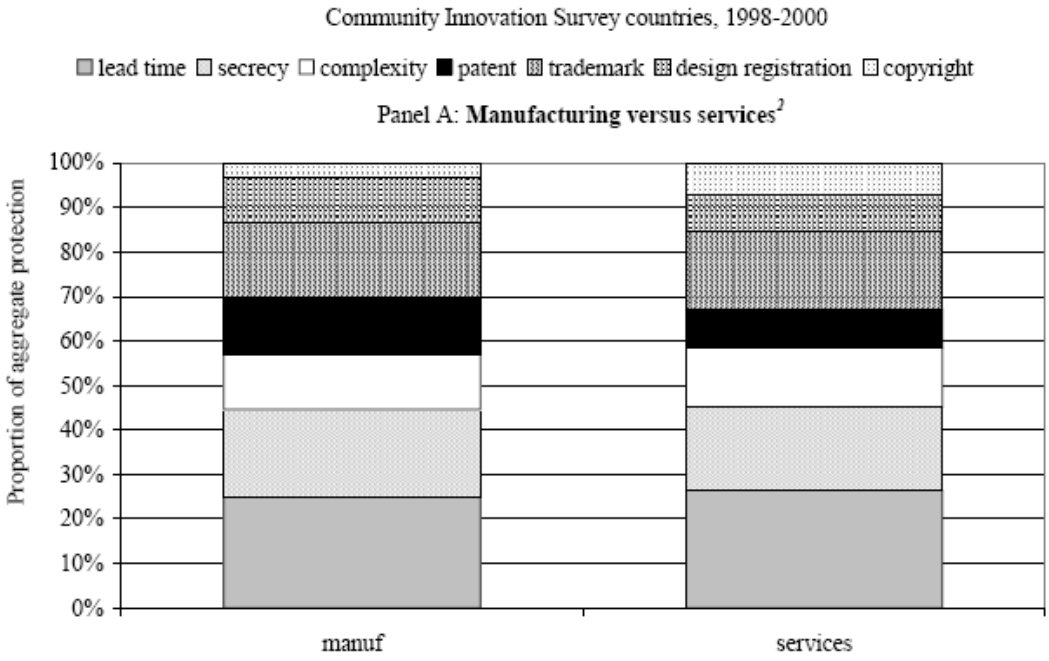
Les brevets sont la protection la plus prisée dans les secteurs manufacturiers, mais non dans le secteur tertiaire, où les entreprises comptent davantage sur le dépôt de marque, l'avance sur le marché et la complexité de l'invention. Même dans les secteurs de fabrication, l'avance sur le marché est utilisée par plus de 25% des entreprises. Il est donc probable que les avantages qu'obtient le premier entrant sont souvent substantiels. Le secret et la complexité sont très fréquents dans les secteurs manufacturiers de haute technologie mais seules les entreprises du secteur tertiaire les emploient autant ou plus que les brevets.

Les données émanant d'un groupe plus large de pays de l'enquête CIS3 permettent de constater une dépendance moins forte à l'égard des brevets que ne l'ont constatée en France Mairesse et Mohnen par rapport aux autres mesures de protection (graphique 5). Dans les secteurs manufacturiers comme dans le secteur tertiaire, le recours à la protection des brevets est relativement faible si on la compare à l'avance sur le marché, au secret et au dépôt de marque. Signalons que les pourcentages du graphique 5 ne sont pas quantitativement comparables à ceux des graphiques 2 à 4. Ils sont toutefois ordinalement comparables[77]. Autrement dit, on constate clairement que les brevets ne sont pas la méthode privilégiée dans le graphique 5, alors qu'ils arrivent en premier dans les graphiques 2 et 3. En revanche, il n'est pas possible de comparer les chiffres mêmes du graphique 5 à ceux des graphiques 2 à 4.

Graphique 5. Choix de la méthode de protection [1]

Pays de l'Enquête communautaire sur l'innovation, 1998-2000

Section A : Comparaison des secteurs secondaire et tertiaire [2]



1) Le pourcentage de chaque type de protection par rapport à l'ensemble est le rapport entre le nombre d'entreprises utilisant ce mode particulier et le total des pourcentages des entreprises utilisant les divers modes de protection. Les entreprises peuvent recourir à plusieurs modes de protection.
2) Les totaux sectoriels sont calculés à partir d'une moyenne pondérée des données des divers pays pour le secteur en utilisant comme indice de pondération la part du pays dans l'ensemble des entreprises de ce secteur dans tous les pays étudiés.

Source : Jaumotte et Pain, supra note 2, 26.

77 En dehors du fait que les chiffres des graphiques 2 à 4 s'appuient sur des données relatives à la France et ceux du graphique 5 sur un groupe plus large de pays, la hauteur des barres du graphique 5 est celle qu'on obtiendrait en divisant, une par une, la hauteur de chaque barre du graphique 2 (ou 3 ou 4) par la hauteur totale de l'ensemble des barres du même graphique.

L'étude de Cohen, Nelson et Walsh[78] sur les entreprises manufacturières des États-Unis, déjà évoquée, témoigne d'une moindre dépendance relative à l'égard des brevets que ne font apparaître les données de Mairesse et Mohnen pour les entreprises françaises. Ces trois auteurs ont découvert que les brevets sont parmi plusieurs possibilités le type de protection le moins apprécié des entreprises étudiées, qui leur préfèrent le secret et l'avance sur le marché. En fait, le recours au secret a augmenté spectaculairement du début des années 80 à 1994[79].

On peut généralement conclure des études empiriques qu'il existe un rapport complexe entre le système de protection de la propriété intellectuelle, le brevetage et l'activité innovante.

3. Concurrence et innovation

Comme pour les brevets et l'innovation, les théoriciens mènent depuis maintes années un dialogue sur la relation entre concurrence et innovation. Le débat, lancé au début des années 40 par Joseph Schumpeter[80], a généré deux optiques très différentes quant à l'incidence de la concurrence sur l'innovation. D'après le point de vue dit « schumpétérien », les grandes entreprises dominantes sont plus susceptibles d'innover que les sociétés de moindre envergure parce que ces dernières n'ont pas assez de pouvoir sur le marché ; en revanche, les innovations sont aussi des « tempêtes de destruction créatrice », qui rendent éphémère ce pouvoir dans les secteurs de haute technologie. L'autre optique est que la concurrence stimule l'innovation parce qu'une entreprise puissante, bien ancrée sur le marché, est moins portée à investir dans le développement de nouvelles technologies, alors que les entreprises confrontées à une concurrence plus vive ont davantage à gagner en innovant.

Les agences de la concurrence penchent généralement pour la deuxième optique. Bon nombre d'opinions hostiles formulées dans les dossiers relatifs aux fusions prédisent qu'une fusion jugée nuisible à la concurrence sur le marché des produits est également susceptible de freiner l'innovation[81]. L'une des questions essentielles de la présente table ronde est de savoir si on peut considérer comme fondée l'hypothèse selon laquelle la concurrence est plus favorable à l'innovation que les situations de monopole.

La section 3.1 explique qu'il y a une certaine équivoque dans la théorie économique à propos de la relation entre concurrence et innovation. Lorsqu'il est difficile pour les entreprises de s'approprier la valeur de leurs innovations, la théorie prédit que la concurrence réduit les incitations à innover. Ceci donne à penser que, dans certains cas, permettre une fusion (ou un autre type de comportement) préjudiciable à la concurrence va accroître l'incitation à innover. D'un autre côté, la théorie indique aussi que l'intensification de la concurrence stimule l'innovation dans bon nombre de situations.

Malheureusement, les données du monde réel ne permettent pas de résoudre cette contradiction théorique car les études empiriques parviennent elles aussi à des résultats contrastés. Suivant les

78 Cohen, et al., supra note 23.

79 Id., 3.

80 Joseph Schumpeter, Capitalism, Socialism and Democracy (1942).

81 Par exemple, les agences antitrust des États-Unis citent les incidences sur l'innovation comme raison de contester plus d'une sur trois des fusions auxquelles elles ont tenté de s'opposer entre 2000 et 2003. Richard Gilbert, "Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?" in Adam Jaffe, Josh Lerner et Scott Stern (éd.), vol. 6 Innovation Policy and the Economy, NBER, 3 (à paraître).

circonstances et les hypothèses dont elles partent, certaines montrent que la concurrence encourage l'innovation, d'autres qu'elle la freine[82].

3.1 Considérations théoriques

L'intensité de la concurrence sur le marché d'un produit a une incidence sur les activités innovantes. De quelle façon ? Il n'y a pas de réponse simple à cette question épineuse, car toute réponse doit s'assortir de multiples conditions, exceptions et réserves. Une chose, au moins, paraît assurée : la concurrence est susceptible aussi bien de favoriser que de décourager l'innovation. D'un côté, une vive concurrence peut inciter les entreprises à innover afin de se maintenir au niveau de leurs concurrents, de les dépasser ou de conserver leur avance. Mais de l'autre, l'existence d'un certain pouvoir sur le marché peut stimuler l'innovation en facilitant la récupération des coûts et la réalisation d'un bénéfice. Les décideurs ont donc la tâche peu enviable de créer un climat dans lequel la rémunération de l'innovation suffit à la stimuler, mais où il existe des pressions concurrentielles qui encouragent les entreprises à créer, valoriser et diffuser des innovations. Trouver le bon équilibre est d'autant plus délicat que les processus d'innovation et l'importance des brevets (et autres DPI) dans l'incitation à l'invention varient considérablement suivant les secteurs et les types d'invention. La section 3.2 étudie de plus près ces variations du monde réel. Il est utile de voir au préalable ce qu'ont dit les théoriciens sur la concurrence et l'innovation[83].

3.1.1 Innovations de procédé

La théorie économique n'a pas produit de modèle unique et universel expliquant pour toutes les situations l'effet de la concurrence sur l'innovation. Il existe en réalité toute une série de modèles spécialisés, dont le plus ancien est celui d'Arrow, qui part de l'hypothèse d'une protection exclusive complète et permanente de la PI pour les inventeurs et ne traite que des innovations de procédé. Arrow démontre qu'un monopole pur opérant dans un tel environnement est moins motivé pour investir dans l'invention de procédé que ne le seraient des entreprises opérant dans un marché concurrentiel. En effet, le monopole bénéficie déjà d'un flux de profits de niveau supra concurrentiel qui se maintiendra même s'il n'innove pas. Il est vrai qu'il pourrait accroître ses bénéfices en innovant, mais seulement d'un montant marginal. En revanche, une société opérant sur un marché concurrentiel ne bénéficie pas d'un tel avantage et la même innovation lui permet de réaliser un profit différentiel plus important. Arrow conclut que dans ces conditions, les schumpétériens ont tort car la concurrence est plus propice à l'innovation que la situation de monopole[84].

En partant d'une situation à mi-chemin entre le monopole et le marché concurrentiel, à savoir un marché marqué par une entreprise dominante et un grand nombre de concurrentes plus modestes, Arrow parvient à des résultats variables selon que l'innovation est drastique ou non. Une innovation drastique réduit tellement le coût marginal de production que même si l'inventeur exige un prix de monopole, ce prix reste inférieur au coût marginal de toute entreprise exploitant le procédé ancien et moins rentable. Aucune entreprise ne pouvant alors proposer un prix plus faible, l'inventeur d'une innovation drastique engrange dans ce cas des profits de monopole, qu'il s'agisse de l'entreprise dominante ou d'une entreprise plus petite. Cependant, le différentiel obtenu par la société dominante serait marginal, alors qu'une entreprise

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82 Il faut à propos de ces études signaler un point important : la plupart ne peuvent qu'établir si une corrélation existe ou non. Ce n'est pas la même chose que de prouver ou de réfuter que la concurrence cause une augmentation ou une diminution de l'innovation.

83 La discussion qui suit est en grande partie tirée de Gilbert, supra note 81.

84 Kenneth Arrow, "Economic Welfare and the Allocation of Resources to Invention," in Richard Nelson (éd.), The Rate and Direction of Economic Activity (1962).

plus modeste réaliserait soudain des bénéfices de monopole et serait donc davantage incitée à innover. La conclusion d'Arrow reste ainsi intacte.

En revanche, pour une innovation non drastique, le bénéfice qu'en tire une petite entreprise est limité par la concurrence qu'exerce l'ancienne technologie de l'entreprise dominante. Autrement dit, le prix de monopole basé sur le nouveau coût marginal de l'innovateur est supérieur au prix basé sur le coût marginal de l'entreprise dominante. Un monopole pur, quant à lui, ne serait cependant pas confronté à ce type de concurrence contraignante. Ceci veut-il dire que dans ces conditions, le point de vue schumpétérien est valide ? Contre toute attente, la réponse est négative, là aussi parce que le monopole gagnerait déjà des bénéfices d'un niveau supra concurrentiel, même avec l'ancien procédé plus onéreux. Arrow démontre qu'après avoir déduit ces bénéfices, le rapport net de l'innovation pour le monopole est plus faible que pour une entreprise plus modeste et opérant dans un marché concurrentiel, même si l'innovation de procédé n'est pas drastique (mais seulement si les bénéfices de l'entreprise plus modeste n'étaient pas déjà de niveau supra concurrentiel avec l'ancien procédé).

3.1.2 Innovations de produit

L'analyse se complique tant soit peu lorsqu'on aborde l'innovation de produit. Étant donné la différenciation des produits, même les entreprises des marchés concurrentiels qui sont essentiellement des preneurs de prix peuvent encore gagner un certain bénéfice d'un niveau supra concurrentiel Elles ne bénéficient donc que marginalement d'une innovation de produit, ce qui n'est pour elles guère incitatif. Néanmoins, cet effet n'est probablement pas aussi prononcé que pour un pur monopole qui aurait vraisemblablement gagné des bénéfices encore plus élevés avant l'innovation. On peut s'attendre logiquement à ce que les entreprises en concurrence soient ici encore plus motivées pour innover que les monopoles. S'agissant de l'innovation de produit, il faut toutefois prendre en compte un nouvel élément : un monopole pourrait gagner davantage avec ce nouveau produit qu'un rival plus modeste si celui-ci était contraint de vendre son nouveau produit en concurrence avec un acteur dominant. Le monopole pourrait aussi pratiquer une discrimination de prix plus efficace que l'entreprise non dominante, ce qui lui permettrait aussi d'augmenter ses profits. Il est donc impossible de conclure généralement que les monopoles sont moins motivés pour innover que les non monopoles. Il n'y a donc pas, en d'autres termes, de verdict clair et net sur l'hypothèse de Schumpeter.

Cependant, si nous partons de l'hypothèse que le produit innovant condamne l'ancien à l'obsolescence, le bénéfice brut que tire l'entreprise en concurrence de l'innovation n'est pas inférieur à celui du monopole. L'effet de bénéfice marginal est moindre pour une entreprise en concurrence que pour un monopole (puisque la première a moins à perdre de la cannibalisation) et elle engrangerait donc un bénéfice net supérieur pour une innovation de produit drastique. Dans ce cas, les schumpétériens sont de nouveau mis à mal.

3.1.3 La R-D simultanée

Le modèle d'Arrow part du principe qu'une seule entreprise à la fois peut innover. En fait, dans le monde réel, plusieurs entreprises peuvent investir dans l'innovation simultanément. Pour tenir compte de cette possibilité, Gilbert et Newbery ont mis au point un modèle dans lequel un monopole et un entrant investissent parallèlement dans la R-D dans le but de breveter une nouvelle technologie[85]. Le modèle suppose que le plus gros investisseur obtient le brevet, qui est considéré comme conférant à l'invention une protection complète et permanente contre la concurrence.

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85 Richard Gilbert et David Newbery, "Preemptive Patenting and the Persistence of Monopoly," 72 American Economic Review 514 (1982).

Si l'entrant obtient le brevet et que l'innovation ne soit pas drastique, il est en concurrence avec le monopole. Si l'entrant n'obtient pas le brevet, son profit se limite au montant qu'il peut obtenir avec l'ancienne technologie et risque même d'être nul. L'entrant obtenant le brevet y gagne au maximum l'écart entre le bénéfice qu'il tire de la nouvelle technologie et celui qu'il obtiendrait sans elle. En revanche, si le monopole obtient le brevet, il conserve sa situation de monopole et gagne un bénéfice de monopole. S'il n'obtient pas le brevet, le monopole devient un duopole utilisant l'ancienne technologie et obtient un bénéfice de duopole (là aussi si l'innovation n'est pas drastique). Dans ces conditions, c'est le monopole qui peut tirer du brevet un bénéfice plus important que l'entrant : s'il l'obtient, il conserve sa situation de monopole et s'il ne l'obtient pas, le risque le plus grave est pour lui de devenir un duopole. En conséquence, le monopole a davantage intérêt à investir dans la demande de brevet que ne peut se le permettre l'entrant, jusqu'à un montant égal à la valeur courante du flux de bénéfice de monopole qu'il pourrait conserver en éliminant la concurrence de cette manière. Par contre, l'entrant n'est pas en mesure de réaliser un profit de monopole, même s'il obtient le brevet, pour une innovation non drastique. Gilbert et Newbery ont ainsi trouvé un moyen d'appuyer la perspective de Schumpeter pour des raisons théoriques.

Lorsque l'innovation est drastique, la situation est heureusement plus simple. L'entrant peut alors réaliser grâce à la nouvelle technologie autant de bénéfices que le monopole, les deux entreprises ayant ainsi le même intérêt à obtenir le brevet. Ce scénario n'est manifestement pas conforme à la position de Schumpeter.

La situation se complique de nouveau si nous éliminons l'hypothèse selon laquelle toutes les entreprises ont la même structure de coûts préalablement à l'innovation. L'analyse se rapproche alors davantage de la réalité mais permet encore moins de parvenir à des conclusions catégoriques sur le plan de la théorie. Si les entreprises ont des coûts marginaux différents, on aimerait savoir si ce sont les entreprises plus faibles qui sont incitées à innover (afin de rattraper ou de dépasser leurs concurrentes) ou si ce sont au contraire les rivales plus efficaces (souhaitant distancer plus encore leurs concurrentes). Il y a quelques années, Boone a montré que la réponse est fonction de l'intensité de la concurrence[86]. Si la concurrence est âpre, c'est l'entreprise la plus efficace qui va investir le plus dans la R-D pour une nouvelle technologie de procédé, mais si la concurrence est faible, c'est la moins efficace qui est la plus motivée. Il en ressort que les activités de R-D visant les nouvelles technologies de procédé ont tendance à maintenir la position des entreprises dominantes dans les secteurs intensément concurrentiels, alors qu'elles permettent aux sociétés en perte de vitesse de gagner du terrain sur leurs rivales dans les secteurs où la concurrence est moins vive.

Le fait que le niveau de concurrence lui-même est probablement déterminé de façon endogène a en fait une incidence sur les conclusions de Boone. Les entreprises sont plus portées à se concurrencer vigoureusement lorsque leurs coûts et les caractéristiques de leurs produits sont analogues. C'est pourquoi la R-D qui transforme ces coûts et caractéristiques modifie aussi les incitations à la concurrence, qui elles-mêmes se répercutent sur la motivation de l'entreprise à maintenir une position dominante ou à rattraper une rivale plus puissante. En d'autres termes, la concurrence et l'innovation sont interdépendantes, et continuent de s'adapter l'une à l'autre en une boucle de réaction continue. Ceci signifie qu'elles ne sont pas statiques suffisamment longtemps pour qu'on puisse parvenir à des conclusions fermes sur les relations qu'elles entretiennent.

D'autres modèles tiennent compte de l'incidence possible du volume total des investissements en R-D réalisés par une entreprise tout au long de son existence sur la probabilité de succès d'une activité

[86] Jan Boone, "Intensity of Competition and the Incentive to Innovate," 19 International Journal of Industrial Organization 705 (2000).

innovante particulière[87]. Plus elle a acquis de savoir-faire dans le passé, plus elle a de chances que cette invention soit profitable. Ces modèles parviennent à des résultats variables. D'aucuns suggèrent que les marchés concurrentiels sont plus favorables à l'innovation, d'autres l'inverse. En bref, lorsque l'expérience passée de la recherche est très importante pour une innovation donnée et qu'il n'existe pas d'incertitude excessive dans le processus de découverte, une entreprise dominante qui se situe déjà en tête de la course à l'innovation peut conserver son avance et s'assurer du succès. Ses concurrentes, qui ne l'ignorent pas, peuvent décider d'abandonner la lutte à cet égard. Éliminer les rivaux est plus difficile lorsqu'il existe dans le processus d'invention une incertitude. Une entreprise à la traîne peut alors parfois mettre tout en œuvre pour rattraper l'entreprise dominante. Dans ce cas, la concurrence en R-D peut générer davantage d'innovation que la situation de monopole.

Les théories évoquées jusqu'ici semblent, entre autres, vouloir établir des conclusions très tranchées sur la corrélation entre concurrence et innovation. Autrement dit, elles concluent que le monopole absolu ou que la concurrence absolue stimule mieux l'innovation. On pourrait cependant croire, intuitivement, que la structure de marché la plus propice est celle où il existe une concurrence modérée. Dans un marché vivement concurrentiel, une petite entreprise peut avoir une échelle d'exploitation trop modeste pour espérer tirer de la mise au point d'une nouvelle technologie un bénéfice suffisant pour motiver un investissement. Un grand monopole, en revanche, risque d'être dissuadé, comme le dit Arrow, par l'effet créé par son flux de bénéfice existant. Dans la mesure où la concentration du marché nous renseigne sur l'intensité de la concurrence, ces considérations suggèrent que des niveaux intermédiaires de concentration sont peut-être les plus favorables à l'activité innovante. La section suivante analyse cette idée de façon plus approfondie.

3.2 Études empiriques

On peut dire sans exagération qu'il existe une myriade d'études économétriques portant d'une manière ou d'une autre sur les corrélations entre concurrence et innovation. Il existe en effet davantage d'études sur la relation entre la structure du marché et l'intensité de R-D que sur tout autre sujet dans le domaine de l'organisation industrielle[88].

La concurrence et l'innovation étant difficiles à mesurer directement, ces études recourent presque toujours à des variables indicatives, telles que les taux de concentration ou la part de marché en ce qui concerne la concurrence et l'intensité de R-D ou le nombre de brevets accordés s'agissant de l'innovation. Ces valeurs indicatives sont imparfaites puisque l'on comprend bien désormais que la structure de marché et le niveau de concurrence sur le marché ne sont pas nécessairement en étroite corrélation. Qui plus est, l'intensité de R-D et les brevets ne sont pas des indicateurs parfaitement fiables de l'innovation, comme on l'a mentionné plus haut. Néanmoins, les économistes semblent être mieux en mesure d'affiner leurs modèles afin d'en atténuer au maximum les distorsions et pour que les valeurs indicatives soient le plus fiable possible.

Si l'on peut extraire de toutes ces études un élément de réflexion commun, ce serait probablement l'idée qu'il existe une relation en U inversé entre la concentration du marché et l'intensité de R-D lorsque l'on représente graphiquement la première en abscisse et la deuxième en ordonnée. En d'autres termes, on estime généralement que la concentration et l'intensité de R-D sont en corrélation positive lorsque la

87 Par exemple, Drew Fudenberg, Richard Gilbert, Joseph Stiglitz et Jean Tirole, "Preemption, Leapfrogging and Competition in Patent Races," 22 European Economic Review 3 (1983); Chris Harris et John Vickers, "Perfect Equilibrium in a Model of a Race, 52 Review of Economic Studies 193 (1985); Ulrich Doraszelski, "An R&D Race with Knowledge Accumulation," 34 Rand Journal of Economics 20 (2003).

88 Wesley Cohen et Richard Levin, "Empirical Studies of Innovation and Market Structure," in Richard Schmalensee et Robert Willig (éd.), 2 Handbook of Industrial Organization 1060 (1989).

concentration est faible, puis que l'activité de R-D culmine à un niveau modéré de concentration, et enfin que la corrélation devient négative et l'intensité de R-D diminue à mesure que la concentration continue d'augmenter. Ici aussi – et dans la mesure où la concentration du marché est une bonne indication du degré de concurrence – on peut penser que le climat le plus propice à l'innovation est un marché à concurrence modérée.

Une première approche de Scherer, basée sur la théorie des jeux, prédisait qu'une rivalité plus âpre, représentée par des indices de concentration plus faibles, stimule jusqu'à un certain point les dépenses de R-D, mais qu'une concentration trop faible serait au contraire défavorable, car il devient alors trop difficile pour les entreprises de tirer une rente suffisante du produit de leurs innovations[89]. Dans les années 80, les modèles s'appuyant sur la théorie des décisions confirmaient l'optique de Scherer, c'est-à-dire le fait que les structures de marché intermédiaires présentent souvent l'activité innovante la plus intense[90]. Les modèles théoriques plus récents continuent de prédire que c'est à une courbe en U inversé que correspond le mieux la relation entre la concurrence sur le marché des produits et l'innovation[91].

Il convient néanmoins de souligner que cette représentation en U inversé est une conclusion d'ensemble. Les résultats varient en effet – entre autres – d'une branche d'activité à une autre et certaines études parviennent à des conclusions ambiguës ou antinomiques. Comme l'ont signalé Scherer et d'autres, la théorie de l'U inversé ne tient pas toujours très bien lorsque l'on prend en compte d'autres facteurs de l'innovation (comme les possibilités technologiques existant dans un secteur donné)[92]. Levin, Cohen et Mowery, par exemple, avaient observé au départ une relation en U inversé statistiquement significative entre d'une part la concentration du marché et d'autre part l'intensité de R-D et la cadence des innovations. Cette corrélation culmine à un indice C4[93] de 50 à 60%, ce qui correspond aux résultats obtenus par Scherer dans son étude de 1967[94]. Mais les auteurs ont ensuite pris en compte les possibilités technologiques et la capacité d'extraire des profits en ajoutant de nouvelles variables représentant des facteurs tels que le secret, l'avance sur le marché, et la facilité de l'imitation. Le poids des variables de concentration diminue alors sensiblement dans l'analyse de régression, alors que les possibilités technologiques et l'appropriabilité des profits se révèlent significatifs. La relation susceptible d'exister entre la concentration et la R-D dans l'ensemble d'une économie, quelle qu'elle soit, ne tenait donc apparemment pas face aux différences intersectorielles en matière de possibilités technologiques, de demande et d'appropriabilité. La taille de l'entreprise et son pouvoir sur le marché ne semblaient plus compter beaucoup[95].

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89 F.M. Scherer, "Market Structure and Employment of Scientists and Engineers," 57 American Economic Review 524 (1967).

90 Morton Kamien et Nancy Schwartz, Market Structure and Innovation 105-145 (1982).

91 Phillipe Aghion, Nicholas Bloom, Richard Blundell, Rachel Griffith et Peter Howitt, "Competition and Innovation: An Inverted U Relationship," NBER Working Paper #9269 (2002).

92 F.M. Scherer et David Ross, Industrial Market Structure and Economic Performance 646 (3e éd. 1990); George Symeonides, "Innovation, Firm Size and Market Structure: Schumpeterian Hypotheses and Some New Themes," London School of Economics, Economics Department Working Paper N° 161 par. 44 (1996).

93 L'indice C4 est la part de marché combinée des quatre entreprises principales d'une branche d'activité donnée.

94 Scherer, supra note 89.

95 Richard Levin, Wesley Cohen et David Mowery, "R&D Appropriability, Opportunity and Market Structure: New Evidence on Some Schumpeterian Hypotheses," 57 American Economic Review Proceedings 20 (1985).

Néanmoins, les travaux actuels en reviennent au modèle de l'U inversé, même en présence d'autres facteurs de l'innovation. Dans leur étude empirique des *chaebols* coréens[96], Mahmood et Lee, par exemple, se demandent de quelle façon leurs parts de marché sont liées à l'innovation. En introduisant des variables représentant les possibilités technologiques et la part de R-D dans chaque secteur étudié, ces auteurs concluent que l'innovation culmine lorsque les parts des chaebols dans le secteur sont d'environ 65%. Il est intéressant de noter ici que les chaebols comptent pour environ 70% des ventes dans les secteurs coréens de l'électronique et des véhicules automobiles[97].

Que peut donc être la cause de cette relation en U inversé entre la concentration et l'innovation? Pour Mahmood et Lee, il peut s'agir des barrières à l'entrée, qui sont susceptibles d'encourager l'innovation jusqu'à un certain seuil, puis de produire l'effet inverse. Plus précisément, il est possible que dans un marché où ces barrières sont basses, leur relèvement atténuerait le risque de l'investissement R-D en stabilisant le comportement des rivaux, donc en le rendant plus prévisible et en les empêchant d'imiter trop rapidement l'invention. Ceci stimulerait à son tour l'innovation. Au-delà d'un certain seuil, les barrières à l'entrée risquent toutefois de nuire à l'innovation en facilitant la collusion entre les entreprises ainsi protégées ou en leur donnant le sentiment que leur position sur le marché est inattaquable et qu'il n'est donc guère nécessaire d'innover. Une forte corrélation entre le niveau des barrières à l'entrée et la concentration du marché expliquerait comment ces barrières peuvent être la cause de la courbe en U inversé que présente la relation entre la concentration du marché et l'intensité de R-D[98].

Une autre étude récente part de l'idée qu'il serait possible de mesurer précisément l'incidence de la concurrence sur l'innovation si un facteur extérieur inattendu venait à modifier le niveau de concurrence sur un marché donné, à la condition que les autres facteurs, telles les possibilités technologiques et l'appropriabilité des bénéfices de l'invention, restent inchangés. S'inspirant de cette idée, Carlin, Schaffer et Seabright se sont penchés sur les performances enregistrées au niveau de l'entreprise après la privatisation d'entreprises publiques dans 24 pays en transition. Ils concluent qu'il doit exister un minimum de rivalité pour stimuler l'innovation. Les entreprises opérant sur des marchés exposés à la concurrence étrangère ont innové davantage après leur privatisation. De surcroît, d'après les observations, la performance innovante bénéficie davantage de l'existence de quelques rivaux que d'un marché où les concurrents sont nombreux ; ceci vient de nouveau confirmer la relation en U inversé entre innovation et concurrence[99].

On peut aussi pour évaluer cette relation, étudier la mesure dans laquelle la concurrence est freinée par la réglementation, puis la comparer à l'intensité de R-D dans diverses économies. Il est utile pour la recherche que les pays de l'OCDE mènent des politiques différentes à cet égard, puisque ceci permet de tirer des conclusions, préliminaires, en ce qui concerne l'effet de ces réglementations sur l'innovation.

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96 Un chaebol est un groupement de nombreuses entreprises autour d'une société mère, avec généralement détention réciproque d'actions. C'est un concept analogue au keiretsu japonais.

97 Ishtiaq Mahmood et Chang-yang Lee, "Business Groups: Entry Barrier-Innovation Debate Revisited," 54 Journal of Economic Behavior and Organizations 513 (2004).

98 Id., 514.

99 Wendy Carlin, Mark Schaffer, et Paul Seabright, "A Minimum of Rivalry: Evidence from Transition Economies on the Importance of Competition for Innovation and Growth," 3 Contributions to Economic Analysis & Policy, Article 17 (2004). Comme l'indique Gilbert, il convient d'avoir en tête certains faits en lisant cette étude et savoir notamment que bien des entreprises étudiées étaient très modestes et que certaines étaient des sociétés nouvelles créées après la privatisation. Voir Gilbert, supra note 81, 44-45.

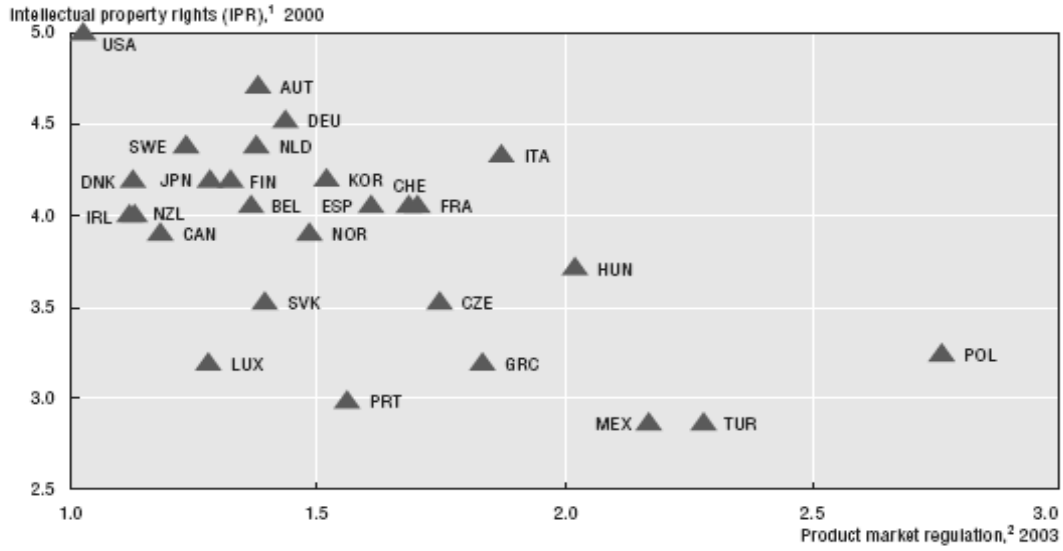
Considérés ensemble, les graphiques 6 et 7 fournissent quelques indices quant à l'effet de la concurrence sur l'innovation[100]. Au graphique 6, nous prenons en compte, aux fins de la présente analyse, uniquement les positions des divers pays sur l'abscisse, qui représente les contraintes exercées par la réglementation sur la concurrence. Signalons notamment les positions des États-Unis, du Danemark, de la Suède, du Japon et de la Finlande sur cet axe. Ce sont les pays les moins réglementateurs à cet égard. Voyons maintenant où se situent ces mêmes pays au graphique 7. D'après les barres dénommées « structure industrielle du G7 », chacun de ces cinq pays figure parmi les six premiers en matière d'intensité de R-D[101]. Qui plus est, parmi les pays qui apparaissent dans les deux graphiques, les deux régimes les plus restrictifs au moment du recueil des données (ceux de la Pologne et de l'Italie) se situent dans les quatre derniers en matière d'intensité de R-D[102]. Cet exercice est très schématique et il n'a pas été entrepris par ceux qui ont créé ces représentations graphiques. Il ne prouve en rien qu'il existe une relation de cause à effet mais suggère qu'une telle relation est possible. En d'autres termes, ces graphiques ne semblent pas réfuter l'idée qu'une réglementation pesant moins sur la concurrence est propice à l'innovation (et de ce fait à la croissance économique et à l'intérêt du consommateur).

100 L'indicateur de la réglementation du marché des produits utilisé au graphique 6 a été mis au point à l'OCDE et couvre le contrôle de l'État sur le fonctionnement des entreprises, les obstacles à l'entreprenariat, aux échanges extérieurs et à l'investissement direct étranger. Pour plus de renseignements, voir OCDE, supra note 1, 67 n.15.

101 Il est important d'observer ces barres, plutôt que celles de la structure spécifique à chaque pays : ces dernières en effet ne tiennent pas compte du fait que certains pays ont des structures industrielles plus intensives en R-D que d'autres, ce qui fausserait les résultats. Les secteurs pharmaceutique et informatique, par exemple, présentent les intensités de R-D les plus fortes dans tous les pays de l'OCDE. Mais ces secteurs sont plus présents dans certaines économies que dans d'autres, ce qui fausse les résultats. C'est pourquoi la structure industrielle du G7 est incluse pour chaque pays : elle permet d'éliminer l'incidence des particularismes en recalculant l'intensité de R-D globale du secteur marchand pour chacun d'eux (on suppose que les pays présentent la même structure industrielle, égale à la moyenne du G7). Id., 57.

102 Si l'on recalcule ces données dans plusieurs années, il est vraisemblable que l'Italie remontera dans la classification car elle vient d'adopter une loi apportant des modifications favorables à la concurrence. Voir la loi du 4 août 2006, n. 248, « Dispositions urgentes concernant le développement économique et social, la maîtrise et la rationalisation des dépenses publiques, les interventions dans les domaines des revenus publics et de la répression de l'évasion fiscale ». Pour plus de détails, consulter le document de l'OCDE, Recent Liberalization Drive in Italy, DAF/COMP/WP2/WD(2006)66.

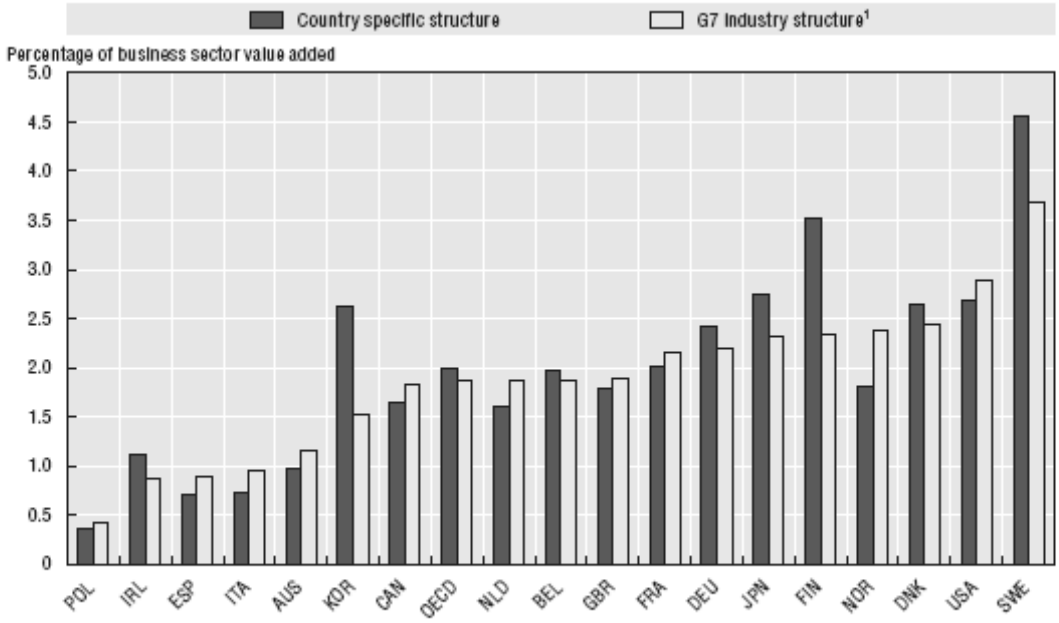
Graphique 6. Réglementations des marchés de produits restreignant la concurrence et droits de propriété intellectuelle



1. Index scale of 0-5 from least to most restrictive.
2. Index scale of 0-6 from least to most restrictive.

Source : OCDE, Réformes économiques : Objectif croissance 68 (2006).

Graphique 7. Intensité de la R-D du secteur marchand corrigée des variations de structure industrielle Moyenne sur la période 1999-2002



1. All countries are assumed to have the same industry structure. Calculated on the basis of R&D intensity per industry with the weights of each industry corresponding to their share of total business-sector value added on average across G7 countries.

1. En posant l'hypothèse que tous les pays ont la même structure industrielle. Calculée sur la base de l'intensité de la R-D par branche d'activité, le poids de chaque branche correspondant à la part de celle-ci dans la valeur ajoutée de l'ensemble du secteur marchand ramenée à la moyenne des pays du G7.

Source : OCDE, Réformes économiques : Objectifs croissance 59 (2006).

Heureusement, deux économistes de l'OCDE ont étudié cette question avec plus de rigueur en 2005[103]. Ils ont utilisé des régressions des données de panel pour étudier l'incidence des politiques d'innovation et autres facteurs économiques d'ordre général sur l'intensité de R-D des entreprises et leurs dépôts de brevets pour un échantillon de 20 pays de l'OCDE au cours de la période 1982-2001. D'après leurs résultats, et toutes choses égales par ailleurs, les réglementations anticoncurrentielles (autres que les DPI) présentent une corrélation négative importante avec l'intensité de R-D comme avec le nombre de brevets. Les auteurs observent en fait que la souplesse des réglementations en Australie, au Royaume-Uni et aux États-Unis a permis à chacun de ces pays d'accroître l'intensité de R-D de dix pour cent ou plus par rapport à la moyenne de l'OCDE. En revanche, la rigidité des réglementations anticoncurrentielles en Irlande, Italie et Portugal a réduit dans ces pays l'intensité de R-D de plus de huit pour cent par rapport à cette moyenne[104]. Les réformes favorisant la concurrence sont donc extrêmement bénéfiques. Cette relation apparaît en outre clairement dans les données d'ensemble, comme en témoigne le tableau 1.

Tableau 1. Effets à long terme d'une augmentation d'un écart-type de divers facteurs[1]

En pourcentage de variation de la variable dépendante

	Dépenses en R-D du secteur marchand	**Total des brevets nationaux**
Institutions et politiques scientifiques		
Indice B[2]	-1¾	-6
Ratio Subventions à la R-D privée / PIB	¼	-3
Part des dépenses R-D du secteur non marchand financée par le secteur marchand	8¼	2½
Ratio R-D du secteur non marchand / PIB	7¼	3¾
Indice DPI	1½	8
Salaire réel des chercheurs aux États-Unis	-3¼	-¾
Années d'études	1	¾
Conditions économiques		
Ratio Bénéfices / PIB	5¼	4¼
Ratio Crédits secteur privé / PIB	-1½	-3¼
Ratio Financement sur fonds propres / PIB	5¾	10
Ratio Stock de R-D étrangère / PIB	12¾	6
Ouverture	-5¾	-4¼
Pénétration des importations	-¼	0
Taux d'intérêt réels	-5	-2¾
Taux de change réel	-3	-1¾

103 Jaumotte et Pain, supra note 45.

104 Id., 14, 25.

	Dépenses en R-D du secteur marchand	Total des brevets nationaux
Politiques cadres (diminution)		
Réglementation des marchés de produits	9	4¼
Restrictions IDE	--	13
Lois de protection de l'emploi	1	6½

1. L'écart-type est la moyenne des écarts-types de l'échantillon par pays, et l'impact d'une augmentation d'un écart-type des facteurs est évalué en moyenne de l'échantillon des variables
2. L'indice B est défini par la formule 1 moins le taux des avantages fiscaux consentis sur la R-D.

Source : Jaumotte et Pain, *supra* note 2, 8.

Plus précisément, il apparaît qu'une réduction d'un écart-type du niveau de la réglementation du marché des produits restreignant la concurrence accroît de neuf pour cent les dépenses en R-D des entreprises. Ainsi, la réforme favorisant la concurrence se place au deuxième rang des facteurs stimulant l'augmentation des dépenses en R-D, loin devant le renforcement des DPI, qui ne produit quant à lui qu'une progression de 1,5 pour cent. D'après les observations, l'assouplissement des réglementations du marché des produits accroît en outre à la fois le nombre de brevets et le pourcentage d'entreprises innovant avec succès[105]. En outre, comme le signalent les auteurs, le tableau indique que « l'argument en faveur d'un nouveau renforcement des droits de propriété intellectuelle pour les détenteurs de brevets dans les pays de l'OCDE paraît peu fondé, notamment pour ceux qui bénéficient déjà d'une protection relativement forte à cet égard. D'après les données recueillies, un tel renforcement augmenterait le nombre de brevets sans avoir d'effet sur les dépenses de R-D »[106].

Il est un aspect pour lequel les données appuient davantage l'optique de Schumpeter, à savoir la différence entre les types d'innovation que recherchent les grandes entreprises installées et celles qui veulent leur disputer la place. Le premier groupe met plutôt au point des inventions qui développent ou prolongent la technologie existante alors que les entrants et les entreprises plus modestes recherchent plus fréquemment une innovation de rupture, susceptible de modifier fondamentalement la nature des marchés. Les nouvelles technologies qui modifient les éléments nécessaires au succès peuvent complètement changer la donne en matière de concurrence. Elles sont donc souvent considérées comme une aubaine stratégique par les entreprises marginales, mais comme une menace par les entreprises dominantes. Ceci vaut même souvent lorsque les entreprises dominantes sont elles-mêmes à l'origine de la nouvelle technologie. Dans ce cas, elles mettent cette technologie en sommeil après l'avoir brevetée, la conservent secrète, ou prennent toute autre mesure nécessaire pour empêcher leurs concurrentes de l'utiliser. C'est pourquoi les véritables percées technologiques – auxquelles pensait Schumpeter en parlant de destruction créatrice – sont souvent mises sur un marché par de jeunes entreprises ou par des entreprises modestes qui opéraient sur d'autres marchés[107]. Les responsables de la concurrence peuvent notamment en déduire que ce type d'innovation a davantage de chances de prospérer sur des marchés où il existe des entreprises de tailles diverses et qui opposent de faibles barrières aux entrants technologiquement novateurs[108].

105 Jaumotte et Pain, supra note 2, 7.

106 Id., 9.

107 Susan DeSanti et William Cohen, "Competition to Innovate: Strategies for Proper Antitrust Assessments," in Rochelle Dreyfuss, Diane Zimmerman et Harry First (éd.), Expanding the Boundaries of Intellectual Property (2001).

108 F.M. Scherer et David Ross, Industrial Market Structure and Economic Performance 654 (3e éd. 1990).

L'un des arguments de Schumpeter en faveur des structures de marché monopolistiques est qu'un monopole peut stimuler l'innovation en donnant à la R-D une plate-forme plus stable. Les études empiriques ne confirment cependant pas que les entreprises relativement importantes ou monopolistes innovent davantage parce qu'elles peuvent fournir un apport de fonds important et stable, réaliser des économies d'échelle ou mieux diversifier leurs risques. Mais rien, qu'il s'agisse de raisonnements théoriques ou de données empiriques, ne permet non plus de conclure catégoriquement que les marchés concurrentiels sont plus propices à l'innovation. Il est de ce fait hors de question actuellement de bâtir une théorie générale de l'innovation et de la concurrence, bien que les multiples travaux d'ordre théorique ou empirique continuent de progresser. Les études intersectorielles portant sur la structure des marchés et la R-D parviennent désormais à des résultats plus solides en se servant de données plus fiables, de mesures plus exactes de la concurrence et de techniques économétriques plus perfectionnées.

Par ailleurs, en l'absence de données permettant de déterminer nettement qu'une concentration plus forte entraîne une déperdition d'innovation, certains commentateurs concluent que les autorités de la concurrence ne doivent pas intervenir sur cette base car elles risquent sans le vouloir de freiner l'innovation au lieu de la stimuler[109]. On peut aussi se demander si les agences publiques sont en mesure de savoir s'il vaut mieux veiller à ce que plusieurs entreprises continuent d'essayer de mettre au point séparément une innovation donnée ou bien éliminer les projets les moins prometteurs, ou présentant un degré élevé de redondance, parmi ceux de diverses entreprises essayant toutes de développer des inventions qui seraient en concurrence.

DeSanti et Cohen estiment que ces appréhensions sont futiles. Pour eux, l'absence de théorie universelle de la concurrence et de l'innovation ne signifie pas qu'il est impossible de comprendre et d'analyser correctement les cas particuliers. Des documents ou témoignages, par exemple, peuvent clairement établir que, pour un cas donné, il est possible d'appliquer pleinement le modèle d'Arrow supposant un monopole ayant intérêt à diminuer, retarder ou arrêter l'innovation. Ils récusent en outre tout attentisme face à des fusions potentiellement nuisibles à la concurrence au motif qu'il est extrêmement difficile de recréer l'innovation perdue, même si l'agence finit par constater qu'il y a bien eu perte. Aussi, DeSanti et Cohen recommandent-ils aux agences disposées à intervenir de le faire dans ce cas avant la consommation de la fusion[110].

4. Conclusion

Les brevets jouent un rôle de plus en plus important dans l'innovation et la performance économique. La relation entre brevets et innovation, qui est complexe, varie suivant les branches d'activité et les caractéristiques des entreprises. Il est généralement admis que les brevets stimulent effectivement l'innovation dans certains secteurs, comme l'industrie pharmaceutique, mais il est difficile de trouver confirmation de cette corrélation pour d'autres, tels que la production de logiciels. L'expansion de la protection conférée par les brevets a néanmoins, semble-t-il, eu une incidence sur le comportement de nombreux types d'entreprises, même si l'impact sur leurs activités innovantes n'est pas toujours très marqué. Pour que les brevets puissent jouer leur double rôle – favoriser l'innovation et diffuser les technologies – les pouvoirs publics doivent faire en sorte qu'ils soient d'excellente qualité. Autrement dit, il convient d'éviter les revendications de trop grande portée, une créativité trop faible et des divulgations insuffisantes, car les brevets présentant ces défectuosités risquent d'engorger le système et d'entraver ainsi l'innovation. Les agences de la concurrence peuvent apporter leur concours en engageant un dialogue avec les offices de brevets et en communiquant leurs réflexions sur la façon dont le système peut être amélioré.

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109 Transcription d'un témoignage aux auditions de la FTC (États-Unis) sur la concurrence globale et basée sur l'innovation (25 octobre 1995) p. 917-19, 922, 926, 930, 995-96.

110 DeSanti et Cohen, supra note 107, 333-34. Pour en savoir davantage sur l'analyse du marché de l'innovation, voir id. 337-341.

La concurrence a elle aussi une incidence complexe sur l'innovation. À l'heure actuelle, nul ne sait exactement comment elle s'exerce, mais il existe de solides raisons théoriques de penser que la concurrence peut freiner l'innovation dans certaines conditions et la stimuler dans d'autres. Au niveau de marchés ou de secteurs particuliers, il semble y avoir un soutien persistant pour l'hypothèse selon laquelle un niveau modéré de concurrence est le plus propice à l'innovation, mais cette idée reste controversée. Au niveau de l'ensemble de l'économie, et d'après des études ayant examiné pour divers pays le degré de réglementation anticoncurrentielle du marché des produits, certains indices permettent de croire que la concurrence est en corrélation positive avec l'innovation.

BELGIUM

1. Patents and Innovation

1.1 Patent scope

Belgian patents are delivered without preliminary examination to the scope of protection indicated in the patent application. Ultimately, if an alleged infringement has occurred to one's rights, the court will decide upon the patent scope.

A European patent, on the other hand – valid in the territory indicated in the patent application - is granted after novelty search and examination of the patentability done by the European Patent Office. A number of opposition procedures – in which competitors on the market are involved - concern in fact the scope of the patent.

Quality of the patent is very important for the patent system being able to fulfil its task to promote innovation. The scope of patent protection must be justified by the non obviousness of the invention and must not cover what is not novel.

Patents, providing an exclusive exploitation right to the patent holder is always limited in time. For certain industries, such as the pharmaceutical industry, the usual patent term is not even sufficient to enable the business that has made all the effort and investment in research and development, to recover these costs. Therefore, a Regulation[1] on "supplementary protection certificates" has been introduced which provides a maximum of 5 extra years of protection similar to patent protection.

1.2 Patentability

During the debate on the European Directive on the patentability of in computer implemented inventions, a fierce opposition existed from the free software industry to make those inventions subject to patent protection (open source).

Another discussion involves the issue of the use of genetic resources in patent applications. Recently, in response to an international demand (Convention on Bio Diversity), the Belgian patent law has introduced an obligation for the patent applicant to mention the geographical origin of the genetic resources, used in the patent application.

1.3 Recent changes

The most important recent changes in Belgium

By law of 28 April 2005 concerning the patentability of biotechnological inventions, the Belgian patent law of 28 March 1984 has been amended.

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[1] Council Regulation (EEC) N0 1786/92 of 18 June 1992 concerning the creation of a supplementary protection certificate for medicinal products, O.J., L. 182, 2 July 1992.

The reason why changes were made:

To transpose the European Directive on Biotechnological inventions 98/44/EG of 6 July 1998.

The effect on innovation of those changes:

The Biotechnological inventions are of utmost importance for the Belgian economy, especially in the human an animal pharmacy, vaccines, etc. The European directive and Belgian law constitute a factor of legal certainty in favour of the development of the investments in a key area with future for Europe.

1.4 Further changes

- Law projects have being discussed concerning counterfeiting and piracy. One project contains criminal law provisions for the implementation of the (EC) Regulation n° 1383/2003 of 22 July 2003. Another project contains civil law provisions to implement the European Directive 2004/48/CE of 29 April 2004 concerning the enforcement of intellectual property rights;

- A Law project introducing a written opinion is being will be introduced in the near future with the aim to enhance the patent quality. The introduction of the written opinion give to the patent applicant an advice on the patentability of the object of his patent application. It will give the opportunity to the patent applicant to eventually adapt the scope of his application or to withdraw it;

- A Law providing a reduction of the search fee will be introduced in the near future. This modification of the Belgian law aims to improve the accessibility to the patent system by Small and Medium Enterprises;

- A Law project concerns the transposition in the Belgian patent law of the European Patent Convention 2000 (European Patent Organisation), of the Patent Law Treaty (World Intellectual Property Organisation) and the electronic handling of patent applications and patents.

2. Concurrence et Innovation

Dominance et innovation: Cela dépend des cas et des secteurs. Si nous prenons l'exemple du dossier Banksys, La position dominante de Banksys en Belgique se maintient du fait que Banksys a toujours innové et s'est toujours tenu à la pointe du progrès technologique.

Par contre dans le secteur des télécommunications , par exemple, nous avons remarqué que l'innovation était surtout due à l'entrée sur le marché de nouveaux opérateurs et que l'opérateur historique et dominant a été obligé d'innover pour se maintenir dans la course.

Concentrations et innovation: En Belgique, nous n'avons pas eu de cas où l'innovation était le facteur principal de la concentration et a été dès lors acceptée pour cela. Les entreprises reprennent souvent dans les notifications de concentration l'argument que cette dernière favorisera une synergie qui sera profitable à la R&D et dès lors à l'innovation, mais ce n'est qu'un argument parmi beaucoup d'autres. Cela n'a jamais été l'argument prépondérant pour autoriser une concentration. Néanmoins la loi belge sur la protection de la concurrence économique prévoit que le Conseil de la concurrence tient compte, pour prendre sa

décision, notamment de l'évolution du progrès technique et économique pour autant que celle-ci soit à l'avantage des consommateurs et ne constitue pas un obstacle à la concurrence.

Raisons pour innover: Nos investigations n'ont jamais porté principalement sur les raisons qui poussaient une entreprise à innover. Aucune étude n'a d'ailleurs jamais été faite en ce sens.

Remèdes, sanctions et innovation: l'Autorité belge de concurrence n'a pas eu de cas où des remèdes ou des sanctions ont été seulement imposés pour que les entreprises n'affectent pas les incitants pour créer l'innovation, mais des remèdes ont déjà été imposés ayant eu pour conséquence de ne pas entraver l'innovation.

La partie "Brevets et Innovation" a été rédigée par l'Office de la Propriété Intellectuelle.

CANADA

1. Introduction

There is no question that innovation is a key determinant of productivity and economic growth. In recognition of this, governments typically utilise many different policy instruments in an effort to stimulate the level of innovation in their economies. These have ranged from direct mechanisms such as funding of specific projects at government laboratories to more indirect means such as R&D tax breaks, subsidies or general funding for university research. In addition to these policy instruments are framework laws such as intellectual property ("IP") and competition laws. IP laws provide property rights comparable to those for other kinds of private property, thereby providing incentives for owners to invest in creating and developing innovations and encouraging their efficient use and dissemination within the marketplace. Applying competition laws to conduct associated with IP serves to prevent anti-competitive conduct that impedes the efficient production and diffusion of goods and technologies and the creation of innovative new products. The promotion of a competitive marketplace through the application of competition laws is consistent with the objectives underlying IP laws.

The outline for this submission is as follows: First, there is a discussion of the Competition Bureau's ("Bureau's") *Intellectual Property Enforcement Guidelines* ("IPEGs") and how they are important in providing transparency and predictability to firms investing in innovation. A recent example of the importance of guidelines is drawn from a Federal Court of Appeal ("FCA") decision in Canada. Second, there is a discussion of the Bureau's ongoing research initiatives, undertaken in cooperation with other government departments responsible for IP policy, intended to encourage the adoption of competition principles in the setting of IP policy as well as to ensure that the Bureau's enforcement approach in the area of IP remains up-to-date. Finally, there is a discussion of three previous Bureau merger investigations where innovation was considered in the Bureau's analysis of competition issues.

2. The Bureau's Intellectual Property Enforcement Guidelines[1]

Firms in industries where innovation is considered extremely important, such as pharmaceuticals, software, biotechnology and telecommunications, face tremendous technological risk due to the inherent uncertainty of scientific research and development. In addition to this risk firms also face additional uncertainties, such as the risk that once a critical innovation is developed and attempts are made to commercialise it, other firms may cite patent infringement or the government may intervene and order compulsory licensing or restrict the type of business arrangements and transactions that a firm may engage in. Many risks are inherent to the environment and cannot be mitigated. However, some uncertainties, such as those posed by possible government interference in the market can be reduced through clear articulation of government policy. In the domain of competition policy, antitrust agencies can go a long way to alleviate the uncertainties high-tech industries face by publishing guidelines as to how they intend to enforce competition statutes with respect to matters involving IP as well as pronounce on how innovation will be taken into account in mergers and in other situations where there may be competition concerns. By providing clarity, government policy creates an environment more conducive to innovation.

1 For a copy of the Guidelines go to: http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=1286&lg=e.

With the goals of transparency and predictability in mind, the Bureau released its *Intellectual Property Enforcement Guidelines* ("IPEGs") in the fall of the year 2000. The drafting of the guidelines was a very intensive exercise: it lasted over two years; involved several rounds of consultations with the public and the Bureau engaged a group of expert advisors for intellectual support. The devotion of time and resources to the development of the guidelines was for good reason. Several provisions of Canada's *Competition Act* ("Act") mention IP explicitly, and one in particular, provides the Federal Court with the authority to order a nullification or revocation of IP rights when they are used in a manner that creates an undue lessening of competition.[2] Given the nature of its competition statute, it was important for the Bureau to articulate to stakeholders how it would interpret this and other provisions of the *Act* in matters involving IP. By doing so, it hoped to provide a more stable domestic environment in which both Canadian and foreign firms could invest for the purpose of innovation.

There are three fundamental principles laid out in the IPEGs that govern the treatment of intellectual property under Canada's *Competition Act*. Taken together, they enable competition law and intellectual property laws, including patent law, to work together to foster innovation and economic efficiency.

The first principle is that, for the purposes of competition analysis, IP should be treated as any other property. This has two implications. First, IP laws do not differentiate IP from other forms of property. This is not to suggest that there aren't differences between the characteristics of IP and other kinds of property rather that the *Competition Act* and the standard analysis applied in its enforcement are sufficiently flexible to account for these differences. Second, because IP is traded within an economy by the same mechanism that directs the trade of other forms of property, society should benefit from the application of the *Competition Act* to IP for the same reasons it benefits from the application of the *Act* to other forms of property.

The second principle is that an IP owner's inherent right to prevent others from using its IP, does not necessarily imply that the owner has market power. Market power refers to the ability to cause price, quality, variety, service, advertising, innovation or other dimensions of competition to deviate from competitive levels. This ability depends on the extent to which effective substitutes constrain the ability of the IP owner to exercise power over price or the other elements of competition and the only way this can be determined is by explicit reference to the actual economic circumstances on a case-by-case basis. Only in some cases will the single product associated with an IP right constitute an anti-trust market that would warrant concerns over market power.

The third principle is an affirmation of the pro-competitive nature of IP licensing. This principle flows from an understanding that intellectual property laws exist to facilitate exchange within the market system. Licensing represents the trading and exchange of IP, which IP rights are in part designed to facilitate and promote. In this regard, the exchange or licensing of IP should generally be considered to contribute positively to the competitive market process and therefore be viewed as being pro-competitive.

Taken together, the three principles convey to stakeholders that the Bureau approaches the competition law/IP right interface from the broad perspective that the two legal regimes are both necessary ingredients to the goal of promoting the efficient operation of the competitive process. From the Bureau's perspective these principles provide a sound basis for a practical application of the *Competition Act* to IP right issues and respect the role that innovation plays in fostering productivity and economic growth.

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[2] Provisions in the Competition Act explicitly referring to IP include: section 61 prohibiting price maintenance; section 77 concerning exclusive dealing, tied selling and market restriction; section 86 concerning specialization agreements; section 79 prohibiting abuse of dominance; and section 32 concerning special remedies.

2.1. Section 32

In addition to explaining the Bureau's general view of the interface between IP and competition law, the IPEGs also describe the Bureau's enforcement approach to one particular provision in the *Competition Act*—section 32. This provision explicitly concerns the use of exclusive rights and privileges conferred by patent, trademark, copyright or registered integrated circuit topography so as to unduly lessen or prevent competition.[3] Given that the remedies available to the Federal Court under this provision include invasive measures such as the nullification of IP rights, many stakeholders are understandably concerned as to the circumstances under which this provision would be applied. This concern is heightened by the fact that there exists no jurisprudence with respect to this provision.[4]

The IPEGs spell out a two-step approach to the application of section 32. In the first step, the Bureau seeks to establish whether the mere refusal of an IP right has adversely affected competition to a degree that would be considered substantial in a relevant market that is different or significantly larger than the subject matter of the IP or the products or services which result directly from the exercise of the IP. To make this determination the Bureau would consider whether (i) the holder of the IP is dominant in the relevant market, and (ii) the IP is an essential input or resource for firms participating in the relevant market.

In the second step, the Bureau seeks to establish whether invoking a special remedy under section 32 against the IP holder would <u>not</u> adversely alter the incentives for firms to invest in research and development. This last requirement is recognition that IP rights are important for providing incentives for R&D and that by targeting a right by way of a remedy, should not undermine this general incentive mechanism.

By clarifying its approach to this provision, the Bureau, through its IPEGs, fulfilled a very useful role—that of providing assurance, not only to firms in high-tech industries, but all firms with IP assets, that the Bureau would use section 32 judiciously and not use it to punish firms that may have simply become dominant by way of break-through innovations. By providing transparency and predictability, the Bureau hopes to diminish, in part, some of the uncertainties that innovators face and therefore, furnish a more stable environment for investment in research.

3. The Importance of Guidelines

The importance of having guidelines became apparent in a matter involving private litigants before Canada's Federal Court of Appeal ("FCA"). The case in question involved Eli Lilly and Company and Eli Lilly Canada ("Lilly"), suing Apotex Inc. ("Apotex"), a Canadian producer of generic pharmaceuticals, for infringing patents relating to the manufacture of an antibiotic named cefaclor. In its defence, Apotex launched a counterclaim, alleging that Lilly violated section 45 of the Canadian *Competition Act*—the conspiracy provision—by conspiring with Shionogi, a Japanese pharmaceutical firm, to monopolise the Canadian market for cefaclor. The allegations in the case were that Lilly had the patents for one of the two known commercial processes to develop cefaclor and Shionogi had the patents for the other. In 1995, after Lilly's patent on the cefaclor molecule itself had expired, Lilly acquired Shionogi's process patents thus giving Lilly control of the patents for both commercial processes. It was alleged that this allowed Lilly to monopolise both known manufacturing methods for cefaclor and thus control the market for bulk cefaclor itself.

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[3] The complete text to section 32 is provided in Annex A.

[4] Section 32 has only been employed twice by the Attorney General of Canada and in both instances the cases were settled out of court. The last settlement occurred in 1971.

Lilly and Shionogi filed motions to dismiss Apotex's counterclaim on the grounds that the assignment of a patent could not create an undue lessening of competition, which is the test required under section 45. Their position was based, in part, on the fact that a patentee is granted a statutory "monopoly" under the *Patent Act* and is given the accompanying right to assign it to others. They submitted that any lessening of competition created through an assignment of a patent is explicitly sanctioned by the *Patent Act* and therefore, cannot be undue for purposes of the *Competition Act*. In a summary judgment proceeding, the Federal Court accepted Lilly's position, and struck out the portion of Apotex's counterclaim alleging a violation of section 45. In handing down his reasons, the Federal Court judge opined that his decision was consistent with the Bureau's IPEGs.

Apotex appealed the Federal Court ruling to the Federal Court of Appeal and the Competition Bureau was granted leave to intervene in the proceedings. As an intervener, the Bureau was able to explain that, contrary to the interpretation by the Federal Court, the IPEGs view a patent assignment as something beyond the mere exercise of an IP right and thus subject to the criminal and civil provisions of the *Competition Act*, including section 45. The Bureau also explained to the FCA that a patent "monopoly" is different than the antitrust concept of market power and that an assignment of a patent such as that from Shionogi to Lilly could have the potential to increase Lilly's market power beyond what was contemplated under the *Patent Act*. The FCA held that Canada's Parliament did not intend, by authorising assignments of patents generally, to exempt such assignments from Canada's cartel law, as a framework economic law of the country, and that the IPEGs did not support such an approach. Consequently, the FCA allowed Apotex its appeal and remanded the matter back to the Federal Court.

4. Bureau Research Initiatives

Currently, the Bureau is partnering with other government departments responsible for setting and administering IP policy in a research initiative examining topics at the interface between competition and IP law. This initiative follows a similar one the Bureau undertook over 10 years ago which resulted in the publication of a research volume titled, *Competition Policy and Intellectual Property Rights in the Knowledge-Based Economy* and fed into the development of the Bureau's IPEGs.

In the current initiative, the Bureau and its co-sponsors have created an international editorial panel to oversee the work on six research topics. These include: authorised generics, collective management of copyright, extension of IP rights, compulsory licensing, tying/bundling in the IP context, and Canadian patent law in the international context. Legal and/or economic scholars have begun drafting reports on each of the topics. The Bureau will host a symposium in February 2007 with approximately 50 participants consisting of academics, practitioners and government representatives with responsibilities concerning competition or intellectual property policy. The symposium will be an opportunity for the authors to present their research and all participants to have an in-depth discussion of the issues.

It is hoped that the research stemming from this exercise will serve to provide guidance on future Canadian IP policy development, as well as provide an opportunity for the Bureau to re-examine its enforcement approach to matters involving IP to ensure it still reflects modern economic thinking.

The following list provides more information on the topics under study.

4.1 Authorised Generics

This study will examine the extent to which brand-name pharmaceutical companies in Canada have launched authorised generics (i.e., generics licensed by brand-name firms just before patent expiry) and the impact that these drugs have had on competition.

4.2 Collective Management of Copyright

This study will examine Canada's current system of copyright collectives and determine, given the current state of technological development, whether it is functioning well in terms of minimising transactions costs and encouraging the creation and dissemination of works.

4.3 Extension of IP Rights

This study will examine some of the ways that firms have attempted to extend their IP rights beyond what was initially provided by statute. Examples include attempts to use trademark law to extend patents and attempts to extend patents by way of settlement agreements.

4.4 Compulsory Licensing

This study will examine Canada's existing provisions for compulsory licensing which include sections 19 and 65 of the *Patent Act*, and section 32 of the *Competition Act*, to determine whether these have met their legislative intent. The study will also explore alternative models for compulsory licensing and the appropriate division of responsibility among the Commissioner of Patents, the Commissioner of Competition and the Courts.

4.5 Tying/Bundling in the IP Context

This study will include a systematic review of the economic literature on tying and bundling in relation to the exercise of IP rights. The focus will be to determine the circumstances where these practices could extend IP protection and block innovation by deterring entry and investment, to better inform enforcement policy.

4.6 Canadian Patent Law in an International Context

This study will compare and contrast Canada's patent regime with its obligations under international treaties with a view of determining whether there is scope to improve the current regime to better foster innovation and competition.

In addition to the above research, the Bureau is also pursuing further study on the issue of innovation and dynamic efficiencies in merger review. In particular, the Bureau is interested in the measurement of dynamic efficiencies, and is looking at whether certain indicators could be used to assess whether a transaction is likely to increase or decrease the level of innovation in a market, or lead to a gain or loss of dynamic efficiency.

5. Bureau Cases Involving Innovation

The Competition Bureau has had three relatively recent merger investigations where innovation has been a consideration in its analysis. In the *Rogers/Microcell* transaction, the pace of innovation in the industry was a factor in not challenging the merger. In both the *Pfizer/Pharmacia* and *Bayer AG/Aventis Cropscience* transactions, the Bureau concluded that the mergers would, if allowed to proceed without a remedy, have a negative impact on product innovation and development.

5.1 Rogers/Microcell[5]

In 2004 the Bureau investigated a merger in the telecommunications industry between Rogers Communications Inc. and Microcell Telecommunications Inc., two Canadian wireless service providers. The transaction raised competition issues with respect to the potential removal of Microcell as a vigorous and effective competitor in the provision of mobile wireless services in Canada. The Bureau was concerned with both the potential exercise of unilateral market power and coordinated behaviour post-merger.

The role of change and innovation had an important impact on the Bureau's conclusions in this matter. The rate of growth in the mobile telecommunications market over the six to seven years after the merger was expected to be significant. At the time of the merger, it was estimated that the wireless industry had penetrated 44% of the population base but that was expected to grow to a 70% penetration level.

Advances in mobile handset technology were rapidly bringing newer and more advanced services to market and placing an increasing load on existing infrastructure. This, in turn, required additional capital investment in existing and new technologies in order to strengthen the underlying networks and support the continued rollout of these services.

At the same time, advances in broadcast distribution and telecommunications were providing new delivery mechanisms, allowing for greater convergence between these traditionally separate market segments.[6] This led incumbents in both markets to increasingly rely on bundled service offerings to attract and/or retain their customer base. Bundling provided a competitive advantage to integrated firms who could more readily combine their wireless services with other telecommunications services, broadcasting services or Internet access.

As a result of the transaction, there would be three mobile wireless operators remaining post-merger and the Bureau determined that Rogers would have a significant market share in the provinces of Ontario and British Columbia. However, given the amount of subscriber growth that was expected in the industry, as well as the prospects for technological change, the Bureau did not view current market shares as an adequate indicator of how much market power individual companies would have in the future. As a result, the Bureau concluded that post-transaction, Rogers would not possess sufficient market power to impose and sustain a significant and non-transitory price increase above levels that would have existed in the absence of the merger because rivals would likely respond in an effort to enhance their customer bases. The Bureau felt that innovative product and service offerings would continue to be available to consumers at competitive prices. In particular, because Rogers was a cable company and did not own telephony wireline infrastructure, the Bureau saw Rogers as having an incentive for it to continue to offer some of Microcell's more aggressive marketing features in an effort to move customers away from the traditional services offered by incumbent local exchange competitors.

Given the level of innovation and technological change in the wireless industry, the Bureau also concluded that the transaction would not likely result in coordinated conduct. As noted previously, the mobile wireless services market was in a period of rapid growth, which was expected to continue for a number of years. This growth would create a greater impetus for wireless providers to capture as many customers as they could in an effort to secure long-term customer loyalty. A principal way for providers to

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5 For a backgrounder on this case go to: http://www.competitionbureau.gc.ca/internet/index.cfm?itemID=257&lg=e.

6 Advancements in Voice over the Internet and delivery of video through DSL telephone lines are two examples of the technological changes that were driving these markets.

gain customers was to continue with rapid and frequent product or service innovations. Given the dynamic nature of the industry, it seemed evident that there were significant disincentives for participants to act in a coordinated fashion.

The final element resulting in the Bureau not challenging the merger was its determination that Microcell would face significant challenges going forward in implementing its current business plan. Although in no way considered a "failing firm", Microcell nonetheless required significant additional capital investments in order to support the increased load resulting from its product offering. This in turn placed pressure on its ability to support funding for the next generation of product and service offerings, as well as other important company initiatives that were intended to allow it to compete on a more even basis with other competitors in the market. At the same time, its competitors were moving forward with significant capital investment in newer generations of technology and network enhancements and were preparing to launch new product offerings.

5.2 Pfizer/Pharmacia

In 2002, the Competition Bureau conducted an examination of Pfizer's proposed acquisition of Pharmacia Corporation. In its assessment of the proposed transaction, the Bureau identified competition concerns with respect to several markets involving pharmaceuticals used to treat human afflictions. Notably, for some of these markets the merging companies were not current competitors. Instead, one merging party had a product in development ("pipeline product") that was expected to compete with a product of the other merging party that was currently on the market. The Bureau concluded that the proposed transaction would create a disincentive for the merged entity to continue with the development of new products and thus there would be a loss of potential competition in markets for the treatment of particular human health conditions.

Importantly, in keeping with its IPEGs, the Bureau did not utilise an innovation market approach. Instead, it defined markets around products used for the treatment of particular afflictions and determined whether products in development would be effective competitors to existing products within those markets. The existence of pipeline products allowed the Bureau to more accurately assess if, and to what extent, these products were functionally interchangeable with existing therapies than if an innovation market approach were used.

The degree of competition for actual products and for innovation provided by competitors in the pharmaceutical industry varies by product. Partly due to patent protection, there are often very few functionally interchangeable products within categories of human pharmaceuticals, thereby reducing the number of effective competitors. The pharmaceutical industry experiences constant change and innovation. Many studies and market contacts have indicated that in order for a company to remain profitable, it must maintain a steady stream of new and innovative products in its pipeline. This is largely driven by ongoing investment in R&D, which is crucial to a company's viability. Because change and innovation is continuous and rapid, current market shares may not be indicative of market power. A newly introduced product with a low market share may become the market leader in a very short time if it has superior characteristics or performance. In the same way, an older product with high market shares may become obsolete with the introduction of either a new generation chemical or the introduction of generics.

The Bureau concluded that the transaction would substantially prevent competition in the market for pharmaceutical products used in the treatment of human sexual dysfunction. Pfizer's Viagra represented a very high market share of sales of products used to treat erectile dysfunction, however, competing products were expected from at least two competitors; one of them was Pharmacia's pipeline intranasal apomorphine. The Bureau also determined that the transaction would substantially prevent competition in the market for pharmaceutical products that treat urinary incontinence. Pharmacia had a significant share

of sales for this type of product and was the market leader in Canada with its products, Detrol and Unidet. It was determined that there was the potential for significant overlap as both Detrol (Pharmacia's product) and Darifenacin (Pfizer pipeline product) were aimed at similar populations.

On April 11, 2003, the Bureau registered a consent agreement with the Competition Tribunal to remedy the competition concerns arising from the transaction. To remedy these concerns, the parties agreed to terminate a collaboration and license agreement between Pharmacia and Nastech Pharmaceuticals Inc. involving a developmental intranasal apomorphine, and to divest another pipeline product to Neurocrine Biosciences Inc. These divestitures ensured the continued development of these products for eventual introduction into a Canadian market currently dominated by Pfizer's product, Viagra. To remedy concerns about products that treat overactive bladder problems, the parties agreed to divest Pfizer's developmental product, Darifenacin, to Novartis Pharma AG.

5.3 Bayer AG/Aventis Cropscience

Also in 2002, the Competition Bureau reviewed the proposed acquisition of Aventis CropScience Holdings S.A. ("ACS"), constituting the worldwide agrochemical business of Aventis S.A., by Bayer A.G. At the time, both parties were active in the crop protection business. The proposed transaction involved the purchase by Bayer of the manufacture and supply of: insecticides, seed treatments, herbicides, fungicides and professional-use pesticides of ACS Canada. Pesticides are made up of chemical formulations of active ingredients that can be grouped by chemical family or by mode of action, the process by which the pesticide kills the pest. Chemical families or classes may be divided into two sub-categories: old and new. New chemistries are attractive to users since they typically offer a new and different mode of action, different application rates as well as lower toxicity levels. New chemistries are developed by crop protection companies to provide the basis for formulating new products and to increase market share. The creation of a new pesticide involves the R&D of a new active ingredient, that is, the chemical reactor that creates the mode of action against the targeted pest.

Companies engaged in the crop protection business continually develop new generation products to provide users with the ability to adapt to changes in the environment and to control pests that develop resistance to pesticides after long-term use. Products based on new chemistries may discipline an incumbent's market position provided they have equal or higher efficacy rates.

The Bureau concluded that the proposed transaction would likely lessen or prevent competition substantially in a number of relevant markets including: insecticides for certain fruit and vegetable crops in Canada (namely potatoes, apples, tomatoes and leafy vegetables); seed treatments for canola in Canada; seed treatments for cereals (wheat and barley) in Canada; and grassy weed herbicides for spring wheat in Western Canada. This conclusion was based on several factors: high market shares, high barriers to entry that include sunk R&D costs and a lengthy and expensive process for regulatory approval, limited foreign competition and the absence of effective substitutes.

With respect to the insecticide market, the Bureau determined that there were six major research-based suppliers in Canada, but all of them, other than Bayer, had products based on older chemistries that were being phased out and replaced by newer chemistry products. Indeed, Bayer was the only firm that had a product, marketed under the brand-name "Admire," that was based on a new family of chemicals known as chloronicotinyls. ACS, however, had a chloronicotinyl product of its own in development that was expected to reach the market within two years. Because ACS's product, known under the brand-name of "Assail", was likely to be a close competitor to Bayer's Admire product, the Bureau concluded that the merger would likely cause a substantial prevention of competition.

Similarly, with respect to the canola seed treatment market, the Bureau determined that Bayer, indirectly through another company known as Gustafson, had launched an innovative new product, known under the brand-name "Gaucho," that was a chloronicotinyl based product. ACS was in the process of developing its own chloronicotinyl product that would compete with Bayer's product and that of Syngenta, another pesticide producer. The Bureau determined that for the next several years, Bayer (through Gustafson) ACS and Syngenta, likely would be the only companies that would develop and introduce new seed treatment products based on chloronicotinyls. For this reason, the Bureau concluded that the transaction, if allowed to proceed, would cause a loss in the development of new seed treatments.

On July 19, 2002, the Competition Tribunal issued a consent order to remedy competition concerns raised by the transaction. It required Bayer AG to divest three key agricultural chemical products and to license a fourth in its crop protection division. The Tribunal had issued an interim consent order on June 6, 2002, to ensure that the designated assets were separated and managed independently from Bayer's other business operations. On January 21, 2003, the Bureau announced that Bayer AG had complied with the provisions of the consent order, and the Bureau approved the following divestitures: Arvesta Corporation would acquire certain assets of the flucarbazone business (including Everest, a spring wheat herbicide); BASF AG would acquire certain assets of the triticonazole business (including Charter, a cereal seed treatment); and Nippon Soda Co. Ltd. would acquire certain assets of the acetamiprid business, including a licence for Iprodione. In partnership with a Canadian licensee, Nippon would then be able to manufacture and develop Assail, a fruit and vegetable insecticide, and Assail ST, a canola seed treatment. These divestitures ensure competitive prices for distributors and farmers in the Canadian pesticides industry. The consent order was notable for certain "crown jewel" provisions included to ensure the success of the divestitures and to remedy the competition concerns identified by the Bureau. Close coordination with the US Federal Trade Commission and the Merger Task Force of the European Commission ensured appropriate and consistent remedies.

ANNEX A: SECTION 32 OF THE CANADIAN COMPETITION ACT

32 (1) In any case where use has been made of the exclusive rights and privileges conferred by one or more patents for invention, by one or more trade-marks, by a copyright or by a registered integrated circuit topography, so as to

(a) limit unduly the facilities for transporting, producing, manufacturing, supplying, storing or dealing in any article or commodity that may be a subject of trade or commerce,

(b) restrain or injure, unduly, trade or commerce in relation to any such article or commodity,

(c) prevent, limit or lessen, unduly, the manufacture or production of any such article or commodity or unreasonably enhance the price thereof, or

(d) prevent or lessen, unduly, competition in the production, manufacture, purchase, barter, sale, transportation or supply of any such article or commodity,

the Federal Court may make one or more of the orders referred to in subsection (2) in the circumstances described in that subsection.

(2) The Federal Court, on an information exhibited by the Attorney General of Canada, may, for the purpose of preventing any use in the manner defined in subsection (1) of the exclusive rights and privileges conferred by any patents for invention, trade-marks, copyrights or registered integrated circuit topographies relating to or affecting the manufacture, use or sale of any article or commodity that may be a subject of trade or commerce, make one or more of the following orders:

(a) declaring void, in whole or in part, any agreement, arrangement or licence relating to that use;

(b) restraining any person from carrying out or exercising any or all of the terms or provisions of the agreement, arrangement or licence;

(c) directing the grant of licences under any such patent, copyright or registered integrated circuit topography to such persons and on such terms and conditions as the court may deem proper or, if the grant and other remedies under this section would appear insufficient to prevent that use, revoking the patent;

(d) directing that the registration of a trade-mark in the register of trade-marks or the registration of an integrated circuit topography in the register of topographies be expunged or amended; and

(e) directing that such other acts be done or omitted as the Court may deem necessary to prevent any such use.

(3) No order shall be made under this section that is at variance with any treaty, convention, arrangement or engagement with any other country respecting patents, trade-marks, copyrights or integrated circuit topographies to which Canada is a party.

CZECH REPUBLIC

1. Introduction

Research and development process is perceived by the Office for the Protection of Competition of the Czech Republic ("the Office") as a procompetitive factor, whose results may be reflected by introduction of new products and services to the market and increase of consumer benefit. It is obvious that consistent and intensive economic growth cannot be achieved without innovation of products and services as well as the used technologies. Such innovation is a precondition for development and maintenance of competitiveness of industrial sectors and thus also the whole economy on international markets.

It results from comparison in international context that the Czech Republic´s main lag in the discussed areas is the low number of applications for patents and the low number of patents actually given. In comparison with the EC members the Czech Republic achieves even less than 5% of their average. There are many reasons for this dissatisfying situation, from financial demands and complexity of the patent process, underestimation of protection of intellectual and industry rights to insufficient knowledge of their protection.

However, **the trend in issuing patents is increasing in the Czech Republic** (e.g. in 2005 there was a 2% increase in comparison with 2004). This may lead to increasing competition concerns caused by the possibility that the patent or know-how owner may become surrounded by an impenetrable barrier preventing other competitors from innovating[1]. On the other hand, such problem may be solved e.g. by means of cross-licences and patent pooling[2].

Existence of rights ensured for the patent owners may not be challenged on the basis of the Czech competition law. Licensing of an exclusive right to use IP rights is a matter of public interest. The task of the Czech Competition Office in this case is determining the line between **the very existence of patents** and **performance of this right** in a particular case. When the use of an IP right becomes an object, means or a result of an anticompetitive conduct, e.g. a contract distorting competition, **the IP right holder may not act in anticompetitive way.** This results from the fact that it is also in the interest of consumers to preserve functioning market structure and competition.

Protection of industrial property rights in the Czech Republic is performed by **Industrial Property Office** (hereinafter "IP Office"), which, from its position of a central administrative authority, plays especially the role of a patent and trademark office. Competition issues in the IP area are dealt with by the Office for the Protection of Competition within the scope of its general powers in the competition protection field.

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1 For example professor Carl Shapiro introduces so called „patent thicket" concept in „Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard-Setting" in Innovation Policy and the Economy Volume I (Adam B. Jaffe et al. Eds., forthcoming 2001)

2 United States Patent and Trade Market Office. „Patent pools: A solution to the problem to access in Biotechnology Patents?" (Jan. 19 2001)

One of the main tasks of the IP Office is the enforcement of intellectual property rights. In April 2006, the EC Directive on enforcement of Intellectual Property Rights[3] was implemented into the Czech legal order by amending the Intellectual Property Protection Law and new Act on enforcement of IP Rights. One of the main goals of the new legal regulation is unification of the IP protection means for all the subjects of IP rights (patents, industrial patterns, trademarks) without affecting the rules of competition.

The Competition Office considers the issue of research and development also in assessing the size of barriers to entry for a new undertaking, in the extent corresponding with the costs of a potential competitive undertaking. The assessment of barriers to entry existence is carried out by the Office in the framework of assessing potential competition, i.e. in assessing the offer substitution in individual cases of antitrust and concentration of undertakings.

2. Activity of the Office

In 2000, the Office carried out an analysis of economic advantages for intended concentrations of undertakings presented by the parties[4] to proceedings in years 1995-2000. **The analysis revealed a significant number of cases, where the parties introduced as the reason for approval of a concentration "ensuring know-how in technologies, joint research, acquiring the most up-to-date findings from the technological development in the given sector (patents), or optimisation of technology development".**

The results of the analysis confirmed the general innovative trend in the ongoing restructuring of the Czech economy, strengthening of the innovative dynamics of the sector with other factors for removal of barriers to entry to the market and preservation of effective competition on the markets. As a result, relatively very fast introduction of new products with higher quality and lower price in favour of consumers was enabled.

As results from the Office´s practice, among the markets with the highest innovative dynamics belong especially **informational technology markets, telecommunication and pharmaceutical markets.**

The fact that the outputs from the research and development projects, which usually require considerable human and financial resources, are very risky, leads to the necessity of protecting new patents and know-how acquirement, with respect to their benefit for the whole society. The protection, however, must not be absolute, and for this reason the Office, alike the other OECD countries, assessed in the IP rights cases especially the danger for competition resulting from the protection of such rights. Above all, **the principle that IP rights protection must not prevent competition on the given relevant market and that due to approval of concentrations a dominant undertaking capable of eliminating the future competition on the market must not be created,** was enforced**.**

2.1 Area of concentrations between undertakings

The experience of the Office from the IP protection area and possible impacts of this protection on competition were acquired especially in the merger cases, where a dominant position on a company was created or strengthened, capable of distorting future effective competition. In such cases, the Office used its possibility to ask the parties to a proceeding for commitments consisting in sale of IP rights to independent third parties.

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3 Directive 2004/48/EC of the European Parliament and of the Council on the enforcement of intellectual property right

4 Economic advantages had presented important criterion for merger approval before the Act on the Protection of Competition was amended in 2001.

In assessing concentrations of undertakings, the Office proceeds in line with the EC Council Merger Regulation. The Office considers all the justified and probable efficiencies to be brought about by the merger**.** It is possible that benefits resulting from a concentration may neutralise its negative effects on competition, especially the potential detriment to consumers and that the concentration need not to prevent significantly efficient competition on the market. One of the possible benefits may dwell also in so called **dynamic efficiency,** i.e. reaching optimum level of innovation, development and establishment of new products increasing the consumers´ welfare. The increase in welfare may follow from rationalisation of expenditures on research and development, which will prevent doubling the expenditures for achievement of innovation in one area and on the contrary will regulate the flow of saved expenditures into other areas of possible research.

The fact that the Office, in assessing concentrations, takes regard also of research and development is also legally regulated in Article 17, par. 1 of the Czech Competition Act. The Act explicitly deals with a concept of "research and development, whose results are beneficial for consumers and do not prevent effective competition". **The Office assesses the level of research and development on relevant markets and the way in which the research and development shall be influenced by the given concentration.** Concentration of undertakings may result in inhibiting the intensity of research and development in a given sector, in case where a concentration of the biggest market players that had achieved most of the innovations. On the other hand, a concentration may result in strengthening the innovation dynamics, when the higher economic and financial power enables the entity established by the concentration to compete effectively an undertaking being a leader in introducing new products and services to market. In such case, a merger may lead to development of competition on the given market.

- ***Case study -*** Zentiva B.V. S.L. a PHARMA HOLDING GESELSCHAFT M.B.H.

In 2003, the Office approved a concentration of undertakings Zentiva B.V. S.L. a PHARMA HOLDING GESELSCHAFT M.B.H., operating on the pharmaceutics market, subject to number of commitments adopted in favour of preserving and development of competition. Pharmaceutical sector is among the sectors, whose major feature is high innovation dynamics and where patents play a very significant role. Strong regulation is also characteristic for the market, consisting in necessity of registering every single medicament by the State Office for Control of Medicaments. There also exist traditional trademarks and a system of reimbursing the medicaments from the system of public insurance. In assessing the given concentration, the Office found that the financial and portfolio power of the new entity would be strengthened, which would also be projected in providing a huge scale of renown products, higher price flexibility and increase in bargaining power of the entity established by the merger towards its consumers. It was found that on some relevant markets the **dominant position of the concentrating entities would be created or strengthened,** which would lead to a substantial distortion of competition. For this reason, the Office conditioned the approval of the concentration by commitments concerning all activities[5] of the merging entities, especially the IP rights and production and selling the selected medicaments to third persons independent on the parties in the ownership, financial and personal sense.

The decision also contained the commitments of the acquirer **to refrain from competition** in relation to the object of the IP transfers. The party to the proceeding also committed itself to exert all the effort to **terminate the licence contract** for production and sale of the Tramal medicament, concluded by the Grünenthal Gmbh company and that the contract would not be renewed in the future.

[5] Assets related to production and trade, current stock of products, all intellectual property rights to medicaments, and trade marks, further to contractual and other documents relating to the medicaments, as well as registration documents.

The Office concluded in its decision that the increase in financial power of the merging entities will enable investing more funds to research and development, which would lead both to development of generic substitutes of the original medicaments and also to strengthening the research and development of original medicaments. The concentration also eliminated duplication of development of highly profitable medicaments and the merged entities could spend the saved financial means on development of generic medicaments that would otherwise have not been developed.

- ***Case study -*** General ***Electric Company / AGFA-Gevaert AG***

In 2003 the Office approved concentration between companies General Electric Company / AGFA-Gevaert AG, subject to adoption of commitments in favour of preserving effective competition by GEC. GEC committed itself to transfer its commercial activities concerning mobile ultrasonic devices for non-destructive testing, stationary UD for non-destructive testing and changers for UD, including rights, titles and shares of GEC to an acquirer independent on the merging parties in terms of ownership, finances and staff, to company Panametrics. Investments in research and development are in the area of non-destructive testing devices among essential conditions for successful business.

All the IP and know-how primarily related to commercial activities concerning the ultrasound non-destructive devices, including all **software or software licenses** had to be transferred to independent third parties. Also the Panametrics trademark was transferred on the purchaser on the basis of an exclusive free licence for unlimited period of time. The proposed commitments therefore actually changed this horizontal merger into a conglomerate merger and eliminated competition concerns.

- ***Case study - BASF Aktiengeselschaft/Bayer CropScience AG***

In case of the merger between companies BASF Aktiengeselschaft/Bayer CropScience AG the Office found approved the merger conditionally, subject to commitments consisting in selling of some effective substances to an acquirer **independent on the parties to the merger capable of maintaining and developing the object of the transfer.** Research and development played a significant part on the relevant markets, constituting an important barrier to entry of new competitors to the market, **especially with respect to the long period needed for development of a new product (five and more years), changing needs of customers and high financial demands.**

DENMARK

Introduction

In Denmark, innovation and competition are issues placed at the head of the political agenda. Accordingly, the Danish government has set up a Globalisation Council with the task of advising the Government on a strategy for Denmark in the global economy. This has led to an ambitious strategy to gear Denmark for the future.[1] The strategy, which was published in April 2006, contains 350 specific initiatives, which together entail extensive reforms of education and training programmes as well as research and entrepreneurship, and also substantial improvements in the framework conditions for growth and innovation, including entrepreneurship and innovation policy.

One of the main goals is to promote innovation through the creation of sound framework conditions for enterprises' research and development and by ensuring a stronger competition, greater openness and transparency. It is a central objective that research and development should amount to 3 per cent of GDP by 2010. Hence, competition and innovation are highly prioritized issues in Denmark. The overall aim is to prepare for further globalisation, so Denmark can continue to be among the wealthiest countries in the world and maintain a strong social cohesion.

The Danish Competition Authority (DCA) and the Danish Patent and Trademark Office (DPTO) are both very focused on the issue of promoting innovation. Accordingly, both administrations are engaged in the matter of ensuring the proper balance between the protection of intellectual property rights and competition. This has led to a series of analyses, which considers the intertwined subjects of competition, patents and innovation. At present, the administrations are working together on a project with the overall aim of improving the conditions for trading intellectual property rights (IPR). Also, the project has set out to measure the impact innovation and patents have had on Danish companies' growth.

A working group under the Danish Board of Technology has also considered the functioning of the patent system and has provided for a series of ideas and recommendations for the solutions of problems identified in a comprehensive report. [2]

The main conclusion of the report is, that "[t]he effects of the patent system are unclear. In the last two decades, most reforms were implemented without any profound knowledge or thorough analyses of the societal and/or economic impact. The working group believes that it is no longer tenable to keep shoring up the old system without producing solid evidence of the need for doing so. In particular, advancements in biotechnology and information technology place the system under pressure. On the other hand, the impact of these advancements has resulted in positive discussions about the patent system's fundamental nature."

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1 The Danish Government: Progress, Innovation and Cohesion, Strategy for Denmark in the Global Economy – summary, may 2006, http://www.globalisering.dk/multimedia/Pixi_UK_web_endelig1.pdf

2 The Danish Board of Technology (2005): "Recommendations for the patent system of the future", Report and recommendations by a working group under the Danish Board of Technology. http://tekno.dk/pdf/projekter/p05_recommendations_for_a_patent_system_of_the_future.pdf

The working group has come up with a series of recommendations on how to make the patent system more consistent with the overall aim of ensuring long run growth. Among other things, the working group suggests that a remuneration-based patent system should be developed in supplement to the system based on exclusive rights. Also, it is suggested that the criteria to evaluate whether the inventive step has been met – particularly for software patents – is made clearer. In addition, it is suggested that the compulsory license system is made more flexible and operational in order to – among other things – offset abuse of dominant position and other effects detrimental to the common good.

Thus, the balance between IPR and competition is continuously being challenged by commentators representing differing views. There is, however, a general agreement that patents play a pivotal role in encouraging innovation and competition in the long run despite the fact that patents per definition limit short-run competition in the market in which the patented technology is applied. It is argued that patents ensure that new technology is developed and spread among market participants, and it is consequently assumed that in the long run patents lead to increased competition in the existing markets due to the launch of new products and to the creation of new markets.

Accordingly, the overall benefit of the patent system is not on the agenda regardless of the fact that there is no hard evidence proving that the patent system has had a positive long run effect on competition and innovation. Rather, the discussion is focused on how to encourage innovation as much as possible within the framework of the patent system.

The recent discussion of software patents is a perfect example of the vigorous debate in Denmark. The question of patent protection of software has been going on for many years. Recently the debate concerning this question has been actualized in relation to the Commission proposal of a directive harmonizing patenting of software inventions[3]. The Danish government supported the Commission's proposal. The government did, however, stress that a directive must ensure that only technical inventions can be patented while pure software programs and business processes cannot. Also, the government underlined the importance of ensuring a sufficient inventive step and creating a reasonable access to interoperability.

In Denmark, the opinions of the interested parties were, however, divided. One group supported the Danish approach, while another group supported a much more strict approach to software patents. The latter group argued that software patents would significantly impede innovation for one thing because patents have a negative effect on the development of open source software. The development within the ICT sector often happens fast, and inventions are often cumulative, which mean that the generation of new inventions to a great extent requires access to former inventions. Hence, critics feared that a less restrictive approach to patenting software – meaning that it would be easier to obtain patents on software – would be a significant spoke in the wheel of innovation.

Thus, commentators are vigorously debating the drafting of the patent system - especially when it comes to new technological areas, where the traditional economic theories of industrial organization do not necessarily apply to enterprises' behaviour. The Danish Competition Authority (DCA) finds this ongoing debate to be both healthy and necessary to continuously ensure a proper balance between the protection of property rights and competition.

[3] Proposal for a directive of the European Parliament and of the Council on the patentability of computer-implemented inventions: COM (2002) 92 final, 2002/0047 (COD).

1. Patents and Innovation

1.1 Patent scope

In general, enterprises are innovating to obtain a certain position in the market – either on the basis of superior products, design or service. This effort to obtain a competitive advantage is very valuable to consumers. Enterprises' incentive to innovate does, however, depend on the possibility of protecting the outcome of the enterprises' endeavour through intellectual property rights.

Accordingly, on the one hand it is important that enterprises can protect their inventions through intellectual property rights. On the other hand, there is a risk that this protection becomes too extensive, e.g. if patents are defined to broad. If this is the case, the overall aim of the patent system will not be fulfilled, since an extensive protection will lead to less competition and with that less innovation in the long run.

In Denmark, there is a very strict approach as to the scope of patents. Hence, the DPTO is very careful not to issue patents that are defined too broad. Thus, there is not any noticeable debate about the proper scope of patents in Denmark. Instead, the debate has been focused around the question of patentability and the requirements of ensuring a sufficient inventive step, as described below.

1.2 Patentability

In Denmark, there is an ongoing debate about the conditions that must be fulfilled before a patent is granted. Indeed, some commentators have argued that requirements of novelty have become too moderate implying that the inventive step is too low. This view is expressed in a survey among 75 Danish Business Executives made by the Danish Board of Technology (DBT). Hence, the survey points to a general perception of patents are being issued too easily.

This view should to a certain extent be seen in the light of the recent discussion about patenting software and the analogous discussion about patenting biotechnological inventions that took place in the 1990'ies. As mentioned above, many commentators fear that patents are issued to easily within these new fields of technology.

Accordingly, the DBT has not found any hard evidence indicating that patents are being issued more easily than previously. The number of grants relative to the number of applications does not indicate that it has become easier to obtain a patent. The number of objections against patents has not risen. Nor has the relationship between R&D expenditure and the number of patents changed markedly.

As to the question of whether it should be easier to obtain a patent for breakthrough technologies as it is for obtaining a patent for incremental technologies, the DBT asserts that there is a trend towards a more lenient approach to patenting developments of new technologies at the early stages than once the technology has matured. On that basis, the DBT has recommended a more formalized procedure that relaxes the conditions for patents issued in new technology. The DPTO does, however, not necessarily agree on this arguing that the requirements of novelty and inventive step are independent of the type of technology considered. Hence, the DPTO asserts that breakthrough and incremental technology are treated equally in the patent system.

The DCA agrees on the importance of creating incentives for the development of basic or breakthrough technology – especially if this technology is crucial for further developments (as for example the development of basic laser technology). Patents can create the necessary incentives to encourage development of such basic technology. However, patents can also create an insurmountable barrier for further innovation – especially when innovation is happening rapid and in a cumulative manner as it is the

case in the ICT sector. The existence of many overlapping patents can make it difficult for competitors and new entrants to penetrate the market.

On the one hand, it is important to ensure sufficient incentives for the development of basic knowledge through the grating of patents. On the other hand, there is a risk that patents on basic knowledge can block further development if the patent owner refuses to licence its technology to third parties. Thus, DCA finds it important that all patents fulfil the conditions of novelty and inventive step in order to avoid a deadlock situation, where innovation is hampered due to many overlapping patents.

1.3 Recent changes

The most recent change that has been made is the implementation of the EU Directive on the legal protection of biotechnological inventions[4]. This has opened the way for patenting inventions concerning plants, animals and biological material on the same terms that patents are obtained in other fields. Besides that, the Danish Patent Law has been subject to some minor changes which according to the Danish Patent and Trademark Office (DPTO) have not had any significant effect on innovation.

In general, there have not been made any empirical studies showing the effect of the changes made to the patent system. This is probably due to the fact that such analyses are very difficult to carry out because of the complexity of the matter. This implies that most adjustments are made as a result of theoretical reasoning rather on the basis of empirical evidence. Consequently, it is not possible to conclude whether the proper balance between the protection of IPR and competition has yet been obtained. As mentioned above, it is simply assumed that the current design of the patent system to a large extent fulfil the overall the aim of ensuring long run innovation and competition.

1.4 Further changes

As mentioned above, there is a continuously debate about the patent system and whether the requirements to obtain patent rights should be strengthened. In one end of the spectre, some commentators have proclaimed that the patent system does not bring any social value. This is, however, not the common view. Instead, most commentators agree on the pivotal role patent system plays in encouraging innovation as mentioned above. Accordingly, the debate in Denmark mainly revolves around the question whether the current system is organized optimally or whether small adjustments could be made in order to encourage more innovation.

1.5 Coordination with patent official

Currently, the DCA is working together with the DPTO on a project with the overall aim of improving the conditions for trading IPR. One of the tasks is to carry out part of the Danish government's globalization strategy by creating better opportunities for trading IPR through the establishment of an electronic marketplace. With this marketplace the government wishes to create a transparent and efficient market for the purchase and sale of patents, brands and other rights.

In addition, the project will outline the possibilities of creating a system of "licence of rights" to complement the traditional patent system. Also, the project will consider how enforcement of IP rights can be strengthened through the creating of a defence union. At last, the project will look into the conditions for granting a compulsory licence. All these initiatives are intended to bring about more IPR trade and improve the conditions for enterprises' exercise and enforcement of their rights.

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[4] Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions: Official Journal L 213, 30/07/1998 P. 0013 – 0021.

Also, the project has set out to measure the impact innovation and patents have on enterprises' growth potential. Accordingly, an indicator system will be developed in order to measure enterprises' use of IPR and the effect IPR has on growth, employment, innovation and other key figures. For this purpose, the Statistics Denmark (SD) has also been engaged in the project.

2. Competition and innovation

2.1 Dominance and innovation

The DCA has not made sufficient observations to conclude whether dominance promotes innovation or stifles it. However, the DCA finds that competition plays an important role when it comes to innovation. This is reflected in an empirical study the DCA has made on the relationship between the level of competition and the generation of new technology.

The study relates the number of patent applications by Danish enterprises in the period 1990-99 to the enterprises' size measured by net revenue and the marked concentration measured by the Herfindahl-Hirschman index. Hence, the DCA uses the number of patent applications as an indicator of the overall level of innovation despite that innovation protected by other means – such as trademarks, copyrights or secretiveness – is not captured by this measure. Thus, the results should be treated with some caution.

First of all, this study paints an interesting picture of the connection between innovation and enterprise size. It is found that large enterprises are more active in patenting their innovations than smaller enterprises. This indicates a certain level of economics of scale in the creation of new technology.

Secondly, the study shows that enterprises experiencing a middle strong competition are the most patent active. This result is more significant for enterprises active in the manufacture industry. In the service sector, there is a tendency that innovation is being generated by smaller enterprises in less concentrated markets. Overall, the results seem to confirm the theory of the inverted U. However, the study has not considered the question of the causality. Hence, it cannot be unambiguously concluded that it is the level of competition that affects the level of patent applications and not the other way around. The study does, however, show a poor level of innovation in the most concentrated sectors. Accordingly, it is suggested that competition does play a crucial role in promoting innovation.

At present, the DCA has not had any cases in which evidence of an abuse of a dominant position with the purpose or the effect of preventing innovation was found. It cannot be precluded that a dominant enterprise's behaviour can be explained by the attempt to maintain a given technology or standard in the market by hindering the creation of new technology. The DCA has, however, not been able to prove any kind of abusive behaviour with the aim of preventing innovation.

Still, the DCA has observed that some enterprises act to hinder – or at least do not act to promote – new technology. This is the case in the Danish telecommunication sector, where the former monopoly, TDC, does nothing to unfold the new 3G technology because this technology threatens TDC's potential earnings on 2G technology and broadband. Hence, the suppliers of the new technology are finding it difficult to gain a foothold in the market. The DCA has, however, not been able to constitute an abusive of dominant position on the basis of TDC's behaviour.

2.2 Mergers and innovation

At present, there is one merger – the *FAS* joint venture – that has been approved on the basis of an alleged contribution to innovation. The foundation of the *FAS* joint venture between the three (now two) largest national newspapers in Denmark was found to contribute to innovation through the creation of a new product in a new market and was therefore approved despite concerns about the merger's

anticompetitive effect. The new product was an on-line access to news from the press. Prior to the joint venture, independent companies already supplied the market with news from the press (but not on-line). Therefore, it was hard to estimate how successful this new service would be in the market.

The concerns to competition were related to the risk of exclusivity or foreclosure if the joint venture would be very successful in the new market. As a result, the merger was approved with remedies stating that other suppliers (of news from the press) should be granted electronic access to the news from the merging parties' newspapers if the turnover of the joint venture exceeded DKK 37 million per year (which corresponds to a market share of 30%). At present, FAS (now Infomedia) has not exceeded the threshold that brings the remedies into force.

FINLAND

1. Introduction

The contribution of the Finnish Competition Authority (hereinafter FCA) to the OECD Roundtable on Competition, Patents and Innovation has two main goals. First, the challenge posed by innovative activities and outputs to competition law enforcement is considered. To date, there have only been a few cases in Finnish competition law enforcement where the innovation issue has significantly affected the decisions taken. Despite the limited national exposure to the innovation issue, the essential challenges that major competition law jurisdictions seem to face have already emerged. Second, Finland is a nation that invests significant public resources in aiding innovative activities. Public agencies that enforce innovation and technology policies and grant public aid to innovative activities increasingly face the need to assess the competitive ramifications of their policies. What is the relationship between competition and restrictive practices and between innovation and technology policy –based measures to support innovative activities? A stronger need to coordinate competition policy with technology and innovation policies is currently emerging in Finland that we discuss in our contribution, too.

We discuss all the connections of innovative activities with competition law enforcement. Our argument is that current competition law and its enforcement – in Finland as well as in other jurisdictions - is basically designed to allow innovative activities provided that they are not carried out under statically restrictive market conditions or that there is no evidence of naked restrictive practices being implemented in the disguise of innovation. In these situations, the practices tend to be banned. We argue that the challenge of competition law enforcement resides in an increasing number of cases displaying both innovative activities and serious static restrictions of competition. Can we continue to ban all these arrangements, or should we consider other ways of dealing with these kinds of situations?

Innovations, strictly speaking, refer to new products or production processes that are known at the time they are introduced. In the context of competition law and policy, innovations appear to be discussed from a wider point of view, i.e. innovations seem to cover all new products or production processes in a market regardless of whether they were strictly unknown at the time they are launched by the particular market actor. In other words, any novelty constitutes an innovation whether or not the underlying knowledge on which it is based already existed or not. In the following, we do not attempt to confine the innovation issue to previously strictly unknown novelties in the market, but argue, on the other hand, that the more strictly a market novelty constitutes an innovation in the strict sense, the more challenging competition law enforcement becomes.

The Finnish competition law currently in force, the Act on Competition Restrictions includes prohibitions identical to Articles 81 and 82 of the Treaty on European Union, in full consonance to which the national prohibitions shall be applied. In the former Act on Competition Restrictions that was in force before the new Act came into force on 1 May 2004, the corresponding prohibitions were formulated somewhat differently from Articles 81 and 82 but the prohibitions were, nevertheless, applied in accordance with these Articles.

The 2004 reform did not alter the substantive merger control test: according to Article 11 d (1529/2001) of the Act, the Market Court may, upon the proposal of the Finnish Competition Authority, prohibit or order a concentration to be dissolved or attach conditions on the implementation of a

concentration, if, as a result of it, a dominant position shall arise or be strengthened which significantly impedes competition in the Finnish markets or a substantial part thereof. Thus, the amendment of the substantive test of the EU Merger Regulation in 2004 so as to enable the Commission to prohibit concentrations "which significantly impede effective competition, in the common market or in a substantial part of it, in particular as a result of the creation or strengthening of a dominant position" has not been repeated under national competition law. For the time being, there does not seem to be a case in which the amendment of the EU substantive test by itself might have appreciably affected innovative activities.

2. Innovations and enforcement of competition law[1]

Under the current international competition law practice, it is common to require that the evidence on efficiencies in restrictive practice or concentration cases be clear and convincing, and that it benefit, at least to a reasonable degree, consumers. Should this evidence fail to be presented, the restrictive practice or concentration in question will most likely be banned. Dynamic, truly innovation-related efficiencies cannot possibly meet these evidential requirements. Likewise, under the productive conditions of the new economy, the usual yardstick of assessing the passing-on of efficiency benefits to consumers, market concentration, is subject to a particularly high risk of error due to possibility of new innovators rapidly dethroning the dominant firms on the market (Plaetsikas & Teece 2001, Stenbacka 2002).

While it is one of the most topical issues for economic research to increase our ability to diagnose innovative processes and to anticipate their outcomes, a potentially appropriate response to this challenge might be to take conditional decisions that make it possible, within a reasonable range of time, to apply *ex post* remedies, typically structural, to put an end to monopolistic practices or structures that are not intimately necessitated by any innovative outcomes (compare Brodley 1996). Conditional decisions coupled with an authority to apply *ex post* remedies would also increase the timeliness of competition policy decision-making, which is important to the success of innovative processes.

Competition authorities may be placed in a particularly challenging decision-making position if the following conditions are met:

- the parties credibly establish that they are seriously engaged in innovative activities;
- their potentially innovative activities are necessarily connected to statically restrictive circumstances;
- the economic significance of their innovative activities is likely to exceed the static losses;
- corresponding innovative outputs are highly unlikely by statically less restrictive means.

Under such circumstances, an innovations defence might make the competition authority to issue a conditional decision allowing the parties to realise the innovative potential in a reasonable range of time which would depend on the nature of the innovation. Should parties fail in their innovative activities, the competition authority would intervene against the static restrictions which it could also do if the innovation created did not absolutely require the latter.

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[1] The following general discussion on the significance of innovations in the enforcement of competition law is based on

Kyläheiko – Virtanen 2004

There is no denying that the procedure outlined above is fraught with difficulties. There is surely no perfect way of dealing with the potential challenge posed by innovations to competition law enforcement. The issue to be discussed is whether conditional decisions allowing innovative activities to proceed, coupled with *ex post* assessment and remedies, has superior welfare consequences to blocking the arrangement outright to prevent static welfare losses, and, thereby, pave way to a possibly different dynamic development path of the industry.

Competition law enforcement vis-à-vis the use of intellectual property rights based on innovation is closely related to the discussion above that focused on situations in which the parties attempt to defend their practices by prospective future innovations. Such cases govern situations in which innovations have already been completed and protected by intellectual property rights. The issue here, evidently, is whether *ex post* restrictions imposed on the use of intellectual property rights can confiscate such a high share of the innovation benefits so as to stifle future investments into innovation.

Competition law cases have traditionally concerned either counteracting artificial enlargement of the sphere of intellectual property rights out of their legal limits, or compulsory licensing as a remedy. There is no national experience of competition law enforcement on this score. Currently, it is certainly an uphill task to persuade competition authorities or courts to order compulsory licensing save in strictly exceptional circumstances. (Muris 2001; Pitofsky 2001).

Historical experience suggests that a statically oriented anti-concentration competition policy tends to lead into severe restrictions on the utilisation of intellectual property rights in many other ways, too. Since the late 1970s, rule of reason analysis has superseded the earlier *per se* prohibitions in US policy. As far as collaborative practices on innovations are concerned, current competition law and policy allows the latter, if the concentration of the relevant market - which may be product, technology or innovation markets - does not exceed limit values and the evidence contains no indication of naked restraints of competition (See e.g. Antitrust Guidelines for Collaborations among Competitors 2000). EU competition policy on the utilisation of intellectual property rights is organised along the lines of block exemptions on various types of innovation-related agreements. Relevant EU policy, too, is increasingly lenient, as one has turned away from detailed description of accepted contract clauses into explication of prohibited contract clauses. The block exemptions provide for market concentration limits below which the contracting companies are assured of taking advantage of the block exemption. Also comparable to current US federal antitrust policy, account is taken of both product and technology markets.

As far as the utilisation of intellectual property rights and collaborative practices directly involved in innovations are concerned, at least in major jurisdictions, exclusive adherence to static optimality no longer governs competition policy. Nevertheless, policy seems to pay close attention, in addition to counteracting naked restraint of competition, to allowing only those practices, the market environment of which is only moderately concentrated. In other words, attempts are made to avoid a trade-off between dynamic efficiency and potentially severe allocative inefficiency.

The significant issue to be discussed is whether the trade-off between static and dynamic efficiencies can be always avoided and whether there will be increasing difficulties to avoid it in the future. If this is the case and little progress is made on diagnosing and predicting innovative activities and outputs as important and urgent as it is, the need to envision new kinds of decisional and remedial tools to tackle the problems may arise. Thereby, a truly evolutionary workable competition norm might materialise, which, up till now, has been necessary only in a limited sense (cf. Jorde and Teece 1990).

To conclude, the increasing significance of innovations might in the end have a fundamental effect on the way competition authorities and courts enforce competition law: a shift from **ex ante** decisions to **ex post** decision-making.

3. Competition and innovation: influence of other policies

While the issue of patenting has not, to date, assumed any role in the FCA's activity vis-à-vis innovation, Finland's systematic policy of extensive public aid to innovation activities is sure to call attention to the need to coordinate technology and innovation policies with competition policy.[2] Accordingly, the FCA has recently carried out discussions with two major agencies[3] on the relationship between the respective policies, and on the way the specialised technology and innovation policy agencies should take the competitive ramifications of their policies into consideration. The FCA has stressed to these agencies why competition policy and law enforcement is no way designed to hamper innovations, including those that the very agencies have attempted to bring about by their public aid and support policies. The agencies have also observed the hasards of strong monopolistic combinations distorting or nullifying the innovative goals of their activities.

For natural reasons, it can be anticipated that coordinative consultations between the FCA and the specialised technology and innovation policy agencies continue and deepen. **T**echnology and innovation policies essentially aim at increasing the market power of the target firms. The policies are not, to be sure, aimed at creating islands of long-lasting static monopoly power in the economy. Rather, a dynamic economic process is envisaged, which sets in motion further developments of the commodities and systems of commodities through collaboration among economic actors. Such circumstances render continued innovation possible, safeguarding sustainable competitive advantages for the economic actors, the whole economy or the particular region concerned. Thus, the inherent goal of technology and innovation policies is a steady stream of dynamic efficiency benefits certain to compensate any temporary losses from static market power. Forceful competitive pressure is required in the relevant economic environment to encourage the economic actors to proceed on a dynamic path of further innovative development. Competition policy that obstructs this kind of economic progress is certainly flawed. But this would follow if the perfect competition norm would be uncompromisingly enforced. A purely static optimality-inspired competition policy would thus stand in stark contradiction with technology and innovation policies. But this a far cry from all combinations of substantial static market power necessarily resulting in fruitful dynamic efficiencies referred to above or that all such combinations of market power brought about by technology policy necessarily end up creating these dynamic efficiencies. Attempts to realise and utilise innovations through technology and innovation policy measures may merely lead to or be hampered by unilateral or contractual restrictive practices, or concentrations that indeed create substantial static inefficiency without producing essential dynamic efficiency in return. Competition policy must counteract the latter manifestations of market power but let the successfully innovative arrangements with a further dynamic potential to carry forward.

Competition policy requires an evolutionary intellectual foundation on competition that is based on a proper understanding of the competitive process, giving full credit to the role of firms and their quest for competitive advantages through superior knowledge and innovations. A proper understanding of technology and innovation policies and its results does inform competition policy-making in view of its intellectual foundations and challenges. Effective competition policy itself may actually be regarded as a prerequisite for a successful technology policy. Competition policy can inform technology and innovation policies. Technology policy-makers should be wary of arrangements that exclusively or preponderantly enable the economic actors concerned to monopolise or collude on the markets. Sensible technology and innovation policies may, on the other hand, lead to enhanced competition while failing to bring about unduly monopolistic or collusive market outcomes, promoting the very goals of competition policy.

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2 According to Statistics Finland, in 2005, R & D outlays amounted to 5.4. billion euros in Finland, 3.5. % of the GNP. Of these outlays, 1.6. billion euros were spent by government.

3 The Finnish Funding Agency for technology and Innovation (TEKES), and Finnish National Fund for Research and Development Sitra (SITRA).

Appropriate coordination between technology and innovation policies, and competition policies is *sine qua non* for the success of the former policies.

4. Reflections on market dominance and innovation

4.1 General Discussion

The FCA has not carried out any systematical investigations into the relationship of market concentration or market leadership/market dominance with innovativeness; nor are we aware of any other inquiries into this issue. It would appear, however, that there are leading or dominant firms in Finland that are strongly innovative, both as far as product innovations and process innovations are concerned. Some of these firms have extensive activities on international markets so that their position in the Finnish market might be a minor determinant of their innovative activities. At least in some cases, precisely the innovations appear to have contributed to the internationalisation of these very firms.

While it appears difficult to argue that market dominance would have a negative causal effect on innovativeness on the Finnish market, this is surely not to say that non-dominant firms or firms operating on relatively non-concentrated markets are less innovative. There is also strong evidence of small firms that have introduced successful innovations. Evidence of the results of the extensive innovation aid and support activities by the relevant government agencies discussed above, does not suggest either that successful innovations have been introduced only in concentrated markets.

In competition law enforcement, the particular economic characteristics of industries where innovation, intellectual property, and technological change play an essential role must be carefully analysed. In these *dynamically competitive industries or markets* (Evans - Schmalensee 2001; Lind - Muysert 2003) particular attention should be paid to the incentives and obstacles firms face in developing and commercialising new technologies. In such industries, dominant firms must not be permitted to abuse their market power to hold back smaller innovative rivals which would allow the dominant firms to slow down the pace of innovation, thereby artificially maintaining or even extending the dominant market position.

Often, it is the dominant firm itself that has acted and continues to act as the major innovator. If the dominant market position itself is based on innovative output, which, as a rule is the case in such industries, competition policy restraining market power naturally compresses the dominant player's post-innovation payoffs. While it is obvious that the mere build-up of artificial barriers to new competition, in excess of the proper realm of intellectual property protection, cannot be meritorious, it is likely to be an uphill task to set reasonable enforcement standards warding off both free riding on innovation and excessive impediments to new competition. Indeed, these are industries where dominance and market shares may be highly volatile, significant market power more difficult to obtain or maintain, potentially limiting the proper scope for antitrust intervention. In some industries, competition may even take the form of competition for the market rather than competition in the market.

Intellectual property rights play, in many cases, a critical role in such innovative industries. Patents, copyright, and other IPRs may lead to significant market power when there are no substitutes on the market. Under such circumstances, the competition authority may be encouraged to open up access to the protected item. Compulsory access to IPR-protected items, however, reduces the incentives to innovate and to duplicate the innovative product, service or process even if possible. Another drawback is that if access is not voluntarily granted, the amount of compensation may require detailed regulation.

As far as the connection between market dominance and innovation is concerned, competition law enforcement has few across-the-board decision rules to follow. A moderate competition policy approach

which allows temporary but duly (innovatively) earned market power but counteracts naked obstruction of competition, might have superior welfare consequences.

In implementing the prohibition on abuse of dominance, the FCA has, in practice, attempted to follow the middle-of-the-road track envisioned, intervening with competition restraints by dominant firms which prevent the development of new operating models or entry into the field. The focus of the investigations has been on the pricing of so-called bottleneck factors.

4.2 Cases on abuse of market dominance

On the Finnish telecom markets, the FCA has concentrated on restrictive practices by dominant firms which block the further innovative development of their respective market. Market entrants have, for example, accused the incumbents of engaging in discriminatory or predatory pricing. The cases have concerned bottleneck services, often the local telecom network that has been used to defend a dominant market position on a related market. In the broadband market, the FCA commenced its investigation after having received several complaints from consumers and companies on accessibility and pricing problems in the broadband data access market. The FCA has actively and successfully contributed to an equal treatment of independent service providers (ISPs) in the fast-growing broadband Internet service market and to ensure workable competition on the retail level. This is essential in view of further progress of the information society. In this way, barriers to the introduction of new innovative products or services, or those recently innovated by others onto these markets have been substantially torn down. The proposal concerning abuse of market dominance by Lännen Puhelin on these lines, made in 2004, is still pending at the Market Court[4].

The FCA case concerning abuse of a dominant market position by Suomen Numeropalvelu Ltd (Finnish Telephone Number Service, SNOY) is analogous. SNOY was a joint venture of the Fonecta Group Ltd and Finnet-Media Ltd, which maintained a national database of telephone subscriber information and reselled the information to companies offering telephone directory services. The FCA found that SNOY's conduct was ultimately an attempt to prevent the entry of competitors offering a new type of service. At the same time, SNOY's conduct slowed down the development of more user-friendly, versatile and cost-effective directory services based on new technology. Hence, SNOY's conduct contradicted the legislative aim to increase the supply and use of new kinds of telephone directory. The case is still pending at the Market Court.[5]

In the "Setec" decision (5 February 1997), the FCA found a fixed-term exclusive agreement by a dominant money-card supplier justified owing to innovation incentives. In the absence of the exclusivity arrangement, Setec would have failed to launch a new product on the market. Setec had a dominant market position with respect to the car-specific parking meter payment systems in Finland. The FCA paid attention to that the exclusive sales right condition did not enable Setec to apply unreasonable parking meter prices. The FCA, thereby, did confess the need of the company to collect sufficient revenues to cover the development costs.[6]

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4 Lännen Puhelin Oy, case No. 949/61/2002. Decision of 21 October 2004.

5 Suomen Numeropalvelu Oy, case No. 1097/61/2003. Decision of 17 May 2005.

6 Setec Oy, case No. 580/61/1995. Decision of 7 February 1997.

5. Mergers and innovation

5.1 Merger Cases Involving Innovation Aspects

Consonantly to other competition law jurisdictions, Finland has faced the innovation issue in merger control. The effects of a merger on innovation have been explicitly assessed in the Sonera/Yleisradio,Digita[7] case. In the Sonera/Yleisradio,Digita case**,** the merging parties defended the deal by referring to innovation efficiencies. The FCA did not, however, consider these efficiencies to be merger-specific. Actually, the FCA was convinced of the merger being bound to undermine innovation. The focus of the competitive assessment by the FCA and the Council was on future products to be developed. In other merger cases, for example, in the Sonera/Loimaan Seudun Puhelin[8] case, the Checkpoint Systems/Meto[9] case*,* and the VAPO/Metsäliitto[10] case, the effects on innovation were taken into account as a part of the general assessment, i.e. without clearly indicating that the merger would have resulted in negative effects on innovation. So far, the FCA has not allowed mergers which would have resulted in competition concerns but would have also contributed to innovation. The general FCA approach has been that competition concerns cannot be resolved by positive effects on innovation.[11]

5.1.1 Sonera, Yleisradio/Digita

The transaction concerned the acquisition of joint control by Sonera Oyj[12] (Sonera) of Digita Oy (Digita), the subsidiary of Yleisradio Oy, i.e. the Finnish Broadcasting Company (FBC). The FCA made a proposal to the Competition Council (subsequently Market Court) for the prohibition of the merger. The merger was finally conditionally approved by the Competition Council, but owing to these conditions, the parties, nevertheless, decided to abandon the deal.

Sonera was the largest telecommunications company in Finland, being particularly strong in mobile communications, Internet and data transmission services. Sonera had been repeatedly deemed to be in a dominant position in mobile communications services. Sonera also had a significant market position in fixed network services. Sonera offered e.g. various data transmission solutions, service platforms, and tools for content production to companies providing services to telecommunications networks; Digita provided different services related to broadcasting and telecommunications operations. It owned the terrestrial television and radio network. Digita's main lines of business were the transmission and broadcasting services of the national terrestrial television and radio network, wherein it held a monopoly position. Digita also offered program transmission services and rented surplus capacity of its transmission network for data transmission. In the context of digitalisation of the television and radio network, Digita also broadcasted other digital communications and interactive services in addition to television and radio programs. Digita also offered technical services related to transmission, such as service platforms to the producers and users of digital communications. Digita was anticipated to be the "technical service provider" and "multimedia access and service provider" of the digital television and radio. E.g. the content services and technical

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7 Sonera Oyj/Yleisradio Oy, Digita Oy, Case No. 1010/81/99. Decision of 17 April 2000.

8 Sonera Oyj/Loimaan Seudun Puhelin Oy, Case No. 1202/81/200. Decision of 3 August 2001.

9 Checkpoint Systems, Inc./Meto AG, Case No. 728/81/99. Decision of 29 December 1999.

10 Metsäliitto Osuuskunta/Vapo Oy, case No. 1021/81/2000. Decision of 9 March 2001.

11 The FCA has discussed the Sonera/Yleisaradio,Digita and Sonera/Loimaan Seudun Puhelin cases also in Finland's submission for the OECD Roundtable on Merger Review in Emerging High Innovation Markets in 2002. See OECD Roundtable on Merger Review in Emerging High Innovation Markets. Competition Committee, June 2002. DAFFE/COMP(2002)20. 24 January 2003.

12 After a subsequent merger, the company is nowadays known as TeliaSonera. Below, "Sonera" is used.

solutions of the mobile network might be brought to digital television and radio with the aid of Digita's technical services. FBC was the producer, provider and supplier of program contents. The FBC provided public broadcasting services. At the time of the merger, the FBC offered television programs on two analogical channels and it was anticipated to commence digital television services soon after the deal.

The merging parties had potential horizontal overlaps in the future markets for service systems of the digital distribution network. The markets were about to materialise, and horizontal overlaps would be manifested as the network of Digita, and, for example, the third generation mobile communication network of Sonera could have been used to transfer the same information or other data. The Digita network was anticipated to act as a significant distribution network for different types of Internet related services. As a result of the merger, Sonera's position would have been strengthened in the market for these Internet related services. In addition, Sonera had made and controlled inventions that would have increased the operability of the networks.

The FCA stated that the merger would result in the creation or strengthening of a dominant market position of Sonera and Digita in the markets of technical services for the digitalised public broadcasting network, of transmission services for the public broadcasting network, of mobile communications services, of digital network service systems, of Sonera's regional subscriber connection network services, and of Sonera's regional cable network services. As a result of the merger, the various content distribution channels and customer connections having the largest clientele would have fallen into the hands of the same group of companies. The merger would have led into Sonera's and Digita's transmission networks no longer being competing alternatives to content producers and consumers

The merger would have also provided Sonera with unique competitive advantages. Sonera would have become a supreme multi-network operator in Finland and would have obtained a permanent head start over its competitors in the development of different products and services. Additionally, Sonera would have benefited from the strong position of the FBC, Digita's joint owner, in the supply of television and radio programs. This was, in particular, the case since the digital television operations were supposed to commence in the bundle of channels owned by the FBC and since the company was the only one which at the time of the FCA's merger decision had the right to national digital radio operations in Finland.

The FCA paid attention to the fact that Digita was indispensable to the development, fitting and testing of the technical solutions and new content services of the digitalised public broadcasting network. The FCA argued that the services provided by Digita would have, as a result of the merger, not been made available to market entrants. Hence, the merger would have led into Sonera being able, assisted by Digita, to constrain the competitive possibilities of other incumbents in the digital television and radio environment. The FCA concluded that the exclusionary effects of the merger would have undermined innovation activity and competition on innovations, and would have hindered sophisticated and inexpensive network services, technical services and new content services. The merged entity would have thus have been in a position to dictate the development of the market.

The FCA's analysis of innovation was a response to the parties having defended their deal by synergy effects on innovations, enabling them to provide new routes for data transmission. The FCA did not regard the merger as strictly necessary for innovation: R&D activity did not require Sonera to have a joint control in both Digita and the distribution network. To the contrary, dynamic efficiencies would only have been gained if Digita had been able to co-operate indiscriminately with other market participants. The harmful effects were considered to be so far-reaching and long-lasting that they could not have been balanced by any claimed efficiency gains.

The Competition Council approved the merger subject to conditions. The Competition Council noted that the FCA's concerns did not relate to the current services provided by the merging parties but to those

technical solutions which would have built a 'bridge' between the markets where Digita and Sonera had operated. Future convergence would have rendered Digita and Sonera each other's competitors in a wider market for data transmission.

Thus, the merger would have resulted in the elimination of potential competition between Sonera and Digita. Sonera's integration into broadcasting could have encouraged it to apply price squeeze in the supply of transmission services to its competitors, or to create a technological block which would have prevented competitors' access to strategically essential interface for multimedia services. At any event, the merged entity would have, as a result of its lead in technological development and a its wider product portfolio, attained technical and commercial competitive advantages vis-à-vis competitors.

The Competition Council stated that substantial competitive effects emerged on the markets in which Sonera and Digita already had a dominant market position. Indeed, the future effects of a merger must have an influence on the actual markets in order to make it possible to conclude that the concentration will create or strengthen a dominant position as a result of which competition would be significantly impeded.

The parties had not proposed structural commitments, and, as a matter of fact, the Competition Council stated that structural remedies might also prove inappropriate if markets change rapidly. The commitments finally accepted by the Council consisted, among others, of the commitment to cooperate with other market players in the fields of R&D and testing concerning the coordination of technical services and solutions as well as the commitment to provide consulting services to other market players, i.e. the commitments initially proposed by the merging parties. The commitment to cooperate on R&D is typical in innovation-intensive markets, the aim of which is to provide other market players with an indiscriminate access to R&D activity. In addition, the Council imposed on Sonera an obligation to refrain from applying for a license for digital television broadcasting. Subsequently, Sonera abandoned the deal, thereby reserving the right to obtain a license.

5.1.2 Checkpoint/Meto

The proposed transaction concerned the acquisition by Checkpoint Systems, Inc (Checkpoint) of Meto AG (Meto) which was conditionally approved by the FCA in December 1999. Both Checkpoint and Meto had manufactured Electronic Article Surveillance (EAS) systems. EAS systems consisted of alarms, deactivation equipment and alarm gates. Based on the technology applied, the EAS systems could be classified into three categories: Radio Frequency (RF), Electro-Magnetic (EM) and Acousto-Magnetic (AM) systems. Different components in one system could not be replaced by another system's components. Checkpoint manufactured RF systems and Meto EM and RF systems. In addition, both companies were engaged in developing radio frequency identification (RFID) technology. In RFID, an item is tagged with a microchip.

As a result of the merger, the combined market share of Checkpoint and Meto would have been high in the Finnish EAS market. Checkpoint and Meto had a large stock of delivered EAS systems in Finland, for which they could easily sell alarms. Checkpoint was the most significant supplier of the RF systems in Finland. Checkpoint was also the most significant manufacturer of the RF labels with a very high worldwide market share which was considered to strengthen its market power in the market for EAS systems. Meto was the most significant supplier of the EM systems in Finland. It had also developed equipment used in mass logistic applications and a so-called pallet activation furthest which, according to the FCA, could provide Meto with a significant competitive advantage should source labelling be applied in the future.

The FCA considered that the merger would strengthen the market position of Checkpoint as a supplier of EAS systems for the retail sector. In addition, the FCA stated that the merging parties were active on

several markets and their know-how in the market for auto-ID could strengthen their development in the RFID. Furthermore, the FCA considered that Meto's strong position as a supplier of EM systems could strengthen the merged entity's position in source labelling if EM technology will be chosen. Meto had also developed equipment used in mass logistic applications, considered a precondition for source labelling.

In order to remedy the competition concerns identified, Checkpoint undertook, among others, to ensure that the technology of the merged entity's RF alarm gates and deactivating equipment is compatible with competitors' RF alarms. It also undertook to ensure that the technology of the merged entity's EM alarm gates and deactivating equipment is compatible with EM alarms provided in the market. To guarantee the transparency of the systems, Checkpoint undertook to provide its Finnish competitors with information on the technology of the merged entity's RF alarm gates and deactivating equipment to ensure the compatibility of their alarms with the merged entity's EAS systems. Checkpoint also undertook to provide assistance to its Finnish EAS customers who apply EM technology so that they would be able to adjust the merged entity's alarm gates and deactivating equipment to ensure the compatibility of their equipment with EM alarms in the market.

5.2 Reflections on the FCA's approach

According to the Finnish Merger Guidelines (MG), mergers must be assessed with consideration to the future development of the market. The assessment of competition for future products and the effects of a merger on innovation will therefore form a part of the general assessment of mergers, i.e. how the market will be affected and what are the consequences that could be seen in the foreseeable future. As regards the future products, the FCA's current approach is that it assesses the effects of future products by assessing them as actual products. The future products may thus increase the merged entity's market power. However, the assessment of future products is not unproblematic. The FCA recognises the inevitable uncertainties which are related e.g. to the early stages of the product development where the nature of the final product may not always be sufficiently clear. It is also difficult to establish the requisite extent of the likelihood to be demonstrated.

The FCA shares the view that mergers in innovation intensive markets may cause competition concerns. First movers might obtain a market position that allows them to dictate the future development of the market. This kind of "anticompetitive" first mover advantage removes uncertainties and weakens the dynamics of innovation, which otherwise might remove concerns about mergers on innovation-intensive markets.

In challenging innovation-related merger cases, the parties often intend to create an innovative platform, on the basis of which a plethora of services can be supplied to customers, via a multifold of channels. At the same time, the parties themselves supply such services, too. The issue is whether independent innovators will have an equal chance to offer their services on the platform vis-à-vis the parties' own services. Banning the deal may subsequently lead into a different platform, and reposition all market participants; is that going to lead into a better static/dynamic efficiency mix compared to what would have followed from the banned deal?

6. Conclusions

In this contribution, the FCA discusses its experience of the significance of innovations in competition policy and law enforcement. So far, there have been only a few national cases in which the innovation issue has markedly affected the outcome of the case. As far as competition policy is concerned, the fundamental innovation issue is, ultimately, whether it is possible in competition law enforcement to maintain and even increase innovation incentives while at the same counteracting statically suboptimal structures and conduct. Prohibitions have surely affected the nature of innovations in respective industries,

and it is the static/dynamic efficiency mix that is arguably better as a result of the decisions. If the prospective innovation appears significant and far superior to any conceivable substitute in alternative structural conditions, an inescapable trade-off arises. The ultimate question then becomes, whether different decisional tools and remedies will be required to safeguard the conceivably best static/dynamic efficiency mix. In a formal sense, the importance of innovations has long since been recognised in competition policy. It may be that in the future the full repercussions of this recognition will have to be tackled.

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FRANCE

Le droit de la concurrence et le droit de la propriété intellectuelle, qui peuvent de prime abord apparaître antagonistes, doivent être regardés en matière de développement de l'innovation comme pouvant interagir de manière positive.

Les évolutions de la jurisprudence et les réflexions des autorités de concurrence, notamment en France vont dans ce sens. Il reste cependant difficile parfois de trouver l'équilibre efficient d'un point de vue économique.

1. L'approche jurisprudentielle

Le droit de la concurrence intervient largement dans le domaine de la propriété intellectuelle (DPI). Dans la mesure où les droits de propriété intellectuelle sont par essence des droits exclusifs, ils constituent une arme dans la concurrence dont l'exercice à des fins anti-concurrentielles doit être sanctionné par les autorités de concurrence.

La jurisprudence admet aujourd'hui qu'un droit de propriété intellectuelle peut être considéré comme une facilité essentielle à laquelle s'applique la théorie correspondante et donc qu'un refus de licence de DPI s'analyse comme un abus. Dans ces conditions, l'autorité de concurrence peut imposer la licence du DPI.

Développée par la jurisprudence américaine, la théorie des facilités essentielles pose qu'une entreprise en position dominante, qui détient une infrastructure non duplicable en raison de son coût ou de la réglementation et à laquelle les entreprises présentes sur un marché aval doivent nécessairement avoir accès pour concurrencer l'entreprise dominante, doit en permettre l'accès sur des bases équitables et non discriminatoires dès lors que cet accès est possible techniquement.

Cette théorie est restée inappliquée aux produits protégés par des DPI jusqu'à l'arrêt de la CJCE C241-91 du 6 avril 1995 dit arrêt «Magill » dans lequel la Cour a considéré que les chaînes de télévision qui disposaient d'un DPI sur leur programmation abusaient de leur position dominante en refusant de fournir ces informations brutes à un éditeur.

La jurisprudence communautaire est venue préciser, dans l'arrêt IMS C418-01 du 29 avril 2004, les conditions pour que le refus d'une entreprise en position dominante titulaire d'un DPI de donner accès à un produit ou à un service puisse être qualifié d'abusif. Il faut que trois conditions cumulatives soient remplies, à savoir que ce refus fasse obstacle à l'apparition d'un produit nouveau pour lequel il existe une demande potentielle des consommateurs, qu'il soit dépourvu de justification et de nature à exclure toute concurrence sur un marché dérivé.

C'est sur la base de cette jurisprudence que le Conseil de la concurrence a, en France, accepté les engagements d'une société tendant à l'octroi d'une licence d'accès à la numérotation de son catalogue de cotation des timbres-poste, dans la mesure où cette numérotation avait valeur de norme de fait pour la cotation et le négoce des timbres et où un refus d'accès empêchait la production de tables de concordance et pouvait, compte tenu de la position dominante de cette société sur le marché des catalogues de timbres,

empêcher le développement de nouveaux catalogues de cotation (société Yvert & Tellier -décision n° 05-D-25 du 31 mai 2005).

En revanche, le Conseil de la concurrence a jugé irrecevable la plainte de Virgin Mega demandant une licence du dispositif de gestion de droits numériques d'Apple pour sa propre plate-forme de téléchargement musical, au motif qu'en l'espèce l'accès à ce dispositif n'était pas indispensable pour le développement des plateformes légales de téléchargement de musique en ligne. Le Conseil de la concurrence, sans méconnaître les inconvénients pour les consommateurs, liés à l'absence de compatibilité entre logiciels et matériels, a relevé que des situations de ce type étaient récurrentes dans les secteurs liées aux technologies de l'information, où les innovations se succèdent à un rythme élevé et que les ajustements des marchés aux innovations ne révélaient pas nécessairement des atteintes au droit de la concurrence. Il a rappelé que pour qu'un abus de domination puisse être caractérisé sur le fondement d'un refus d'accès à une ressource essentielle, il fallait notamment que l'accès à celle-ci soit indispensable (décision n°04-D-54 du 9 novembre 2004).

Les cas où l'entreprise titulaire du DPI peut être valablement contrainte de céder une licence sont donc étroitement encadrés et liés à des circonstances exceptionnelles, ce qui se justifie par la nécessité d'éviter que l'intervention de l'autorité de concurrence n'ait pour effet de décourager l'investissement dans l'innovation et donc de nuire *in fine* à l'efficacité économique.

2. La problématique du renforcement de la protection de la propriété intellectuelle dans certains secteurs : ce renforcement est-il légitime, que faut il protéger ? Exemples de débats

2.1 La protection des logiciels

Aux niveaux mondial[1], européen[2] et national[3], les logiciels sont exclus de la brevetabilité et protégés par le droit d'auteur.

Cependant la pratique américaine[4], suivie également par le Japon, et dont les entreprises dominent le secteur, s'est orientée vers le brevetage des logiciels. Sous cette influence, l'Office européen de brevets (OEB) a développé une jurisprudence de plus en plus éloignée du droit positif. Pour cette raison, deux tentatives[5] ont déjà été menées, sans succès, pour mettre en cohérence la jurisprudence et les textes.

S'agissant de modifier les conditions de la brevetabilité des logiciels, les débats se sont focalisés sur les aspects juridiques, notamment sur l'interprétation qu'il convient de donner aux concepts à partir desquels l'OEB a justifié l'évolution de sa jurisprudence, les interrogations les plus vives portant sur ce qu'il convient de qualifier de « programme en tant que tel » ou sur les critères relatifs à l'exigence de technicité.

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1 Acords ADPIC conclus en 1994 dans le cadre de l'OMC.

2 Convention de Munich conclue en 1973, portant création d'un brevet européen et de l'organisme chargé de leur validation, l'Office européen des brevets (OEB)

3 Article L.112 du Code de propriété intellectuelle.

4 Il s'agit d'une pratique relativement récente, le logiciel bénéficiant en tout état de cause de la protection par le copyright

5 Proposition de base pour la révision de la Convention sur le brevet européen du 5/06/2000

Projet de directive, du 20 février 2002, sur la brevetabilité des inventions mises en œuvre par ordinateur.

Parce qu'il s'agit de logiciel, activité qui est appelée à jouer un rôle essentiel dans la société de l'information, le débat a également pris en compte des enjeux sociétaux. La brevetabilité du logiciel tend à faire tomber dans le domaine du brevetable un savoir qui, traditionnellement, était considéré comme non-brevetable, tel que les algorithmes mathématiques, ou les méthodes intellectuelles mises en œuvre dans des activités très diverses – vente, éducation, conseil, organisation des entreprises, méthodes de traitement clinique -, qui sont de plus en plus fréquemment automatisées par des programmes d'ordinateur.

2.1.1 Les bénéfices attendus de l'extension du régime de la propriété industrielle - le brevet - à tous les logiciels

L'extension envisagée porte sur les logiciels relatifs à des techniques purement informatiques qui sont au cœur du développement des technologies de l'information (édition de logiciel, services en ligne par exemple).

En effet, nombre de logiciels sont déjà susceptibles d'être brevetés dans le cadre des textes en vigueur. Les brevets logiciels sur des inventions matérielles, développés au sein des industries traditionnelles qui remplacent progressivement les dispositifs physiques par des programmes d'ordinateur, ne constituent pas à proprement parler des brevets sur des inventions immatérielles mais des brevets sur des inventions physiques contenant du logiciel, des mathématiques ou des méthodes intellectuelles. Le droit positif actuel prévoit sans ambiguïté que ces inventions sont brevetables.

Les entreprises qui demandent la généralisation du brevet à toutes les catégories de logiciels sont principalement les majors du secteur et plus particulièrement celles appartenant à la catégorie des éditeurs de logiciels fondamentaux (systèmes d'exploitation par exemple). Ce groupe d'opérateurs est assez peu représenté en Europe.

L'harmonisation des régimes de protection des logiciels, américain et japonais d'une part, européen d'autre part, permettrait, dans le contexte de la mondialisation des marchés, de disposer d'une vaste zone au sein de laquelle s'appliqueraient les mêmes réglementations et mécanismes d'attribution des brevets. L'uniformisation des règles de protection, quelle que soit la nature de l'activité en cause - purement informatique ou informatisation de processus physiques - est également considérée comme un facteur de fluidité des marchés. De surcroît, la jurisprudence de l'OEB est désormais suffisamment éloignée de la lettre des textes pour créer une réelle confusion quant aux règles du jeu.

Le brevetage du logiciel est également réputé offrir une arme plus efficace pour lutter contre la reproduction illicite des innovations logicielles, les recours en contrefaçons étant plus faciles à mettre en œuvre que les poursuites pour piratage.

Enfin, les défenseurs du brevet appliqué au logiciel font valoir qu'à la différence du droit d'auteur, il est pris en considération dans l'évaluation des potentialités des entreprises et faciliterait l'accès des PME à des sources de financement, notamment auprès des fonds de capital-risque.

2.1.2 L'attribution de ces monopoles a un coût pour la société, et les bénéfices attendus doivent être relativisés

Conçu initialement comme mesure d'accompagnement d'une économie fondée sur la production de biens matériels ou l'élaboration de procédés matériels, le brevet confère un monopole temporaire sur la production d'un bien ou l'exploitation d'un procédé innovant. La perspective de l'appropriation exclusive des revenus générés par l'innovation est réputée récompenser la recherche et offrir un retour légitime sur investissement. En contrepartie, l'inventeur est soumis à deux obligations par lesquelles la société peut trouver également un avantage : la publication qui garantit la diffusion des connaissances et l'industrialisation de l'invention brevetée.

Dans la pratique, comme tout monopole, le brevet réduit la concurrence. De plus, en étant un frein à la libre utilisation des connaissances, le brevet peut freiner d'autres innovations.

Recherché pour les monopoles qu'il permet de constituer, le brevet a pour corollaire un accroissement de l'insécurité juridique, qui peut aller jusqu'à des pratiques délibérées d'attaques en contrefaçons, même injustifiées, destinées à déstabiliser un concurrent.

C'est pourquoi il convient de relativiser l'avantage que les PME, notamment, pourraient retirer du régime du brevet logiciel. Si l'existence d'une protection peut leur faciliter l'accès à certains financements, ces sociétés souffriront toujours d'un net désavantage face à des grandes entreprises qui gèrent un portefeuille de brevets comme leurs autres actifs.

Les coûts induits par un contentieux en contrefaçon sont importants et pourraient, dans bien des cas, compromettre la survie de l'entreprise mise en cause.

Il a, par ailleurs, été relevé que la dynamique des start-ups américaines dans le domaine du logiciel, notamment pendant la période d'explosion de « la nouvelle économie », s'est faite en l'absence de brevets et avec un large soutien des fonds de capital-risque.

2.1.3 Ce régime ignore la spécificité du logiciel.

La répartition des coûts engagés pour la mise au point et la diffusion de nouveaux logiciels est notablement différente. Les investissements en R& D sont le plus souvent considérables, même si la créativité de petites structures reste toujours possible. En revanche, cette industrie ne supporte pas les immobilisations importantes constituées par les infrastructures de production traditionnelles.

Un logiciel possède en moyenne une durée de vie commerciale de l'ordre de 18 mois, alors que le temps nécessaire pour l'obtention d'un brevet peut atteindre plusieurs années. Au demeurant, la diffusion très rapide des produits nouveaux, comme la forte réactivité des acteurs de ce marché à l'innovation conduisent à un amortissement des investissements en un temps également très bref.

Ainsi, l'outil paraît peu adapté au secteur.

Toutefois, le problème majeur qui résulterait du brevetage des logiciels tient à la spécificité de l'évolution de la connaissance dans ce domaine. En matière de logiciel, chaque innovation s'appuie sur la précédente. Breveter l'une d'entre elles reviendrait à s'approprier un pan entier de l'industrie et à bloquer l'émergence de concurrents.

Certes, les brevets peuvent faire l'objet de licences. Cependant, dans ce cas, l'amélioration potentielle de la concurrence est notablement diminuée par l'addition des coûts d'accès à certaines données indispensables à la manifestation de nouvelles innovations.

C'est pourquoi, il convient de souligner que les craintes suscitées par l'impact probable de la soumission de l'industrie du logiciel au droit du brevet ne se limitent pas au secteur du logiciel open source. La sensibilité particulière de ce mode de production de logiciel à la brevetablilité du logiciel s'explique par le fait que leurs sources étant publiées, ils seraient plus vulnérables à des accusations de contrefaçons.

Mais la menace pèserait sur l'ensemble du secteur en raison du caractère séquentiel de l'innovation qui le caractérise.

Ainsi les intégrateurs, qui représentent une part importante de l'industrie du logiciel en France, devraient compter plus encore qu'aujourd'hui avec les éditeurs et détenteurs de brevets, ce qui entraverait l'évolution qui tend à faire d'eux l'arbitre entre le client et les fournisseurs de logiciels fondamentaux.

Les éditeurs finaux seraient également obligés de compter avec les brevets existant en amont sur des couches plus basses. Les industriels, qui substituent de plus en plus des programmes d'ordinateur aux processus de contrôles physiques, seraient confrontés aux mêmes contraintes.

Or, ces contraintes se traduiraient par des surcoûts tant en amont, en matière de recherche d'antériorité, qu'au stade de la production pour le financement des nombreuses licences nécessaires ou la constitution de provisions pour risques juridiques.

Ces charges nouvelles pourraient freiner le développement du secteur par l'entrée de nouveaux acteurs, qui, malgré un accès peut-être facilité aux capitaux, seraient désavantagés par rapport aux grands acteurs déjà établis pour lesquels une généralisation des brevets représenterait une évolution positive.

A ces éléments d'appréciation, il convient d'ajouter qu'il existe peu d'études économiques permettant d'évaluer les avantages comparés des deux systèmes. Or, il ressort des éléments d'appréciation théoriques que, compte tenu de la structure de l'industrie du logiciel en France, mais également en Europe, l'adoption du brevet logiciel emporterait plutôt des surcoûts - voire une insécurité juridique sévère - pour la plupart des acteurs les plus dynamiques, sans garantir de meilleures opportunités de développement pour le tissu des PME qui forme le socle de cette profession.

2.2 La protection des séquences géniques

Tout d'abord, la question de la brevetabilité des séquences géniques est un sujet dont les enjeux économiques, éthiques et environnementaux dépassent largement le strict cadre d'une éventuelle régulation concurrentielle des droits de propriété intellectuelle.

On peut s'interroger en effet sur la nécessité de breveter un gène, comme c'est le cas aux États-Unis. Un gène n'est pas inventé par le chercheur, il est découvert et enregistré. Aujourd'hui, isoler et caractériser un gène n'est pas particulièrement coûteux et nécessite un investissement en R&D moindre que celui nécessaire à une innovation technologique.

Du point de vue de la concurrence en outre, un gène n'a par définition pas de substitut et tout brevet octroyé à un découvreur de gène confèrerait à ce dernier un monopole incontournable dont il pourrait user pour des développements ultérieurs. Dans ces conditions, et dans l'hypothèse d'une brevetabilité des séquences géniques, il conviendrait de faciliter les licences de brevets afin d'assurer une diffusion optimale de l'innovation. Cela pourrait passer également par des licences obligatoires qui seraient décidées par une autorité de concurrence s'il était démontré qu'un gène constitue une facilité essentielle pour développer une activité en aval liée à la séquence génique (élaboration de diagnostics, de thérapies géniques ou production de médicaments).

2.3 la protection des méthodes commerciales

La question de la brevetabilité des méthodes commerciales est d'une autre nature. Selon la définition couramment retenue, les méthodes commerciales incluent « *non seulement les méthodes utilisées dans les contacts directs entre une entreprise et ses clients, mais également toutes les méthodes qui permettent à une entreprise de fonctionner, tant en interne que dans les rapports avec ses fournisseurs ou les différentes administrations* ». Alors qu'elles sont brevetables aux États-Unis (du fait du développement du commerce en ligne), elles sont exclues du champ de la brevetabilité par le code de la propriété intellectuelle. Les

brevets américains concernent des paniers d'achat électroniques, des systèmes de paiement en ligne par carte de crédits ou des systèmes de gestion des données confidentielles sur un réseau informatique.

Du point de vue de la concurrence, une brevetabilité des méthodes commerciales ne paraît pas s'imposer dans la mesure où il ne semble pas indispensable d'assurer une protection susceptible de conférer aux entreprises créatrices un pouvoir de monopole sur des méthodes dont une large diffusion serait plus efficace en termes d'optimum économique.

3. La mise en place de pools de brevets peut-elle favoriser l'innovation sans pour autant porter atteinte à la concurrence ?

Les pools de brevets mettent en commun les innovations de plusieurs entreprises à des fins de commercialisation commune des brevets regroupés. Les pools de brevets, qui sont très anciens, existent sous de nombreuses formes : en règle générale, le pool commercialise l'ensemble des brevets à un prix déterminé à l'avance entre les membres du pool ou ajusté par accord mutuel entre les membres du pool. Parfois les acquéreurs potentiels peuvent acquérir une partie des licences à un prix plus faible. Dans certains cas, les propriétaires de brevets gardent la possibilité de négocier individuellement des licences relatives à leur propre innovation.

Le principal avantage des pools est de permettre aux utilisateurs des innovations complémentaires d'obtenir les licences à un prix plus raisonnable en évitant la multiplication des coûts de transaction liés à la prolifération des demandes de licences.

Sur le plan de la concurrence, si les pools offrent des avantages en termes d'efficacité économique, il est aussi nécessaire d'établir des garde-fous. Tout d'abord les pools ne doivent pas permettre de constituer des ententes déguisées portant sur le niveau des prix, les quantités ou la répartition des marchés en aval. Il faut aussi éviter qu'ils permettent à leurs membres d'éliminer la concurrence entre eux pour l'innovation – par exemple par une rétrocession automatique au pool des brevets à venir qui réduirait l'incitation à innover. Enfin, les brevets mis en commun doivent être complémentaires : si le pool met en commun des brevets substituables (et donc potentiellement concurrents), ce pourrait être également un moyen de cartelliser le secteur.

Les pools de brevets ne sont pas couverts par le Règlement d'exemption européen n° 772/2004 sur l'application de l'article 81 aux accords de transferts de technologie. Ils ne sont envisagés que dans les lignes directrices afférentes à ce Règlement (§210 à 235).

Sur le plan des risques pour la concurrence, la Commission européenne distingue les pools de brevets substituables des pools de brevets complémentaires. S'agissant des premiers, elles considère que le pool équivaut à un accord de fixation de prix entre concurrents et donc une violation de l'article 81 du traité. Et il ne suffit pas selon elle que les parties demeurent libres de concéder des licences de manière indépendante puisque le regroupement leur permet justement d'exercer un pouvoir de marché qui serait sapé par des licences individuelles.

Pour les seconds, le risque est celui de l'exclusion potentielle de technologies de tiers. Dès lors, la Commission européenne estime que l'accord risque d'être contraire à l'article 81 du traité dès lors que les parties à l'accord détiennent des parts de marché importantes sur l'un des marchés en cause. Dans le cadre de l'appréciation individuelle qu'elle entend mener sur ce type d'accord, la Commission tient compte de la part de marché des parties à l'accord de pool. Quand celle-ci est élevée, les redevances et autres éléments de l'accord doivent être équitables et non discriminatoires et les licences doivent être non exclusives, afin d'éviter tout effet de verrouillage à l'aval.

Dans ce cas également, la Commission considère que les membres du pool doivent pouvoir concéder des licences en-dehors du pool. Si des obligations de rétrocession pour les brevets à venir sont prévues, elles doivent être non exclusives et limitées aux développements indispensables ou importants pour l'utilisation des technologies regroupées.

4. La problématique de la gestion des droits d'auteurs et droits voisins.

La question de la gestion des droits d'auteurs et droits voisins pose de manière récurrente, et sans doute de manière plus aiguë aujourd'hui à l'ère d'Internet, le problème du choix d'une gestion collective des droits et donc de celui des monopoles des sociétés de gestion et des relations qu'elles peuvent entretenir entre elles. Les affaires qu'a pu avoir à connaître le droit de la concurrence montrent que la conciliation des impératifs d'efficacité et de praticité pour les utilisateurs et de préservation de la création et de la diversité culturelle pour les ayants droits peut poser des difficultés. S'ils ont chacun leur propre logique de création et d'innovation, auteurs et utilisateurs doivent reconnaître qu'ils sont cependant interdépendants et qu'il est nécessaire de rechercher le meilleur équilibre. C'est à ce point d'équilibre que se rejoignent le droit de la concurrence et celui de la propriété intellectuelle.

Les monopoles de fait détenus par les SPRD (société de perception et de répartition des droits) sur des marchés de la gestion de droits ont été reconnus à plusieurs reprises en France par le Conseil de la concurrence (décisions n° 89-D-24, 92-D-57, 95-D-06, 00-D-40 et 01-D-26). Ce dernier a ainsi notamment estimé que « la SACEM [Société des auteurs, compositeurs de musique] est le seul organisme existant en France pour gérer les droits d'auteurs musicaux et qui soit doté de moyens nécessaires, tant à leur perception sur le territoire qu'à leur répartition entre les ayants-droits, la SACEM dispose d'une position dominante et même d'un monopole de fait sur le marché français de l'exploitation des droits d'auteur, compositeurs, et éditeurs de musique » (décision n° 00-D-40).

La segmentation de la gestion collective est liée à des raisons historiques. Si les premières sociétés de gestion collective se sont créées autour de catégories d'œuvres (théâtrales ou lyriques, musicales), d'autres critères de différenciation sont apparus (selon les modes de diffusion, les types de droits ou les catégories d'ayants droits), de nouvelles SPRD prenant en charge l'un de ces secteurs.

L'exercice de l'activité d'intermédiaire sous forme de monopole peut se justifier par la nécessité de rendre plus équilibrées les puissances de marché dans la négociation des droits mais également par la facilité d'accès au répertoire offerte aux utilisateurs.

Ainsi, pour les ayants droits, la gestion collective peut faciliter la négociation avec des utilisateurs qui disposent d'une puissance d'achat importante et leur assure également une meilleure perception de leurs droits grâce aux moyens matériels et techniques dont disposent les SPRD pour contrôler l'ensemble des modes d'exploitation des œuvres. En outre, les SPRD assurent la défense de leurs intérêts et de leurs droits au niveau national et international (elles peuvent notamment ester en justice) et conduisent des actions d'intérêt général au profit de leurs membres.

Du côté des utilisateurs, la gestion collective par la centralisation des informations qu'elle permet peut faciliter l'identification des ayants droits et la négociation de l'utilisation des œuvres (via des contrats cadres ou des redevances forfaitaires). Elle permet également une facilité d'accès à la quasi-totalité des répertoires, en l'absence de laquelle on pourrait craindre une moindre utilisation des répertoires ou une plus grande sélectivité qui ne serait pas forcément favorable à l'effort d'innovation des utilisateurs et donc à la concurrence et au marché. Des effets négatifs pour la création et la diversité culturelle pourraient également en être attendus.

Le droit de la concurrence doit veiller à ce que ces sociétés en monopole n'abusent pas de leur situation ; à cet égard la question de la territorialité de la gestion des droits est importante. Pour l'heure, une entente anticoncurrentielle entre sociétés européennes visant à empêcher l'implantation de SPRD étrangères sur le territoire national n'a pour l'instant jamais été démontrée par les autorités de concurrence nationales et communautaires. L'exclusivité territoriale instaurée par les SPRD pouvait en effet se justifier par la nécessité d'une proximité géographique pour surveiller les utilisations des œuvres sur le territoire. Toutefois, avec le développement des nouvelles technologies, cette justification est remise en cause, la présence physique étant devenue moins nécessaire pour surveiller les modes d'exploitation. La Commission européenne dans une décision du 12 août 2002 a ainsi estimé que « le progrès technique dans le domaine numérique et les nouveaux modes de communication et de consommation de la musique, comme Internet, permettent de surmonter les difficultés réelles de gestion individuelle qui faisaient craindre dans le passé que l'auteur qui entre dans un mode de gestion individuel ne puisse pas réellement l'assumer autrement qu'en cédant ses droits à un tiers » (affaire COMP/C2/37.219 Banghalter & Homem Christo/SACEM).

La Commission européenne est désormais très attentive aux accords de réciprocité signés entre SPRD pour représenter l'intégralité du répertoire mondial protégé. Depuis 2000, les SPRD ont mis au point des accords (Santiago pour le droit d'exécution publique, Barcelone pour le droit de reproduction mécanique) permettant l'obtention, auprès d'une seule société, de licences paneuropéennes pour le répertoire mondial. Ces accords ont été notifiés à la DG Concurrence qui a exprimé des doutes concernant la compatibilité de la clause de « résidence économique » (le fournisseur de service en ligne doit obtenir la licence auprès de la société d'auteur de son pays de résidence économique) avec le droit de la concurrence. Les sociétés d'auteurs ont donc décidé de ne pas renouveler en 2005 ces accords.

En avril 2004, la Commission européenne a présenté une communication sur la gestion des droits d'auteur et droits voisins au sein du marché intérieur. Elle y concluait qu'une initiative législative communautaire était fortement souhaitable en la matière et lançait une consultation sur le sujet.

En juillet 2005, la Commission a ensuite publié une étude plus ciblée sur les modalités d'octroi des licences d'utilisation des œuvres musicales sur internet, dans laquelle elle estimait que l'organisation actuelle de la gestion collective transfrontière des droits d'auteur musicaux empêche le développement d'offres légales de téléchargement. Pour améliorer l'octroi de licences de musique en ligne, trois options étaient proposées :

1. ne rien faire ;

2. améliorer la coopération entre les SPRD en permettant à chacune d'entre elles dans l'UE d'accorder une licence communautaire couvrant les répertoires des autres sociétés ;

3. donner aux titulaires de droits le choix de désigner un gestionnaire collectif de droits pour l'exploitation en ligne de leurs œuvres musicales dans l'ensemble de l'UE (concession directe de licences au niveau communautaire).

Les parties intéressées (titulaires de droits, sociétés de gestion des droits et utilisateurs commerciaux) ont été consultées sur ces trois options au cours de l'été 2005. Une majorité d'entre elles a écarté l'option 1. Les avis étaient partagés entre les options 2 et 3, les utilisateurs commerciaux manifestant leur préférence pour l'option 2, la plupart des gestionnaires collectifs de droits étant en faveur de versions modifiées de l'option 2, et la communauté des éditeurs de musique, les labels de disques indépendants et certains gestionnaires collectifs de droits privilégiant l'option 3.

A la suite de ces consultations, la Commission a adopté le 12 octobre 2005 une recommandation sur la gestion des droits en ligne en matière d'œuvres musicales. Elle propose, conformément à l'option 3 que les titulaires de droits et les utilisateurs commerciaux des œuvres protégées par des droits d'auteur aient la possibilité de choisir les modalités de concession de licences qui leur conviennent le mieux. Elle recommande ainsi l'élimination des restrictions territoriales et des dispositions concernant l'attribution des clients dans les contrats de licence existants, tout en laissant aux titulaires de droits qui ne souhaitent pas utiliser ces contrats la possibilité de proposer leur répertoire pour une concession directe de licences au niveau communautaire (option 3). La recommandation comprend également des dispositions sur la gouvernance, la transparence, la résolution des litiges et la responsabilité des gestionnaires collectifs de droits.

Cette recommandation fait l'objet de vastes débats ; elle est ainsi contestée par le Groupement Européen des Sociétés d'Auteurs et Compositeurs (GESAC) qui considère que l'option retenue, en incitant à la mise en place de grands pôles de gestion européens, présente différents risques (déséquilibre entre ayants droits au profit des grands éditeurs, désorganisation de la gestion collective des droits dans l'UE, augmentation des coûts de gestion des sociétés d'auteurs auxquelles la gestion des droits Internet sera retirée et affaiblissement du soutien aux répertoires nationaux).

Si, ainsi que le recommande la Commission européenne, il pourrait être utile d'harmoniser au niveau communautaire certaines procédures afin d'accroître la transparence et la bonne gouvernance dans le secteur de la gestion collective, tous les avantages et les inconvénients des changements proposés doivent être bien pesés et certains effets pervers au regard du droit de la concurrence doivent être évités. Ainsi, l'harmonisation ne doit pas avoir pour effet d'introduire indirectement un mécanisme de prix minimum imposé clairement proscrit par les règles de concurrence. La réflexion doit également prendre en compte les objectifs du droit de la propriété intellectuelle de protection des ayants droits et, au delà, de la création et de la diversité culturelle.

5. Les contradictions entre la protection des innovations et la solvabilisation par la collectivité

Dans le domaine de la santé, il est nécessaire de concilier deux impératifs : encourager l'innovation en assurant aux produits innovants une protection suffisante, et maîtriser les dépenses de santé en encourageant notamment le recours aux médicaments génériques.

5.1 Un régime de propriété industrielle très protecteur

Si le progrès scientifique participe à l'amélioration de la santé publique, il impose aux laboratoires pharmaceutiques des investissements en recherche et développement. Aussi la réglementation confère-t-elle aux inventeurs de molécules innovantes un monopole d'exploitation sur les médicaments, leurs procédés de fabrication et leurs formes et formulations galéniques. Cette protection est de 20 ans à compter de la demande de brevet. Or l'autorisation de mise sur le marché (AMM), nécessaire pour commercialiser un médicament intervient entre 8 et 10 ans après l'obtention du brevet, ce qui réduit d'autant l'exclusivité rattachée à la molécule nouvelle. La réglementation communautaire accorde donc aux médicaments innovants le bénéfice d'un certificat complémentaire de protection (CCP), qui peut prolonger de 5 ans au maximum la durée effective de protection.

Ce n'est qu'au terme de ces périodes de protection que des médicaments génériques peuvent être commercialisés.

Dès leur commercialisation, les médicaments génériques prennent des parts de marché importantes. En effet, la substitution du princeps par un générique est favorisée par la réglementation.

5.2 Les brevets comme moyen de contrer l'arrivée des génériques

Les laboratoires ont développé un grand nombre de stratégies pour tenter de prévenir les pertes liées à la concurrence des génériques. Ces stratégies visent le plus souvent à accroître les durées de protection par les brevets, à retarder la mise sur le marché des génériques ou encore à entraver leur diffusion.

La Commission européenne a eu récemment l'occasion d'examiner deux de ces stratégies : la déclaration de faux brevets et la diversification de gamme.

En 1999, deux fabricants de génériques ont saisi la Commission européenne, d'un abus de position dominante d'Astra Zénéca sur le marché de l'oméprazole (antiulcéreux). Leur principal argument est qu'Astra les a empêchés d'introduire, sur différents marchés européens des versions génériques du Losec (Autriche, Belgique, Danemark, Finlande, Allemagne, Pays-Bas et Royaume Uni).

L'enquête communautaire démontre qu'Astra Zénéca a mis en place une double stratégie afin d'empêcher ou de retarder l'arrivée de produits génériques.

Tout d'abord, Astra Zénéca obtient un certificat complémentaire de protection. Mais l'oméprazole a obtenu sa première 1ère AMM européenne en 1987, en France. Cette date ne permettant pas à Astra Zénéca d'obtenir de certificat complémentaire de protection dans certains pays européens, le laboratoire décide de faire disparaître cette première date pour la remplacer par une date ultérieure correspondant à l'inscription sur la liste des spécialités pharmaceutiques admises à la vente dans le Grand-Duché de Luxembourg. Cette politique de falsification de date est poursuivie de1993 à 2000, afin d'empêcher l'entrée sur le marché des génériques.

Parallèlement, les droits de propriété intellectuelle sur l'oméprazole arrivant à leur terme, Astra Zénéca va retirer la forme gélule du marché dans plusieurs pays de l'Union Européenne et la remplacer par des comprimés, pour lesquels l'entreprise obtient un brevet. Ceci a pour effet de retarder l'accès au marché des génériques du Losec.

Depuis, la réglementation communautaire a évolué, interdisant de protéger, par un brevet, une nouvelle forme galénique.

5.3 La réponse française à la multiplication des brevets.

Les laboratoires pharmaceutiques ont développé de nouvelles stratégies pour s'opposer aux génériques, notamment la commercialisation de l'énantiomère actif lorsque le médicament initial était un racémique. C'est le cas, par exemple du médicament antiulcéreux Inexium (esomeprazole) qui remplace Mopral (omeprazole) ou du produit contre les allergies Aerius (desloratadine) qui remplace Clarityne (loratadine) ; et la commercialisation d'associations fixes contenant la molécule dont le brevet arrive à échéance.

Ces stratégies permettent de détourner une partie de la prescription vers des produits encore sous brevet. En effet, s'il peut s'avérer, notamment lorsqu'il s'agit de molécules dérivées de la molécule originale, que le nouveau produit présente une plus grande efficacité et prend « naturellement » la place de l'ancien produit, on constate tel n'est pas toujours le cas, les laboratoires mènent des campagnes très importantes de promotion de ces nouveautés avant l'expiration du brevet de la spécialité initiale afin qu'elles supplantent cette dernière dans les prescriptions ou les habitudes de consommation.

Pour éviter que ces comportements ne pénalisent les comptes sociaux, les autorités françaises tiennent compte du fait que ces produits peuvent correspondre à une stratégie cherchant à faire obstacle à la pénétration des génériques lorsqu'elles en fixent les prix.

JAPAN

1. Patents and the Antimonopoly Act

1.1 The basic functioning policy of the Antimonopoly Act

The Antimonopoly Act (hereinafter referred to as the "AMA") is not applied to conduct which is recognised as the exercising of rights under the Patent Act, etc. but is applied to conduct which restrains competition when making use of these rights. This policy is stipulated in the AMA (Section 21).

1.2 Sanctions against violations

Even conduct which makes use of patent rights, etc. is subject to criminal punishment if it is a criminal violation of the AMA. In addition, in the case of a criminal violation of the AMA through the exercising of patent rights, the court may pronounce the revocation of these rights as an additional sanction (Section 100). However, this provision has never yet been applied.

2. Competition and innovation

2.1 A study on competition and innovation by the JFTC Competition Policy Research Center

In the Japan Fair Trade Commission (hereinafter referred to as the "JFTC") Competition Policy Research Center, studies on the relationships among competition, innovation and productivity are being conducted.

Motohashi, Funakoshi and Fujihira (2005)[1] conducted a quantitative analysis of dynamic economic performances, focusing on market competition (in particular, market structure) and productivity. Based on the econometric method, the authors analyzed the relationships between market structure indexes, such as the Herfindahl index and market share fluctuation index, to determine market competition conditions and total factor productivity (hereafter referred to as the "TFP") to determine productivity.

In the analysis made in the study, the authors developed corporate data by combining the results of the "Survey on Concentration Ratios of Production and Shipment" made by the JFTC and those of the "Basic Survey of Business Structure and Activities" made by the Ministry of Economy, Trade and Industry, and examined past theoretical and empirical studies on the relationship between market competition and productivity. Then, the authors estimated the Cobb-Douglas production function at the corporate level based on this corporate data, and conducted an econometric analysis of market structure and TFP growth, focusing on the intra-company incentive structure representing the short-term effects.

In addition, since TFP growth can be interpreted as the achievement of innovation efforts, such as R&D and corporate organization reforms, in a broad sense, it is important to analyze the relationship between market competition and innovation efforts. Many empirical studies have proved the significant relationship between R&D expenses and productivity. When examining the relationship between market

[1] Motohashi, K., Funakoshi, M. and Fujihira, A. "Quantitative Analysis on Competition, Innovation and Productivity" CPRC Report 02-05, June 2005.

competition and productivity, it is important to better understand the mechanism in which market competition will contribute to TFP growth through various innovation efforts, including R&D. Therefore, in the study, the authors also conducted an analysis of the relationship between market structure and innovation indexes, including R&D expenses and patents.

As a result of the analysis, a relationship was found between static market structure indexes, including the Herfindahl index, on the one side and production and innovation efforts on the other, but no clear conclusion was obtained for variability market structure indexes, including the market share fluctuation index. A positive relationship was also found between market structure and innovation efforts if market competition was weak, and a negative relationship was found between market structure and innovation efforts if market competition was extremely strong.

2.2 A Case with an AMA violation

In July 2004, the JFTC issued a recommendation to Microsoft Corporation regarding its violation of the AMA.[2] In this recommendation, the JFTC pointed out that PC manufacturers, who were granted a license for the Windows OS through direct negotiations with Microsoft Corporation, were discouraged from developing the AV function technology due to Microsoft Corporation's acts, and that fair competition in Japan in the field of said technology had been impeded. The outline of the violation and the elimination measures recommended by the JFTC are as follows:

2.2.1 Outline of the violation

- Microsoft Corporation had a dominant position in the market of operating systems for PCs. It was important for PC manufacturers to obtain a license for the Windows OS from Microsoft Corporation in order to continue their PC business.

- Microsoft Corporation granted a license for the Windows OS by entering into an agreement which contained the licensee's covenant not to sue Microsoft Corporation, other licensees, etc. for infringement of such licensee's patents by the Windows OS (the non-assertion provision).

- Due to the non-assertion provision, even if a certain patent of a PC manufacturer, who had obtained a license for the Windows OS, was used within the Windows OS, this PC manufacturer could not file a patent infringement suit against Microsoft Corporation and other PC manufacturers.

- Thus, even if a new technology, which had been developed by a PC manufacturer, was used in the Windows OS, this PC manufacturer could not bring a case for damage compensation or an injunction for a "free ride" on this technology against Microsoft Corporation and other PC manufacturers, nor ask for royalties.

- Therefore, PC manufacturers could not collect the cost of technological development by charging royalties or by utilizing other means.

- PC manufacturers were thus discouraged from developing any new technology, especially the AV function technology on the Windows OS which has been remarkably expanding in

[2] The hearing procedure is still pending because Microsoft Corporation refused to accept the JFTC's recommendation.

recent years, resulting in the tendency to impede fair competition in the area of said technology.

2.2.2 Outline of the elimination measures

- Microsoft Corporation shall remove the non-assertion provision in the existing contracts with Japanese PC manufacturers that Microsoft Corporation's subsidiary, etc. established. (i)

- Microsoft Corporation shall remove the non-assertion provision, which survives the expiration of the contract, in the contracts with Japanese PC manufacturers that Microsoft itself concluded in the past or that Microsoft Corporation's subsidiary, etc. concluded in the past. (ii)

- Microsoft Corporation shall inform the Japanese PC manufacturers, which are licensees, of the following matters in writing:

  – The non-assertion provision mentioned in (i) and (ii) above has been eliminated from the contracts;

  – From now on, licensees of the Window OS are not to be precluded from bringing a patent infringement suit against Microsoft Corporation, other licensees, etc. when entering into a license agreement.

- From now on, whenever Microsoft licenses the Windows OS to Japanese PC manufacturers, it shall not preclude them, by concluding any agreements or by any other means, from bringing a suit against Microsoft Corporation, other licensees, etc. as a result of a patent infringement.

2.3 A case of M&A

In Japan, there are no existing M&A cases that were found obstructing innovation and prohibited by the AMA. Nor are there existing M&A cases, in spite of the fact that they had anticompetitive effects, that were allowed because they were found contributing to innovation.

In the following case published in March 2002, the JFTC indicated to the companies, which had a prior consultation with the JFTC on the proposed acquisition of stocks, that competition problems would result since technologies for manufacturing beverage vending machines would be significantly concentrated within the concerned company's subsidiary due to the acquisition.

2.3.1 Acquisition of stocks in Sanyo Electric Vending Machine Co., Ltd. by Fuji Electric Co., Ltd

- In the proposed acquisition plan, Sanyo Electric Co., Ltd. would transfer all stocks in Sanyo Electric Vending Machine Co., Ltd., a 100% subsidiary of the company, to Fuji Electric Co., Ltd. By acquiring said stocks, Fuji Electric Co., Ltd. would transform Sanyo Electric Vending Machine Co., Ltd. into its subsidiary specializing in the manufacture and development of vending machines, and would consolidate its manufacturing operations.

- It was expected that technologies for manufacturing beverage vending machines would be significantly concentrated in Fuji's subsidiary due to the proposed acquisition, and that the technological capability of the subsidiary would be significantly strengthened. It was further expected that the subsidiary would gain an advantage over its competitors in terms

of business operations and technological development in the future. Therefore, if the subsidiary refused to license its technologies to its competitors, then these competitors could not manufacture or sell vending machine with similar functions.

- For the above reasons, the JFTC pointed out a problem to the concerned companies. They replied that if a competitor asked for the grant of a license of a certain technology for which they had patents, etc., they would not reject such a request and would grant the license under reasonable conditions.

- In conclusion, the JFTC replied to the concerned companies that the acquisition of stocks would not violate any provisions of the AMA on the assumption that they would take the above-mentioned measures as well as any other necessary steps.

NETHERLANDS

1. Introduction

This paper concerns the contribution of the Netherlands to the Roundtable on Competition, Patents and Innovation, to be held on 18-19 October 2006. In this paper, we will present the Dutch view on the issue of competition, patents (or more broadly intellectual property rights, hereafter IPR's) and innovation.

As requested, we will include detailed descriptions of cases in which an assessment is made between innovation/IPR and competition/market power. Among decisions drawn up by the Netherlands Competition Authority (NMa), we found few cases in which an explicit assessment is made between the effects of (a change in) market power and innovation/IPR. Therefore, we present a more general vision on how to deal with issues of competition and intellectual property rights, and if appropriate include a competition case in which innovation or IPR are taken into account.

The outline of this paper is as follows. First, we give a short description of the Dutch Patent Law (Rijksoctrooiwet 1995), then we will present our views on the relation between competition and innovation and on IPR and competition. Finally, we will draw some conclusions.

2. Patent law in the Netherlands

In this section we will outline Dutch patent law and its practical implications for companies[1]. Dutch patent law originates in the 'Rijksoctrooiwet' which came into effect in 1910'. Following the introduction of European patents in 1978, a new Patent Act was introduced in 1995, the 'Rijksoctrooiwet 1995'. For a patent to be granted, a number of criteria need to be met. An invention must be new, involve an inventive step and must be suitable to industrial application. The main difference between the Acts of 1910 and 1995, is that under the 'Rijksoctrooiwet 1995' the Patent Centre Netherlands checks the patent applications on formal aspects only; there is no longer a check on content. In the event of a subsequent juridical procedure, the content of the patent will be formally checked.

Under the Rijksoctrooiwet 1995, it is possible to apply for a 6-year and a 20-year patent. A 6-year patent is registered 18 months after the application. An applicant of a 20-year patent should ask for a newness study within 13 months after the application date. The newness study will be finished within 6 to 9 months after which a patent may be granted. The newness study does not result in a written opinion. If the applicant does not ask for a newness study, a 6-years patent will be granted by default. On average, 1.800 20-year and 600 6-year patents are granted per year. Most patents are granted to SMEs (37%) and inventors (25%).

In an evaluation study on the Rijksoctrooiwet 1995 in 2006, the degree of satisfaction among applicants was measured. In general, the applicants proved to be satisfied with the patent law. Compared to

[1] This section is based on KPMG (2006), Evaluatie Rijksoctrooiwet 1995 – eindrapport (Evaluation Rijksoctrooiwet 1995: final report); Ministry of Economic Affaires (2001), Evaluatie Rijksoctrooiwet 1995 (Evaluation Rijksoctrooiwet 1995); Ministry of Economic Affaires (2001), Intellectueel eigendom en innovatie (Intellectual property and innovation): EIM (2006), Innovatie door octrooi-informatie (innovation by patent information).

European patents and procedures, the relatively short procedural time, the simplicity, the cost and the language are considered to be strong points of Dutch patent law. A possible disadvantage of the Dutch patent system is the lack of certainty in legal procedures. In these procedures the validity of the granted patent will be determined. This creates some uncertainty over the patents. According to experts, this especially holds for the 6-year patents and procedures should therefore should be repealed or reformed (adding a newness search). Applicants of patents, on the other hand, are satisfied on the issue of protection.[2] Overall, applicants of patents are satisfied with the possibilities to protect their inventions by patents and think that the current system provides a good mix (6-year, 20-year and European patents) between legal protection, pace of the procedures and costs.

As patent systems are intended to create an incentive to innovate, it is interesting to see how companies would proceed if a patent system were lacking. In the evaluation study, companies were asked about their innovation activities if the patent system was repealed. In the following table the results are presented for proprietors of patents. More than 75% of the respondents indicated that their expenditures on innovation would remain the same. This might question the impact of the incentive created by the patent system. It should, however, be kept in mind that the applicants for patents under the Rijksoctrooiwet 1995 are mainly Dutch inventors or SMEs (over 60%). Larger companies more often opt for a European patent.

	Proprietors of 6-year patents	Proprietors of 20-year patents
Increase	3%	3%
Remain the same	83%	76%
Decrease	11%	17%
Don't known	3%	4%
Total	100%	100%

Especially for companies in chemical industry and pharmaceutics, patents are an important incentive to innovate (Ministry of Economic Affairs, 2001). Their R&D investments are huge and patents are a means to recovering these investment costs. To other companies, patents are only one way of protecting their inventions and appropriate the economic rents. Other forms of protection (trade marks, copyrights, plant breeder's rights) present alternatives to patents. Also, secrecy is mentioned as an alternative for patents (especially for process innovations).

3. Competition and innovation

The last 10-20 years show a strong increase in the number of (empirical) studies on the relationship between competition and innovation and their contribution to productivity growth (Geroski, 1990; Nickell, 1996; Boone, 2000; Nicoletti and Scarpetta, 2003; Griffith and Harrison, 2004; Aghion, Bloom, Blundell, Griffith and Howitt 2005; Griffith, Harrison and Simpson, 2006). A large number of studies use OECD or Worldbank databases (product market regulation database, STAN database, Doing Business: benchmarking business regulation) as their main source of information on various countries.

Most studies conclude that an increase in competition contributes to economic growth and productivity. The effects are not the same for all countries, however. Nicoletti and Scarpetta (2003: 36) found that '…the long-run costs of anti-competitive regulation, in terms of foregone productivity improvements, are higher in countries that are further away from the technological frontier'.

[2] In the period 1996-2000, only two cases were pending before court.

Griffith and Harrison (2004) test the relationship between product market reforms, competition (measured by changes in mark-ups) and innovation. They find a significant positive effect between the level of mark-up and R&D. However, the relation is sensitive to outliers. In Griffith, Harrison and Simpson (2006) the scope of the analysis widens to sector level. In this analysis, they find a negative relation between the mark-up and R&D expenditures (a 1% point lower mark-up result in an increase of R&D-expenditures of 0.3%). The effect of growing competition on innovation is larger in countries that are closer to the technological frontier. Lower mark-ups (more competition) also result in more patents. This last relationship is a reaction of incumbents (in terms of companies that have applied for patent before) to increased competition.

Aghion et al (2005) presented an inverted U-shape relationship between competition and innovation. At the lower level of competition, an increase in competition results in an increase in innovation. At the higher level of competition, an increase in competition results in a decrease in innovation. R&D activities reach their peaks at a moderate level of competition.

In a theoretical paper, Boone (2000) showed that the effect of competitive pressure on a firm's incentive to innovate depends on its relative efficiency level. He distinguishes two types of innovation: product and process innovation. The incentive for product innovation is determined by the expected profit level associated with the new product. Process innovation results in a reduction in the production costs. On the basis of this model and given the characteristics of the firm, the incentive to innovate products or processes can be determined.

Tang (2006) empirically studied the effects on innovative output, generated by various drivers of competitive pressure (substitutes, entry) and the technological context. He found that an easy substitution of product is negatively correlated, while the constant arrival of new competing product is positively correlated with R&D and product innovation. Quick obsolescence of products is positively correlated with product innovation, but negatively related with process innovation. Rapid changes in production technology are positively correlated with process innovations.

It seems clear from literature that there is a relationship between the level of competition and innovation. The relationship, however, may be dependent on a large number of context issues, such as sector, country, distance to the technological frontier etc. Furthermore, relationships may differ for product versus process innovations (Boone, 2000; Tang, 2006).

In a recent study on open innovations, the Advisory Council for Science and Technology Policy identified a lack of clarity in competition policy regarding cooperation between companies within research projects. They proposed to start an open discussion between the relevant parties over this topic. Based on this advice, the Ministry of Economic Affairs will organise roundtable meetings on competition, IPR's and innovation in the near future.

At the moment, there are several research initiatives to study the relationship between competition and innovation:

- A special research program (including 5 research projects) was initiated in 2004 to study the relationship between competition and innovation. Initial results are expected in the coming years.

- The Ministry of Economic Affairs commissioned a research to study the relationship between competition and productivity growth in sectors where productivity growth is lagging behind.

Also the NMa recognises the important relationship between competition and innovation. The relation competition – innovation will be studied in more detail the coming years. However, the studies outlined

above focus on the relationship between competition and innovation on an aggregated level, i.e. involving an economy or industry in its entirety. The results do not provide detailed information on how to evaluate the relationship within specific industries and specific cases. Each case requires an individual assessment of the effects of more or less competition on the innovation incentives. The findings of the empirical studies presented above may give directions as to which factor should be taken into account. However, data provided do not give a clear answer to the question whether changes in competition in a specific case increases or decreases the incentive to innovate.

In case practice so far, the NMa has not explicitly taken innovation into account. Sometimes the hindrance of innovation or renewal is used as an argument to prohibit a merger, for instance in the Wegener Arcade/VNU Dagbladen merger.

Box 1. NMA decision and innovation

In this Box, we will describe a merger case in which renewal/innovation was one of the arguments to pose remedies to a merger. Although innovation or renewal was not the main argument, it was used to describe competitive conduct before the merger.

In 1999, Wegener Arcade N.V. announced to take over VNU Dagbladen B.V. Both companies are active on the market for regional newspapers and free local papers. Because the merger might negatively influence competition, the Director General of the NMa decided that a license was required. In this merger, there are two primary customers, readers and advertisers. As the market for readers is most interesting in the context of this paper, we will only discuss the market for readers of newspapers.

The product market is delineated as the market for regional and national newspapers, where regional newspapers (which overlap in the area of distribution) are the closest substitutes. The geographical market is delineated including several regions. As regards two regions, Gelderland-Zuid and Zeeuws-Vlaanderen, the overlap between the merging parties may give reasons for concerns. The combined market share is over 50% and therefore, there are concerns that the proposed merger would significantly reduce competition.

In the decision, the competitive conduct before the merger is described. In the relevant regions, competition between the different regional newspapers resulted in investments improving the quality of the newspaper, more regional news, changes in the form of the news paper and extra supplements. This is in line with research on the quality and variety of regional newspapers in markets with only one or more regional newspapers.

There were concerns that incentives to innovate would diminish, if the merger were to be cleared. The merger might result in a reduction of quality, less up-to-date local reporting, renewal or even a reduction in variety of regional newspapers in case titles were discontinued. The conclusion of the investigation was that the merger could significantly hamper competition in the relevant markets.

Given these doubts, the merged parties proposed remedies. For the region Gelderland-Zuid, they proposed to sell a number of regional newspapers and free local papers to a party with enough experience and financial means to be a viable competitor. This resulted in a significant decrease in market share in that region. For the Zeeuws-Vlaanderen region, the parties proposed to keep both regional newspapers but place them in separate, independent business undertakings. In this way, both regional newspapers could compete in terms of local news, form etc. All free local papers in this region were sold.

Given these remedies, the concerns about the effect of the decrease of competitive pressure on, amongst others, the renewal and quality of the regional newspapers, were addressed.

4. IPR's and competition policy

The Dutch government realises that innovation plays an important role in generating consumer benefits. "New products'" or "new ways of doing things" often lead to increased consumer welfare and have been engines of growth for individual firms, national economies and world trade. The NMa therefore believes that competition policy should not solely focus on short term price/output issues, but should also be carried out with a dynamic perspective taking due account of innovation.

The NMa also realises the important role that IPR's may play in encouraging and rewarding innovation by granting firms IPR's. The NMa therefore would only in exceptional situations – situations in which it is very clear that the competitive process itself would not suffer from intervention (for instance with regard to investment incentives) and consumers (also in the long run) will, in all likelihood, be better of – intervene with the use of IPR's.

Basically, in abuse cases the NMa will follow the case law as developed by the Court of Justice of the EC regarding 'essential facilities' and IPR's, but the NMa will be reluctant in applying this doctrine, as will be argued below. In abuse cases different from 'essential facilities problems' the NMa will put emphasis on (for example) 'exclusionary practices' or 'raising rivals' cost' that are not related to the scope of protection that the IPR provides. With regard to cartels, the NMa will follow the line of reasoning developed by the European Commission in the Horizontal Guidelines.

It should be clear that the NMa does not necessarily see a 'tension' between IPR's and competitions policy. IPR's are often associated with social losses associated with market power (for example in the form of deadweight loss). It is therefore common to speak of a 'tension' between the ex ante perspective, IPR's are essential to create incentives for innovation, and the ex post perspective, intellectual property creates social loss due to for example monopoly pricing.

Granting IPR's does not in all cases lead to significant market power. Exclusive rights would only confer market power if the claims cover a significant portion of an economically relevant market. In the context of copyrights - where copyrights only confirm rights regarding the expression of ideas fixed in a tangible medium and not the ideas themselves - individual copyright would seldom confer significant market power and does not as such prevent competitors from creating works with the same functional characteristics.

More fundamentally, it is the question whether or not it is appropriate to speak of market power related inefficiencies created by IPR's especially in cases where in the absence of these rights there would be no or little 'markets' to speak about. The point is whether or not it is appropriate to speak about for example "deadweight loss" created by intellectual property rights in cases where it is likely that in the absence of these rights no output will be produced due to the non-exclusivity problem. In such a case "deadweight loss" can never actually be part of the surplus.

These points should however not be interpreted to suggest that industries characterised by a high degree of innovation and the wide spread use of IPR's should be immune from the scrutiny of competition authorities. When for example IPR's are used strategically in order to injure competition or when the dominant companies try to extend their exploitation beyond the duration of the rights (in this case the dominant position is sustained for longer than necessary), the NMa would not hesitate to intervene.

Box 2. NMa decisions and IPR

NMa's Case No. 1, NOS/HMG vs Director-General of NMa/Telegraaf, relates largely to the degree to which a refusal to supply weekly programme listings, which are protected by intellectual property rights, may result in the abuse of a dominant position. According to the NMa , NOS (Public broadcaster) and HMG (commercial television broadcaster) had abused their dominant position by refusing to license their programme listings to De Telegraaf (newspaper publisher) and had thereby reserved the market in weekly TV guides to themselves. The NMa argued that De Telegraaf was seeking to introduce a 'new' product, which was different from the NOS/HMG's own publications. Not the antitrust regulator must decide whether the product is 'new', but the consumer. The NMa then imposed a provisional compulsory license. The Trade and Industry Appeals Tribunal, however, disagreed with the conclusions of the NMa in a ruling on 15 July 2004. According to the Tribunal, the NMa did not sufficiently motivate why a newspaper containing programme listings, as was envisaged by De Telegraaf, would qualify as a 'new product' within the meaning of the Magill doctrine.

The case of the FTC versus Rambus provides an interesting example of a case in which IPR's were used anticompetitively, but in which the subject matter was unrelated to the question of 'access to an essential facility'.

Box 3. FTC vs Rambus[3]

The Federal Trade Commission charged Rambus, Inc., based in Los Altos, California, with violating federal antitrust laws by deceiving an industry-wide standard-setting organisation, resulting in adverse effects on competition and consumers.

The standards organisation at issue - the JEDEC Solid State Technology Association - develops and issues widely adopted technical standards for a common form of computer memory known as "SDRAM." SDRAM standards are used in a wide variety of downstream products

JEDEC has implemented procedures designed to ensure that members disclose any patents, or pending patent applications, involving the standard-setting work being undertaken by the organisation.

According to the FTC's complaint, Rambus participated in JEDEC's SDRAM-related work for more than four years without ever making it known to JEDEC or its members that Rambus was actively working to develop, and did in fact possess, a patent and several pending patent applications that involved specific technologies proposed for, and ultimately adopted in, the relevant standards.

According to the FTC's complaint, Rambus's challenged conduct has caused or threatened to cause substantial harm to competition and consumers, because it has placed Rambus in a position to assert patent rights over the relevant JEDEC standards, and to obtain substantial royalties from memory manufacturers producing products in compliance with those standards.

5. Conclusion

The relation between competition, IPRs and innovation has the full attention of the Dutch government and the NMa. Several initiatives have been started to study and discuss the relationship between these concepts in more detail. It is recognised that competition law and IPR may sometimes seem to be in conflict, as the first aims to prevent the formation of monopolies or a dominant position and the latter seeks to promote innovation by granting temporary monopolies over inventions. The NMa is aware of this

[3] The text is taken from http://www.ftc.gov/opa/2002/06/rambus.htm

delicate balance between welfare enhancing innovation and welfare reducing incentives created by monopolisation, but also recognises that the main issue is not concerned with a trade off between the two phenomena as such. The main issue is related to the abuse as defined by 'exclusionary behaviour' or by behaviour that leads to 'raising rivals' cost.

Compulsory licensing for instance may seem to resolve the problems from temporary monopolies or dominant positions. In line with the essential facility doctrine, the NMa has the possibility to intervene if the monopolist or dominant firm refuses to license, but the NMa is reluctant to do so to maintain the incentive to innovate and protect the invention by patents. The NMa will intervene when behaviour extends beyond the scope of the IPR in the sense described before. This asks for a careful evaluation of each specific case.

SWITZERLAND

Introduction: Recent debate in Switzerland

Switzerland files more triadic patent applications (applications filed at the EPO, the USPTO and the Japanese Patent Office) per inhabitant than any other country in the world and its biotechnology industry is one of the strongest in Europe.[1]

In light of this success story it has become all the more apparent that the law in force is no longer apt to keep pace with new technologies. Therefore, Swiss patent law is currently being revised. A major point of the revision concerns the patentability of biotechnological inventions and the adaptation of Swiss law to the Biotechnology Directive 98/44/EC. However, the draft bill does not limit itself to the question of patentability of biotechnological inventions, but also addresses other issues such as the exhaustion of patent rights in general and the implementation of several international treaties.

From a competition policy point of view two main concerns have been raised:

- exhaustion of patent rights and parallel imports;
- the scope of protection of DNA patents: Should the scope of protection of DNA patents be absolute ("absolute protection") or limited to the concrete disclosed functions of the DNA ("function bound protection")?

Both of these very controversial issues deal with the broadness of patent scope. The public debate has been primarily driven by interest groups, and only to a lesser degree by economists. Discussions in Parliament have just started. However, the National Council recently decided to treat the question of parallel imports separately in a later stage in order to accelerate the legislation process for the less disputed parts of the revision.

In the following, we will briefly describe the background of this controversy and outline the various solutions which have been examined.

1. National, international or regional exhaustion of patent rights?

1.1 Judgement of the Swiss Supreme Court

The debate on exhaustion of patent rights was launched in 1999, when the Swiss Supreme Court ruled that national exhaustion principle applied to patents in Switzerland and therefore the patent holder Kodak could block parallel imports of patented Kodak films by a Swiss retailer coming from Great Britain[2]. Nevertheless, the Swiss Supreme Court stated that the Act on Cartels applied, when the patent holder

1 S. Thumm, Nikolaus (2003): Research and Patenting in Biotechnology - A survey in Switzerland www.ige.ch/D/archiv/a105.shtm

2 BGE 126 III 129.

abuses the exclusive rights granted to him by the patent.[3] Ever since, this ruling on the question of parallel imports is a very controversial issue that has given rise to fierce political debates.

It is worth mentioning that in other areas of intellectual property law in Switzerland, namely in trademark and copyright law, international exhaustion is applied. With the judgement of 1999, the principle of national exhaustion of patent rights was formally stated for the first time, as the Swiss Patent Law did not contain the applicable exhaustion principle for patents.[4] From an economic perspective, patent owners were granted the right to differentiate prices for patented goods and their revenue from patent rights increased compared to the alternative of international exhaustion. On the other hand, competition by parallel importers was removed for patented goods and consumers were harmed as prices remain high in Switzerland for many patented products.

1.2 Revision of the Swiss Cartel Act

As a first consequence of the Supreme Court's ruling, Parliament introduced one new rule in the Law on Cartels[5] which was at that time under revision:

> *"The present Act does not apply to effects on competition that result exclusively from laws governing intellectual property. However, import restrictions based on intellectual property rights fall to be assessed under this Act."* (Art. 3 para. 2 Acart revised).

This new provision does not introduce international exhaustion in patent law, but it enables the Swiss Competition Authorities to examine import restrictions based on intellectual property rights in order to prevent abuse of the exclusive patent rights, when an illegal vertical agreement or an abuse of a dominant position is found. In other words, the patent holder cannot object to parallel imports if the exercise of his exclusive rights constitutes an illegal anti-competitive practice according to our Cartel Act.

Up to now, there have not been any cases dealing with parallel imports involving intellectual property rights. The only pre-investigation in connection with the revised Art. 3 para. 2 ACart is about to be closed, as the patent holder decided to conclude a pan European contract with his distributors, which allows parallel imports between the EU and Switzerland. The modification of these distribution contracts was less caused by the revised Act on Cartels than by the fact that the relevant market is shrinking and thus price differentiation between countries is turning less beneficial than the efficiency gains from the pan European distribution system.

1.3 Governmental studies

In January 2000, a parliamentary commission asked the Government to prepare a report analysing the impact of parallel imports of patented goods. In its first report, the Government concluded that the impact of a change from national to international exhaustion of patent rights could not be answered based on

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3 According to the Federal Court only if the three following conditions are cumulatively fulfilled it may be considered as abusive to invoke patent legislation to bar parallel imports: The imports originate in a country of comparable income, patent protection is comparable in the country where the imports stem from, and in the country of origin prices are not regulated.

4 A former judgement, dating back to the 70s was not very conclusive ("Omo case", BGE 105 II 49).

5 Entry into force: April 1st 2004.

available data and had to be analysed more thoroughly[6]. A distinction between regulated and non (price-) regulated markets was made.

In March 2001, a parliamentary commission mandated the Government to make the respective economic analyses. For its second report, the Government commissioned three external studies. The economic study by Frontier Economics and PLAUT Economics estimated the economic benefit of a change to international exhaustion to be a one-off GDP growth effect of 0.0-0.1%[7]. In a second study, it was found that prices for pharmaceutical products – many of them are patented and thus protected from parallel imports - are high in Switzerland compared to the European level. Only a small fraction of the price differential could be explained by economic and structural factors, while the much larger part was explained by a whole set of complex regulations affecting these products[8]. A legal opinion that was commissioned by the Government in the course of the elaboration of the second study examined the feasibility of a policy change in patent law.[9] The external experts concluded that there were no specific legal barriers to the introduction of international exhaustion of patent rights, while the idea of a Europe-wide regional exhaustion would have to be dealt with in a regional agreement[10]. The Government concluded that the economic benefit of 0.0 – 0.1% of GDP was not large enough to justify a policy change considering that detrimental effects might exist as well. A major concern was that Switzerland would not give the appropriate signal by opening up its markets to parallel imports, given the fact that in international negotiations, Switzerland used to stress the need to protect intellectual property rights. At the same time, the government considered regional exhaustion of patent rights to be an option worth studying. It was announced that the issue of national/international exhaustion, specifically the question of "abuse" of national exhaustion[11], would be explicitly addressed in the forthcoming patent law revision[12].

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6 Importations parallèles et droit des brevets, Rapport du Conseil fédéral du 8 mai 2000. http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/f/000531c-ber-f.pdf

7 Frontier Economics and PLAUT (2000): Erschöpfung von Eigentumsrechten: Auswirkungen eines Systemwechsels auf die schweizerische Volkswirtschaft. http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/d/Studie_Systemwechsel_und_Anhang.pdf

8 BASYS and Infras (2002): Auswirkungen staatlicher Eingriffe auf das Preisniveau im Bereich Humanarzneimittel http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/d/Studie_Humanarzneimittel.pdf

9 See Daniel Kraus (2003): Les importations parallèles de produits brevetés: Droit de l'OMC dans la perspective du droit communautaire et du droit suisse de la propriété intellectuelle et de la concurrence, for a comprehensive analysis of the possibilities according to international law to introduce any differentiation (regarding product categories and/or countries) in either the regime of national or of international exhaustion.

10 Kraus, Joseph and Katzenberger, Paul (2002): Parallelimporte: Rechtsgrundlagen zur Erschöpfung im Patentrecht http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/d/Rechtsgutachten_Erschoepfung.pdf

11 Specifically, the issue that some producers might abuse their national exhaustion rights on patents was to be tackled. A common example for an abuse would be a company that uses a patent right of minor importance to prevent parallel imports of a product that was otherwise only protected by trademark law and hence subject to parallel imports.

12 Importations parallèles et droit des brevets, Rapport du Conseil fédéral en réponse au postulat de la CER-N (00.3612). http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/f/TRI_BERICHT_PARALLELIMPORTE_FRZ.pdf.

Consequently, the federal council was mandated by the parliament to analyse the option of regional exhaustion of patent rights more thoroughly. In its third report on parallel imports, the government concluded that the economic benefit of a switch to regional exhaustion would only be marginally lower than the one of the switch to international exhaustion. However, it was again noted that regional exhaustion was only legally possible in the context of a regional agreement with the European Union. Since it was assumed that an agreement would require Switzerland to switch to regional exhaustion also in other areas of intellectual property law, where Switzerland applies international exhaustion today, such a regional agreement was not estimated worthwhile. Eventual gains and losses of a regime switch were considered to be of comparable magnitude. Hence, the federal council proposed to insert national exhaustion in patent law and to introduce an article that prevented abuse of national exhaustion for goods that were protected by several intellectual property rights[13].

1.4 The public debate

In the public consultation procedure, the proposed codification of national exhaustion of patent rights was welcomed by business and industry associations, most prominently those representing the pharmaceutical industry. They argued that strong patent rights boosted innovation and thus contributed to welfare and growth of the Swiss economy. They noted that allowing parallel imports would mostly benefit wholesalers and only partly consumers, while the incentives for producer innovation were reduced if regional or even international exhaustion were introduced. Furthermore, they stated that many patented products, specifically pharmaceutical products, were subject to price regulation in many countries. They noted that the lower prices in many countries were not a result of competition, but a consequence of price regulation. Moreover, they argued that regional exhaustion was only feasible in regions with a uniform legal framework, such as the European Union. The associations noted that abuse was to be tackled by competition law and not by a regime change in patent law.

On the opposite side, consumer associations, the Price Surveillance Authority and the association of health insurers demanded the introduction of regional or international exhaustion of patent rights. They argued that such a policy change would be beneficial to consumers and contribute to slower growth of health insurance premia as parallel imports would allow to lower the high prices of patented pharmaceuticals in Switzerland. Furthermore, they stated that competition would not endanger, but rather boost innovation as competitive pressure would increase the need to innovate in order to generate profits.

The Competition Commission has always been in favour of international exhaustion and – as second best – regional exhaustion of patent rights – both introduced bilaterally or unilaterally [14]. It remarked among other things that such a policy change would considerably increase GDP growth, ease parallel imports and at the same time complicate foreclosure of the Swiss market. Further, in its opinion, the announcement effect of such a policy change towards the enterprises was overvalued and Switzerland as a research location not endangered, since companies chose the place of their research departments not depending on exhaustion of patents, but on other structural factors such as the availability of qualified personnel, taxes and quality of life.

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13 Importations parallèles et droit des brevets: Epuisement régional. Rapport du Conseil fédéral. http://www.evd.admin.ch/imperia/md/content/dossiers/importations_paralleles/f/rapport_final_envoi-wak_f_04-12-15.pdf.

14 recommendation concerning parallel imports and patent rights, RPW 2003/1 212 ff.; responses concerning the revision of the patent law.

1.5 Economists' views

Besides the already mentioned economic analyses that were commissioned by the federal council, several Swiss economists have commented on the issue of exhaustion and parallel imports.

Barsuglia and Weder (2006)[15] specifically looked into the pharmaceuticals sector. They remark that the pharmaceutical sector is subject to a whole set of regulations, namely patent rights, a ban on parallel imports based on health protection legislation and price regulation. While they conclude firstly that from a theoretical perspective, total welfare in Switzerland might be raised if parallel imports are allowed (i.e. gains in consumer welfare can be larger than losses in producer welfare if certain conditions are fulfilled), they also argue that a final judgement is impossible due to uncertainties on price setting in foreign markets. They note that if parallel imports were only about lowering pharmaceutical prices, a simpler tool would already be at hand with the current price regulation mechanism.

2. Absolute or function bound protection of DNA patents ?

Highly controversial, albeit not yet subject to a broader public discussion, is the question whether the scope of protection of DNA patents should be absolute or limited to specified and disclosed functions of the DNA. While traditionally the scope of patent protection for chemical compounds is absolute, it has been put into doubt whether the same conclusion can be drawn for DNA patents. As DNA are multifunctional the idea to grant patent protection also for those functions which have no connection whatsoever with the function disclosed appears to reduce the incentive for investigating the different functions of a known DNA.

Initially, the draft bill proposed a function bound protection for DNA patents. However, this proposal met with stiff resistance by the large pharmaceutical companies supported by some political parties and trade associations, while research institutes, SME and other political parties were in favour of this solution. As the issue is very technical and the delicate delimitation between pro-competitive incentives for innovation and harmful over-protection is very difficult to make, the government called upon a group of experts to give a second opinion on this issue.

The group of experts finally discussed two options: a function bound protection for DNA patents or an absolute protection which nonetheless shall insure that no speculative or excessively broad patent claims can be filed. In its report, the group voted in favour of the second option, which is now the solution presented to Parliament in the current draft of the Patent Law revision. It remains to be seen how Parliament will tackle this issue.

3. Conclusion

Although by now the debate described has been going on for years, it is difficult to predict which one of the suggested and examined solutions will finally be adopted. As an intermediate decision it was decided to postpone the debate regarding national/international exhaustion and to settle first the question of absolute or function bound protection of DNA patents. With respect to absolute/function bound protection, the final decision will most probably be primarily the result of political considerations. One reason is that the economic literature is not yet able to provide us with clear-cut advice:

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[15] See http://www.dievolkswirtschaft.ch/fr/editions/200607/Weder-Barsuglia.html or the attached document for an overview.

In a general overview of current literature, Schmutzler (2006)[16] criticizes that the traditional view of economists – the conflict between the inefficiency of the patent monopolist on the one hand and the patent right's incentive for innovation on the other hand – is too simplifying. He argues that nowadays many inventions and innovations depend on a whole set of prior patents and non-patented innovations. The complex environment leads to strategic behaviour such as strategic patenting, voluntary publication of research results, vertical and horizontal integration as well as patent pools. According to Schmutzler, the behaviour of market players depends on their estimation of the inventor's own negotiating power and the probability of the development of innovations depending on his own invention. For example, developers of open source-software renounce on any intellectual property rights on their innovations, but nevertheless develop successful business strategies. Schmutzler concludes that simple policy advice is impossible with the current know-how of economists.

[16] See http://www.dievolkswirtschaft.ch/fr/editions/200607/Schmutzler.html or the attached document for an overview.

ANNEX

Roundtable on Competition, Patents and Innovation

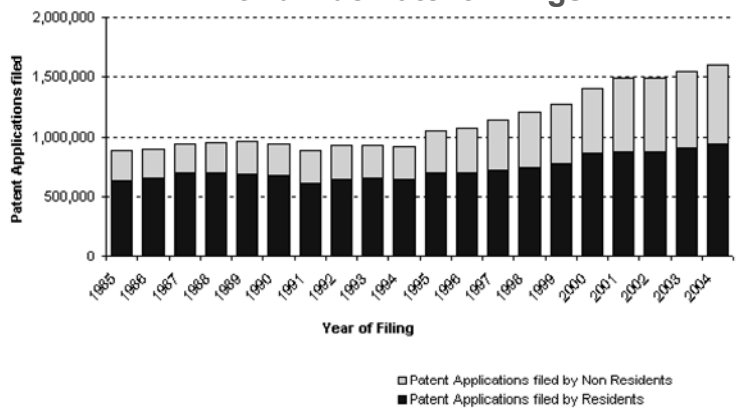
OECD
Paris, October 18-19, 2006

Competition, Patents and Innovation in the Swiss Biotechnology Industry

Nikolaus Thumm
Senior Economic Counsellor
Swiss Federal Institute of Intellectual Property

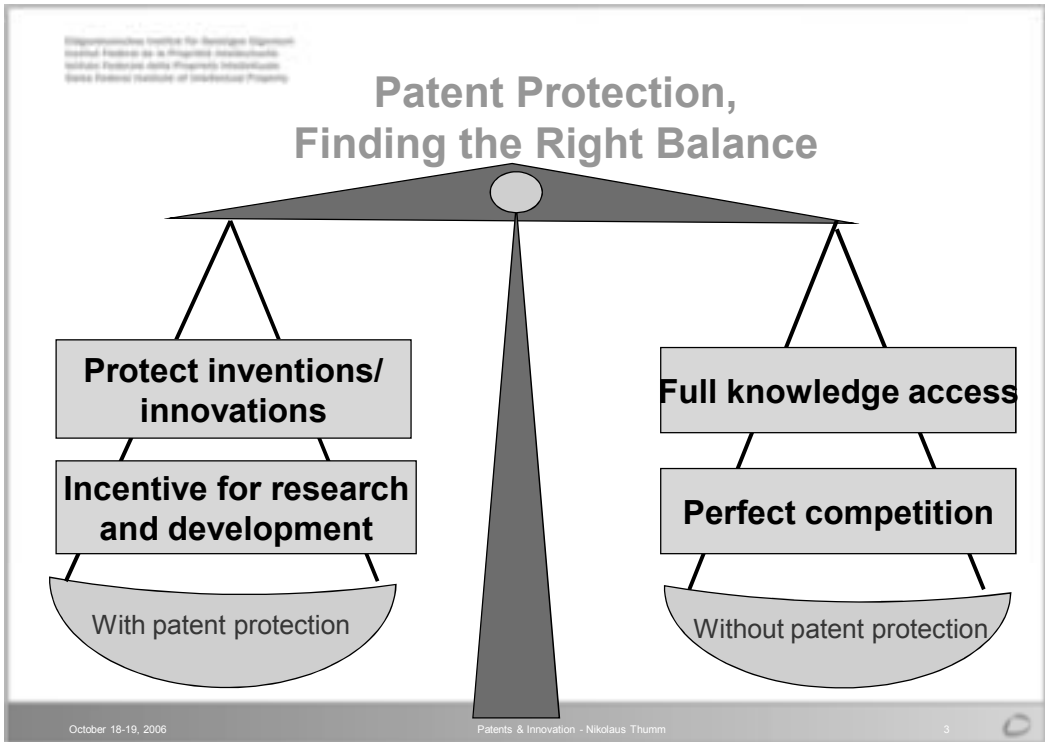
Do Patents create Innovation?

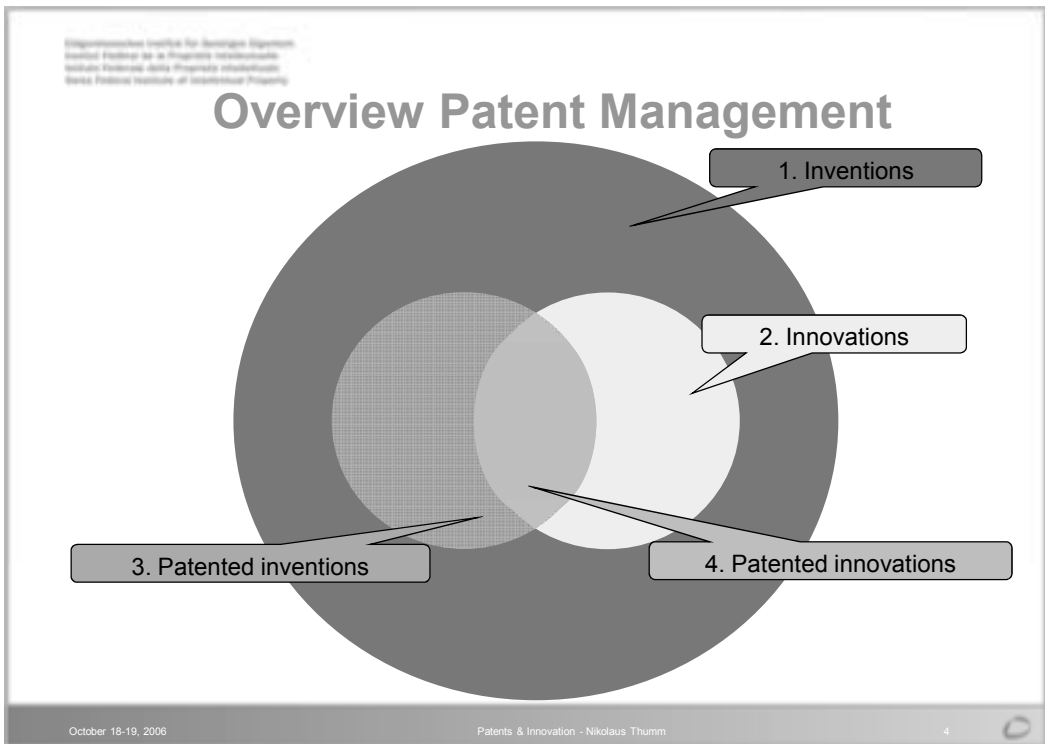
Worldwide Patent Filings



Source: WIPO Statistics Database

WIPO, Patent Report 2006


Patent Protection,
Finding the Right Balance
Protect inventions/ innovations
Incentive for research and development
With patent protection
Full knowledge access
Perfect competition
Without patent protection
October 18-19, 2006
Patents & Innovation - Nikolaus Thumm
3


Overview Patent Management
1. Inventions
2. Innovations
3. Patented inventions
4. Patented innovations
October 18-19, 2006
Patents & Innovation - Nikolaus Thumm
4

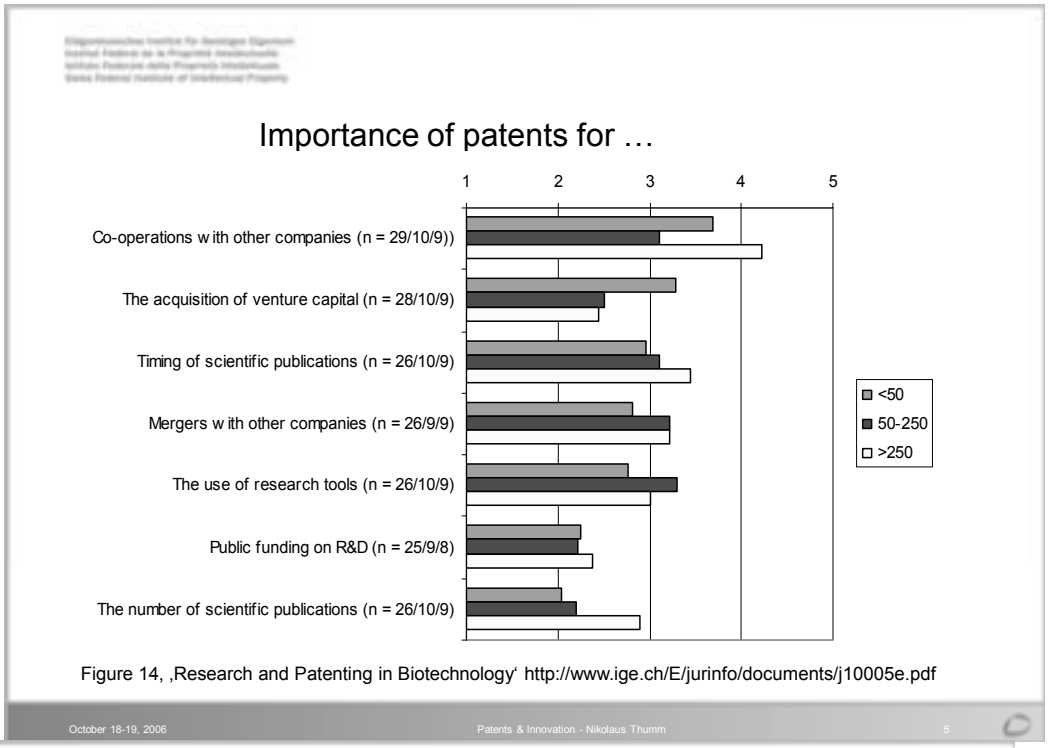
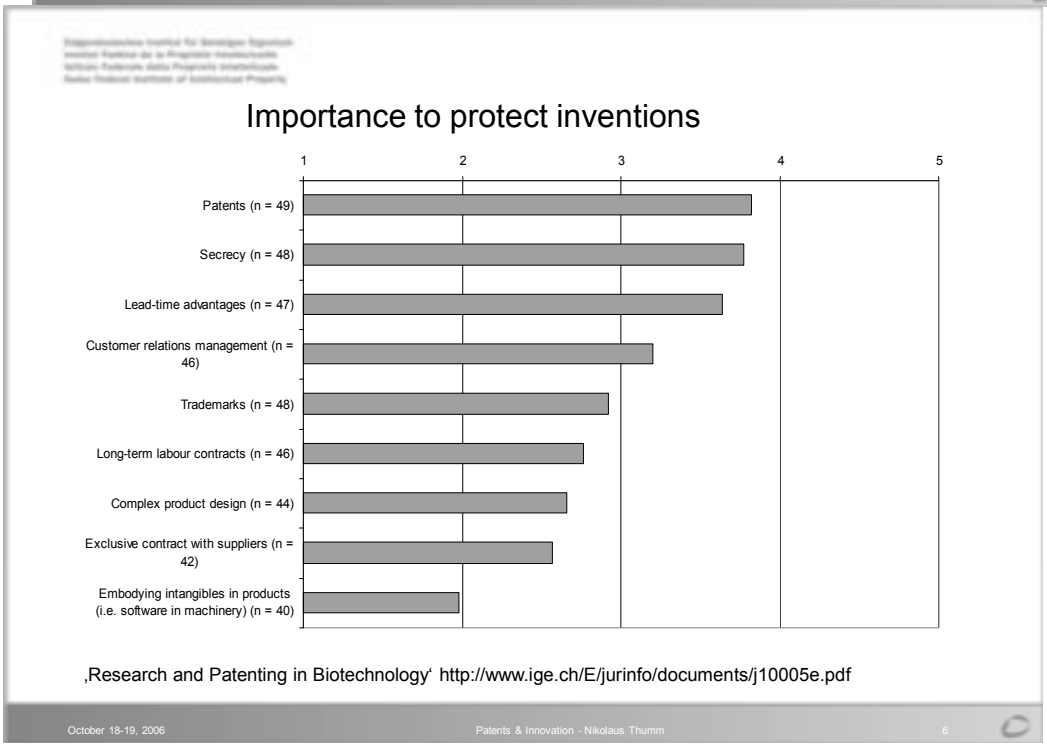


Figure 14, ‚Research and Patenting in Biotechnology' http://www.ige.ch/E/jurinfo/documents/j10005e.pdf



‚Research and Patenting in Biotechnology' http://www.ige.ch/E/jurinfo/documents/j10005e.pdf

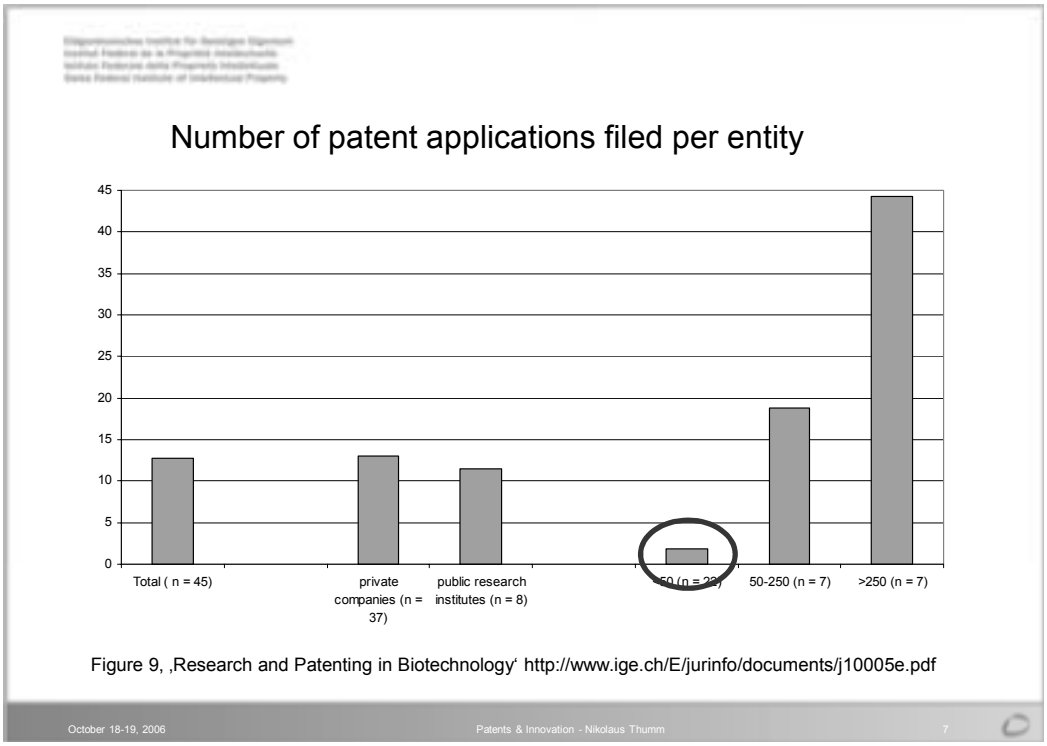


Figure 9, ‚Research and Patenting in Biotechnology' http://www.ige.ch/E/jurinfo/documents/j10005e.pdf

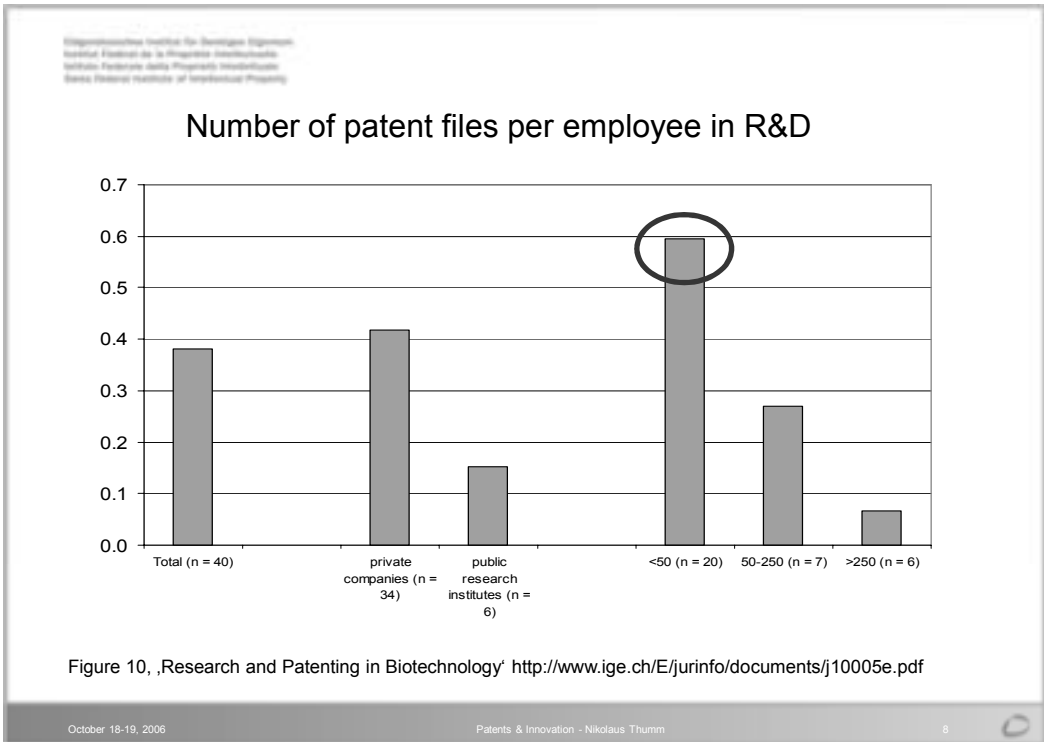
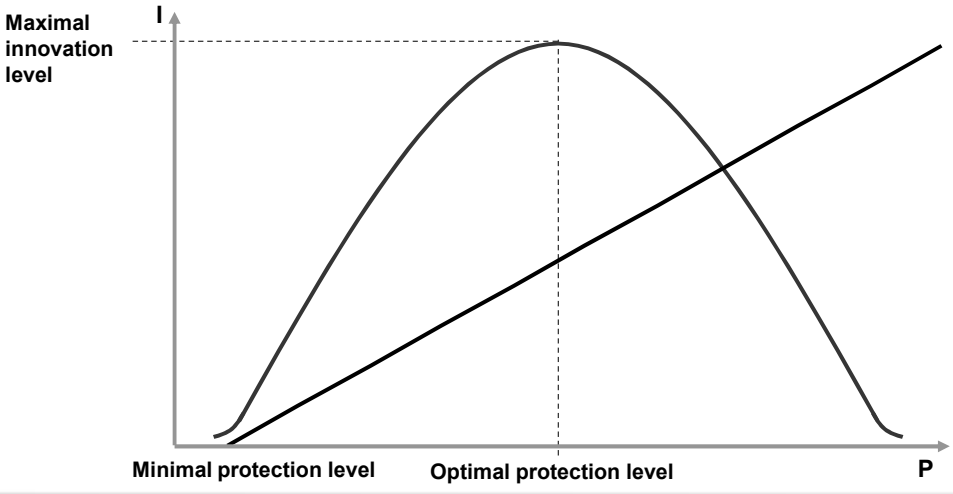
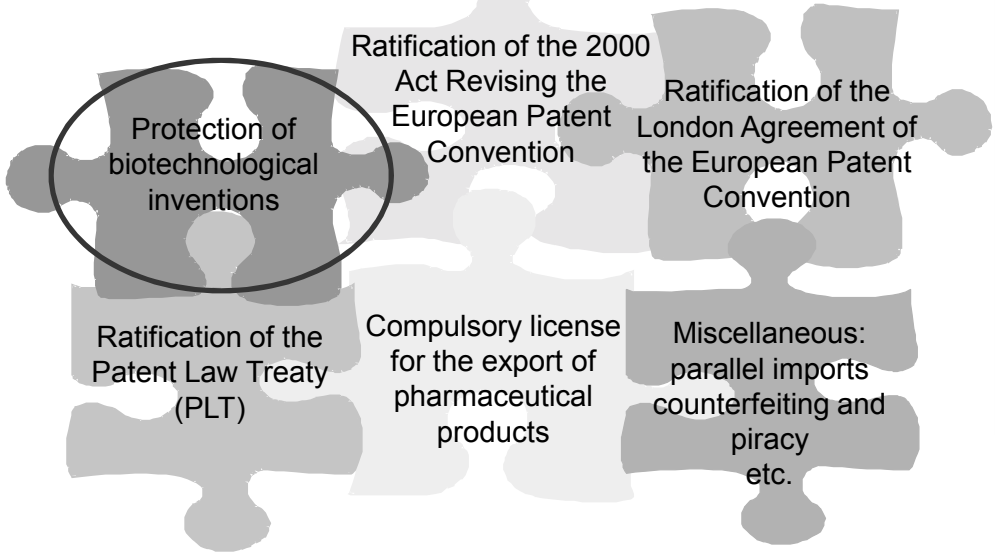


Figure 10, ‚Research and Patenting in Biotechnology' http://www.ige.ch/E/jurinfo/documents/j10005e.pdf

Patents as a Policy Measure
Protection (P) *vs.* Innovation (I)



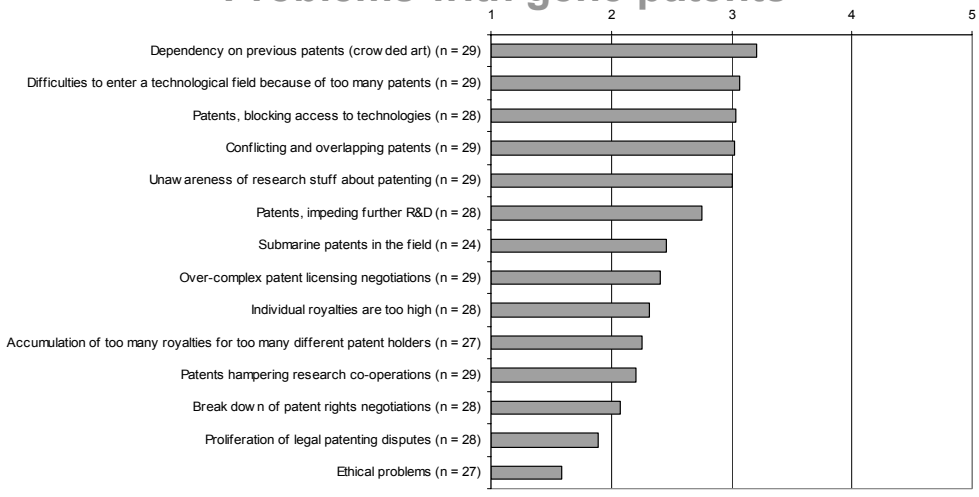
Swiss patent law revision



Policy Issues with Biotech Patents

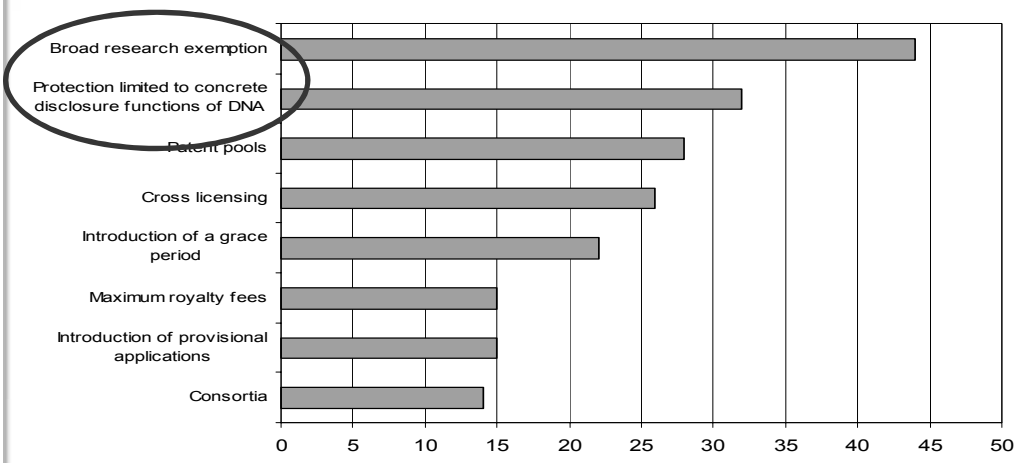
1. **Exclusions of patentability for reasons of ordre public and morality**
2. **Patenting of gene sequences**
3. **Research/experimental use exemption**
4. **Research tool patents**
5. **Patenting of diagnostic tests**

Problems with gene patents



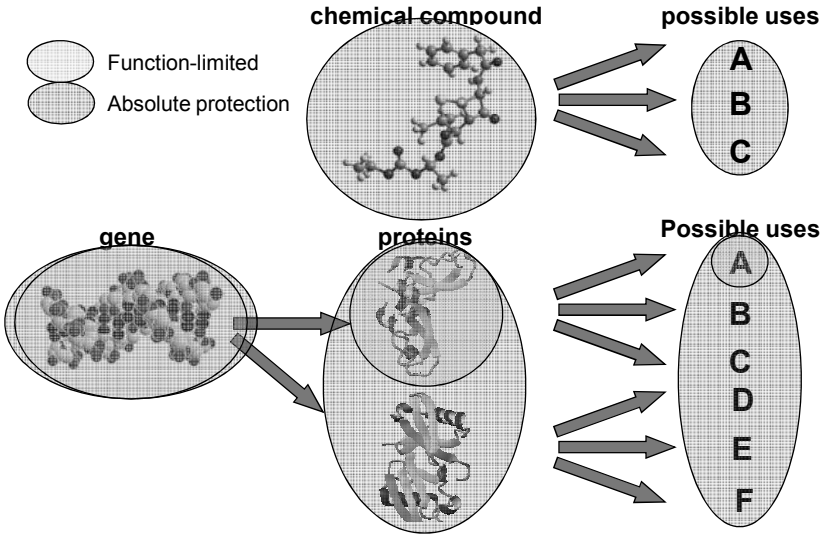
CH Survey: 8.2 Extent of Experience of Problems with DNA Patents, Fig. 34 (1=never, 5=very often) (http://www.ige.ch/E/jurinfo/documents/j10005e.pdf)

Gene patents: Proposed remedies



CH Survey: 8.2 Remedies, Fig. 35 (named as many times as effectively to ...)
(http://www.ige.ch/E/jurinfo/documents/j10005e.pdf)

Concrete disclosure function for gene patents



Consequences for R&D

This means

- **research on other functions of the same gene sequence/protein not in conflict with existing patent (outside the scope),**
- **no mutual dependence of patents,**
- **no monopolies on gene sequences as**
- **patents on other functions of the same gene sequence/protein are independent.**

This triggers

- **research on new medical uses/indications.**

Swiss Proposal for a research exemption

Art 9: general exemptions from patenting

Art 9 1a: Private use for non-commercial purposes
Art 9 1b: **Research and trials where the invention is the object of research**
Art 9 1c: Use of the invention for teaching purposes
Art 9 1d: Use of biological material for the purpose of breading or for developing a plant variety
Art 9 1e: Biological Material produced randomly or technically not avoidable in the agricultural sector

Research exemption, scope:

- All research (commercial or not) free - if aimed at gaining new knowledge about subject matter of the invention
- "Bolar exemption": Use of the invention to obtain the authorisation of a pharmaceutical product, e.g. through
  - Clinical trials,
  - Production of specimens, BUT
  - Production of the new drug only after expiration of the patent (= no stockpiling)
- No research tools
- Access guarantee through a legal license (draft Art 9a)

Summary

- Patents do matter in biotechnology
- Patents, secrecy and lead-time advantages are important protection tools
- Moderate access problems to biotech patents
- But no break-down nor systematic abuse of the patent system
- Low experience with patent pools/consortia
- Remedies under discussion:
  - broad research exemption
  - Limitation of the scope of protetion (specific disclosed functions) for DNA patents
  - Single license, compulsory licensing

Patents and Competition

- Good IP policy not maximal rights
- Better patenting than secrecy
- Encourage free market solutions
- Patenting subject to free competition and contractual freedom under the constraints of competition law
- High quality patents
- Competition for innovations is more important than price competition

Thank you!

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Info Patent Law Reform:
http://www.ige.ch/E/jurinfo/j100.shtm#a03

Biotech Report:
http://www.ige.ch/E/jurinfo/documents/j10005e.pdf

Related Articles:

Thumm, N. (2005) 'Patents for genetic inventions: a tool to promote technological advance or a limitation to upstream inventions', Technovation, The International Journal of Technological Innovation and Entrepreneurship, Vol 25/12 pp. 1410-1417

Thumm, N. (2004) 'Strategic Patenting in Biotechnology', Technology Analysis & Strategic Management, Vol. 16. No 4 December, pp. 529-538

Thumm, N. (2004) 'Motives for patenting biotechnological inventions; an empirical investigation in Switzerland'; International Journal of Technology, Policy and Management, Vol. 4, No.3, pp. 275-285

TURKEY

1. Introduction

Innovation should be regarded as the intersection between competition law and IPR law (mainly patent rules). In the debate whether competition law and IPR law are in direct contrast or not, an agreed position is generally that both systems of law try to achieve the same objective (innovation), via different ways: While the former is based on free competition, the latter is based on the creation of monopoly.

However, a proper position to create more innovation is directly dependent upon the balance to be created between competition policy and patent policy in theory and practice.

The patent law as well as competition law in Turkey is quite new compared to many other OECD members. While patent law (*Decree Law* for Protection of Patent Rights Numbered 551 Dated June 27, 1995) was adopted in 1995 as part of attempts to have a new law compatible with relevant international rules, the competition law (*The Act on the Protection of Competition No:4054 Dated 13 December 1994*) was adopted in 1994. Therefore, the debate in terms of how to make a balance between competition policy and patent policy, has not been mature enough and needs more time and enforcement of both systems of law in practice. Similarly, the debate on the policy to be followed regarding "patent-innovation relation" has not been also mature.

The main point in preparing this contribution is to show how the Turkish Competition Authority (TCA) considered innovation in its decisions and on top of that to give at least an overview of practice on the basis of the TCA cases. despite the premature nature of debate.

2. Patent and Innovation

Patent protection is generally justified on the basis of the need to preserve the incentive to innovate. To benefit from patent protection, an invention needs to meet three conditions: inventive step, novelty and industrial applicability. Considering these conditions, it is possible to argue that patent is almost synonymous with innovation. What defines a patent is mainly novelty of the innovation.

Here there is no need to discuss what lies behind the rationale for patent protection. However, it might be useful, to provide a brief explanation. The existence of market failure for the creation of knowledge requires the State to take measures. Patent represents one of the most important instruments used in countries with market economy based on free competition and property rights. Patent is a temporary monopoly right. While it envisages an almost 20 year-monopoly for the right-holder, it also ensures the creation of new knowledge and innovation necessary for the economic growth and development. Thus, patent is considered to be a contract between society and right holder: On one side *the need to protect the incentive to innovate* and on the other side *the need to meet the societies' needs and requirements*.

This contract is based on a balance. The main issue is not the existence of contract but who obtains more benefit than the other in this balance.

Turkey has a contemporary patent protection system since 1995 when *Decree Law* for Protection of Patent Rights Numbered 551 took into force. The adoption and taking into force of this law basically resulted from the obligation of Turkey under TRIPS agreement (and WTO membership) and the Customs Union Decision 1/95 between Turkey and European Union.

Since the adoption of patent law, Turkey has not significantly experienced a debate on the issues such as scope of patent, the impact of patentability conditions on innovation and whether there is a need for reform. The only exception in this regard in terms of the debate for patent protection and competitiveness of the market is the introduction of patent protection in market for pharmaceuticals.

The market for pharmaceuticals has been a major sector where the introduction of patent protection was considered a serious parameter to set the direction of competition. On the basis of her liabilities arising from both TRIPS agreement under WTO and Customs Union with the EU, Turkey did introduce patent protection for all products including pharmaceuticals. Before the introduction of patent protection, in particular the generic drug manufacturers did argue that such protection would result in less competition and more concentration and linked to this a sharp increase in drug prices. On the other hand, original drug manufacturers, almost all of whom are foreign firms, argued the lack of patent protection as a serious threat to innovation rate and future development in the market for pharmaceuticals.

Linked to the debate about the introduction of patent protection in the market for pharmaceuticals, a major recent debate was on the data exclusivity for pharmaceuticals. Here, the generic manufacturer did raise further their voice by arguing that data protection in this market would further strengthen the position of original pharmaceuticals producers and will eliminate all competition in the market. Considering its international liabilities, Turkey took the necessary initiative to introduce data exclusivity for pharmaceuticals.

Following the introduction of patent protection and data exclusivity, it has been seen that original producers introduced new products into the market. In other words, in the absence of proper protection for their products, the original drug producers seemed to be reluctant to introduce new products.

3. The Involvement of Competition Authorities in Patenting Process[1]

An interesting aspect of interface between competition policy and patent policy is about what advocacy role a competition authority may have. The possible role of competition authority (if any) in designing a proper IPR system in the country can be associated with its advocacy role.

The advocacy role of a competition authority in designing an optimum patent policy seems to be a very sensitive issue. There are some questions which might be relevant in understanding and (if necessary) limiting such role. Some of them are whether competition authorities be involved in decisions concerning granting a patent, and whether the competition authorities be allowed to challenge the validity of a patent granted.

General conditions observed by the relevant authorities in granting a patent are novelty, inventive step and industrial applicability. And the inventors have to provide detailed information in order to meet these

[1] The information provided under this heading is basically from a previous contribution of the TCA for Roundtable on Intellectual Property Rights (DAFFE/COMP/WD(2004)12). As this part seems to be relevant for the discussion on "competition, innovation and patent", it was thought useful to insert into this contribution.

conditions. The process which governs the decision whether the invention is to be granted a protection or not requires a very technical analysis and examination in order to fully evaluate the information provided.

At first sight, the above-mentioned questions seem difficult to be answered. However, a closer examination of them demonstrates that the involvement of competition authorities in the patent granting process, and their possession of the right to challenge the validity of a patent (regardless of the industry) should not be allowed for some important reasons.

First of all, these roles bring additional and unnecessary burden on competition authorities. While competition authorities (even those in developed countries) do not have sufficient resources even to deal with the existing anticompetitive issues falling under the main prohibitions of competition law, they may not allocate sufficient resources to be involved in the patent process. In addition to this, any direct role in the patent granting process requires competition authorities to be actively involved in the process which is governed by qualitatively different rules and procedures than those of competition law. The existing resources of competition authorities will not suffice to play this role properly. As is known, it is a significant source of criticism that the patent granting process is very long and painstaking, and the inclusion of competition authorities in the patent process may further complicate the issue and threatens legal certainty needed by the innovators. Therefore, patent offices must be the sole authority in granting patents. With regard to the right to challenge the validity of a patent, it could be argued that this is not the job of competition authorities. Such a role might lead the authority to be lost in complex and technical files, and importantly it prevents competition authority from fulfilling its main duties.

The above comment is basically based on the current philosophy underlying behind the existence of competition authorities. And under this approach, the inclusion of competition authorities in the patent process is not a logical option. However, it may be that competition authorities might be expected to fulfill new duties directly related to patent process. This new approach seems to introduce a revolutionary development in competition law enforcement area. And for the time being, it could be argued that competition authorities are not ready for such new duties.

With regard to its advocacy role, however, competition authorities are required to have close relations with the patent offices for some important reasons. As is stated above, in particular considering their existing duties, instruments and resources the competition authorities should not be involved in the patenting process. However, that view should not be considered to be absolute. In other words, the competition authorities might still have a role of advocacy in this process.

As is known, competition authorities have a good deal of data regarding the markets. Data belonging to competition authorities might be shared with patent offices in granting a patent related to the market in question. In this context, a patent office might take into consideration these data such as market share, concentration level, price level, the existence of anticompetitive practices etc. when exploiting its final discretion whether to grant a patent protection or not. However, it should be admitted that the discretion of the patent offices is very limited and strictly regulated by the patenting criteria by law.

4. Competition and Innovation

4.1 Dominance and Innovation:

With regard to the relation between dominance and innovation, the TCA did have some cases in which it considered the innovativeness of the dominant undertakings.

Karbogaz case[2]: In Karbogaz case where Karbogaz, the dominant supplier of carbon dioxide (CO_2) was held to infringe competition rules by concluding exclusive dealing agreements with its major customers, the TCA regarded innovative nature of Karbogaz as an asset that would contribute to its market power. Significantly, the TCA did try to differentiate between the position of Karbogaz based on anticompetitive conduct and its position based on its efficiency. In particular, the innovativeness of Karbogaz was considered to be a major trait that would make it more valuable compared to its competitors in the eyes of its customers. Therefore, it was quite difficult to make anticompetitive practice of Karbogaz distinct from its efficiency-based position. In this case, if Karbogaz would not have concluded such exclusive dealing agreements that would threaten its competitors, it would be difficult for the TCA to consider the difficulties faced by its competitors as an infringement of competition, as such difficulties would have been explicable only on the basis of competition on the merit. Here it is important to see that even if the undertaking is in a dominant position, such position is well to be associated with its innovativeness and importantly its behavior and disadvantageous position of its competitors can be understood as a corollary of normal competition in the market.

Frito-Lay case[3]: Frito-Lay case was similar in terms of the practices examined as well as the evaluation on the innovativeness of dominant undertaking which is Frito-Lay. In this case, the TCA did examine the allegation that Frito-Lay, the dominant undertaking in packaged chips market, conducted certain exclusionary practices that aimed at driving the main competitor out of the market. While examining this case, the TCA found that the market power of Frito-Lay was to a great extent to be associated with its efficiency and innovativeness compared to its competitors. Significantly, the TCA noticed that the final sale points, the main target of companies in the market, did choose Frito-Lay due to its dynamism and efficiency. In this regard, the TCA did try to make a distinction between the conducts based on competition on the merits and anticompetitive practices. In short the TCA considered the efficiency of the dominant company to a certain extent in favor of that company.

4.2 Mergers and Innovation:

There are number of merger cases where the TCA did regard the efficiency and innovation related considerations.

Cisco Systems-IBM merger[4]: In this merger case which included a transaction between Cisco Systems and IBM, the TCA defined two relevant markets which are routing products and switching products. These products are mainly used for data networking purposes. In the competitive analysis of the case, the TCA found that post merger market share would be higher than 70% in routing products market. The TCA noticed that the market has an innovative structure. Therefore the TCA considered this innovative structure as an important pressure for more competition and cleared the merger despite the high market share of the merged entity.

Sabancı-Du Pont Joint Venture[5]**:** In this case the two companies created a joint venture. The TCA did clear the joint venture on the basis of certain reasons. One of the important reasons that the TCA did take into account was the fact the joint venture would create a structure which is conducive to more innovation in the market. It was seen that the joint venture promised to introduce more R&D activity which would result in more innovation in the market. Therefore, the innovative aspect of the transaction was an important element in convincing the TCA that the transaction would not cause any competitive concern.

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2 Dated 23.08.2002 and Numbered 02-49/634-257

3 Dated 04.05.2004 and Numbered 04-32/377-95.

4 Dated 02.05.2000 and Numbered 00-16/160-82

5 Dated 09.11.1999 and Numbered 99-51/556-349

Pfizer Inc-CSL Limited case[6]: The case is related to the acquisition of animal health division of CSL Limited by Pfizer. In this case, the TCA examined a non-compete obligation imposed on CSL Limited. Following the examination of the case facts, the TCA regarded this obligation an ancillary restraint considering the fact that innovation is a backbone for animal health market and therefore the protection of technology is needed by a non-compete obligation. Therefore the transaction was cleared without any condition.

DSM-Roche case[7]: In this case, the vitamins division of Roche was taken over by DSM[8]. During the examination of the case, the TCA found that the merger would result in less innovation in the market in one of the sub markets, which is animal food enzymes. The aggregate market shares of the parties concerned in phytase market and NSP divisive enzymes were deemed as anticompetitive.

On the other hand, parties concerned applied for the European Commission and presented a commitment. In its decision, the Commission concluded that by the commitment the parties would remove serious doubts on the concentration's compliance with the Common Market.

In 1994 DSM signed an agreement with BASF AG on R&D, production, marketing, sale and distribution of animal food enzymes. On the other hand, in 1998 RV&FC, a subsidiary of Roche Group, signed an R&D agreement with Novozymes A/S on developing new animal food enzymes. In this context, the Commission added that as a result of concentration between DSM and RV&FC, there is a structural connection between DSM/BASF and Novozymes/RV&FC alliances, and an intersecting area between parties' operations on production and distribution activities occurs.

Taking into account that after the acquisition DSM would have an important position in both alliances, the Commission pointed out that the acquisition would abolish competition between Novozymes/RV&FC and DSM/BASF. Therefore, DSM undertook to terminate the DSM/BASF alliance on animal food enzymes and divest animal food enzymes operations to a third party. DSM and BASF agreed on divestiture of the alliance, and the Commission accepted the commitment.

Similarly, the TCA approved the acquisition transaction subject to DSM's divestiture of its animal food enzyme operations with BASF.

4.3 Reasons for Innovating:

In the note prepared for the purposes of this roundtable, certain factors are mentioned in relation to what motivates for more innovation. These are endurance of market power, keeping the advantage of first mover and survival against fierce competition. These factors should not be considered as being in sharp contrast to each other. In many cases, it is possible to see them interlinked.

Examination of the cases concluded by the TCA shows that companies have differing reasons to conduct R&D with a view to creating more innovation. In some markets, the final product is almost the same as innovation. In other words, competition is based on the introduction of continuously new products. In particular, the main parameter in information and communication technologies (ICTs) is innovation. In such markets, the companies mainly innovate to survive and keep their existing positions. As the technology develops and improves very quickly, then those lagging behind are prone to lose and to be driven out of market. Similar to ICTs, the innovation has become a key parameter in GSM market in

6 Dated 25.03.2004 and Numbered 04-22-248-53

7 Dated 11.09.2003 and Numbered 03-60-730-342

8 This case was previously mentioned in the contribution by Turkey on "Cross Border Merger Remedies" (DAF/COMP/WP3/WD(2005)11)

addition to the parameter of network externality. In this regard, while the incumbent operator is in the expectation of enduring its market power, the other two competitors have tried to gain a market position both to survive as well as to get more power in the market.

In the markets which are relatively mature like cigarette market and the spirit market, the companies' main motivation for innovation is to create sub-markets in order to attract the demand towards these sub-markets with a view to enduring their market position.

In the market for pharmaceuticals, mainly the original product producing firms conduct R&D and introduce new products. In some cases where they introduce a new drug for existing markets, their main motivation is to protect their market position. However, in cases where they introduce a new product for an illness for which no equivalent drug is produced, their main motivation is to get a first mover advantage in this newly created market.

5. Conclusion

Innovation is a critical aspect for economic growth and development. It is also a key term for both competition policy and patent policy. Regarding policy debate for innovation and patent policy, Turkey has not extensive experience and therefore the discussion to be provided by other contributions will be quite useful at least to get a view for possible direction of such debate in Turkey. In terms of discussion on "competition and innovation", despite its almost 10 year-experience, the TCA has shown a record-track that it has attached importance on innovative aspects in both merger and infringement cases.

UNITED KINGDOM

1. Introduction

This paper addresses a number of the themes raised in the OECD letter of 21 July 2006 to all competition delegates and observers, providing brief descriptions of relevant UK cases where possible.

This paper is divided into two sections. The first examines the relationship between patents and innovation. It looks at issues such as patent scope and patentability, as well as outlining recent and proposed changes to the UK patent regime. It ends on a discussion of how the Office of Fair Trading (OFT), the UK's principal competition authority, can influence patent policy, which has traditionally primarily been the responsibility of the Patent Office (PO), the UK's intellectual property organisation.

The second section examines the relationship between competition and innovation. It assesses the impact of competition policy on innovation using the concepts of static and dynamic efficiency and then proposes a general rule as to how competition policy should treat patent-protected innovation. In doing so, it addresses the development of economic understanding of the relationship between competition and innovation that has taken place since the UK's previous submission to the OECD on the topic of competition policy and intellectual property rights, in 1997.[1]

This paper concludes with some points for discussion at the OECD roundtable discussion in October. An annex to this paper provides some details on relevant UK cases referred to in the main text.

2. Patents and Innovation

This section briefly addresses five issues: patent scope, patentability, recent changes to the UK patent regime, ongoing IPR policy reviews and the involvement of the OFT in patent policy.

2.1 Patent scope

There is an ongoing debate whether the scope of patents currently granted potentially stifles incremental innovation. The answer may differ in different markets. For instance, an OFT economic discussion paper on *E-commerce and its Implications for Competition Policy* suggests that the protection awarded by IPRs in e-commerce markets may be excessive in some cases. The paper argues:

> In e-commerce markets, there has been some concern that the protection awarded to IPRs is excessive. […] These innovations do not require significant upfront investments in R&D, they are often little more than ideas, and thus are unlikely to justify supra normal profits for the patent holder over a prolonged period. Moreover, many are key inputs into the development of e-commerce sites.

[1] OECD (1998), 'Competition Policy and Intellectual Property Rights', DAFFE/CLP(98)18, www.oecd.org/dataoecd/34/57/1920398.pdf, pp.195-204

The ability to restrict supply of such IPRs, or to charge excessive prices for them, may therefore have significant detrimental effects on competition in e-commerce markets.[2]

Some commentators have proposed utility models[3] as a possible solution. These rights may offer sufficient protection in areas of technology where a product life is of short duration, avoiding the necessity to obtain a patent for the invention. As they are much cheaper and easier to obtain, they may be a useful form of IP protection for small and medium-sized enterprises (SMEs). They could also be tailored to be of a shorter duration than patents.

However, there are also those that argue that the benefit that a utility model system offers may be outweighed by risks of increased litigation arising from the lack of legal certainty surrounding these rights. The presence of utility models could create further barriers to market entry for those who have legitimate innovations who do not wish to risk litigation.[4] This may especially be true for SMEs.

On the other hand, it is a fact that many countries successfully operate such systems and there is no strong evidence that these problems are significant.

There may be merit in looking at further differentiations in the UK's IPR regime. Policymakers could, for instance, design IPRs (of a specific duration, breadth/scope, charging regime etc.) according to the innovation type, cost structure, market size and market alternatives to formal IPRs available to innovators under a specific market conditions.[5] However, policymakers must be aware of market definitional issues and the practicability of such an approach, which is radically different to the largely "one-size-fits-all" IPRs regime of today.[6]

2.2 Patentability

The term "a patentable invention" is defined in UK law by setting out four conditions, all of which must be satisfied in order for an invention to qualify for the grant of a patent. These are: (a) the invention is new; (b) it involves an inventive step; (c) it is capable of industrial application; and (d) it must not be on a

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2 Frontier Economics (2000), E-commerce and its Implications for Competition Policy, OFT Economic Discussion Paper 1, p.49.

3 Also known as "petty patents" or "utility innovations", the conditions for the registration of utility models are usually less stringent (since they have a lower inventive step), the procedure for registration is faster (they are usually not examined prior to registration) and acquisition and maintenance fees are generally lower than those applicable to patents.

4 For instance, companies may adopt strategies of making large numbers of utility model registrations, increasing the number of rights relevant to exploit a particular invention and adding to existing problems that have been associated with "patent thickets".

5 Note, however, that in this context it is important to consider Article 27(1) of the WTO TRIPs Agreement, which states: "[…] patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced."

6 Interesting lessons may be learnt here from the change in motives of innovators as a result of the introduction of software patents in the US in 1995. See e.g. Bronwyn H. Hall and Megan MacGarvie (2006), 'The Private Value of Software Patents', Working Paper presented to the First Annual Conference of the EPIP Association, 7 September 2006.

list of exclusions.[7] These exclusions include discoveries, literary and musical creations, business methods, computer programs, and the presentation of information (such as this paper).

There has been considerable debate within the UK and the rest of Europe over recent years about whether to remove computer programs from the list of exclusions. This was prompted by a proposed EU Directive,[8] which was rejected by the European Parliament in July 2005.

Despite its rejection, some commentators argue that patents relating to software are increasingly being granted in the UK and other European countries. For instance, by embedding software into hardware, patentees are arguably able to disguise their invention and largely bypass the exclusion within patent law. Furthermore, patent examiners often find it very difficult to assess the novelty of such inventions because of problems associated with assembling the "prior art".

The rejection of the Directive gives policymakers an opportunity to reassess the issue in light of new economic literature on the impact of software patents in the US.[9]

With regards to the patentability of business methods, which are also on the list of exemptions, the PO reported the results of a consultation exercise in 2001 which included questions to industry on whether the patenting of these would be likely to increase innovation. SMEs were particularly worried about the potentially increased regulatory burden associated with business method patents. A strong argument against patenting business methods is that they do not require costly R&D. The PO's view is that ways of doing business should remain unpatentable.

There has also been debate as to the patenting of genetic inventions, especially given the controversy regarding the Human Genome Project and the wholesale patenting of genes by Craig Ventner's firm Celera Genomics. In consequence of this, UK examination guidelines[10] and practice with regard to gene patenting have recently been revised. More work remains to be carried out on the economic implications of genetic inventions, including whether they create an anti-commons situation.[11]

2.3 Recent changes

The Patents Act 2004 introduced new provisions to help with patent enforcement and dispute resolution, making significant changes to primary legislation. Changes included: (1) the introduction of an "opinions service" from the PO, allowing parties to have a quick, non-binding opinion on matters of patent

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7 It is apparent that the corresponding wording in the European Patent Convention (Article 52) is slightly different to the wording in the UK Patents Act but the outcome of an analysis would normally be the same.

8 EU Directive on the patentability of computer-implemented inventions (2002/0047/COD).

9 E.g. Bessen and Maskin (2000) "Sequential innovation, patents and imitation", MIT; and more recently, Michael Noel and Mark Schankerman (2006), 'Strategic Patenting and Software Innovation', CEPR Discussion Paper Series, No. 5701.

10 See http://www.patent.gov.uk/biotech.pdf

11 The idea behind the anti-commons is that when multiple owners each have a right to exclude others from a scarce resource and no one has an effective privilege of use (a reverse of the tragedy of the commons). It was suggested to be a problem in the biomedics sector by Michael A. Heller, Rebecca S. Eisenberg (1998), 'Can Patents Deter Innovation? The Anticommons in Biomedical Research', Science, Vol. 280. no. 5364. Note, however, that a 2004 report by the Intellectual Property Institute concluded that there is "no evidence to suggest that conditions for patenting genetic sequences unduly favour the private sector, or that there are unnecessary constraints on research activities within the public sector". This report can be accessed at: http://www.dti.gov.uk/files/file10475.pdf

validity and infringement; (2) reform of the "threats" provisions, making it easier for parties in dispute over infringement to negotiate; and (3) a new requirement for the courts to consider the relative financial position of the parties when awarding costs in infringement proceedings.

It is too early to say with any certainty what effects these provisions may have on innovation. However, the PO argues that these deregulatory changes (and other recent changes) will encourage innovation by providing a more flexible, forgiving and accessible patents system, and that the measures to improve enforcement and dispute resolution options will have a positive effect on UK business.

2.4 Current UK policy reviews

Two important reviews relating to the UK's patent system are currently being carried out. The results of both these reviews are not yet in the public domain. Their findings are expected to be published by the end of 2006. The OFT would be very interested to hear thoughts on their findings once they have been published.

Firstly, the UK government has commissioned a wide ranging review of the current IP regime, the "Gowers Review".[12] The Chancellor of the Exchequer commissioned Andrew Gowers, former editor of the Financial Times, to lead this independent review in December 2005.

Its scope is very broad, covering patents, copyrights and other IPRs. It will examine both UK and European issues. Its broad aim is to ensure that the current regime "delivers incentives while minimising inefficiency". Specific items to be assessed include: (1) the system of awarding IPRs; (2) the different uses of IPRs; (3) the exchange and trade of IPRs; and (4) the system of challenge and enforcing IP.

The Gowers team intends to advise Government on practical problems with the existing framework, not to propose an overhaul of the system. It plans to make "targeted and practical policy recommendations". The review is currently in its analytical phase and is expected to report its findings to the Government this autumn.

The review's primary methodology has been a wide-ranging stakeholder consultation. Andrew Gowers published a Call for Evidence paper in February 2006 which outlined some of the issues that were being considered. It invited government departments, industry and members of the public to submit written responses to the review team. The OFT submitted a short paper specifically addressing the treatment of IPRs under EU and UK competition law.[13]

Specific areas raised in the call for evidence included questions around: (1) the complexity of the current system of research exemptions for university research; (2) the international complexity and duplication of the patent system; (3) the lack of awareness among SMEs of the patent system; and (4) the interaction of the IP and competition regimes.

Secondly, a review of the "inventive step requirement" of patent protection is currently being coordinated by the PO. This is of particular interest because it is difficult to define appropriately in law and to apply uniformly and objectively.

The review, which is currently analysing the responses to a public consultation, is addressing the following specific questions: (1) Is the inventive step requirement for patentable inventions in the United

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12 See http://www.hm-treasury.gov.uk/independent_reviews/gowers_review_intellectual_property/gowersreview_index.cfm

13 This is expected to be published alongside the review by the end of the year.

Kingdom right for inventors, the public at large, and the UK economy? (2) Are too many "trivial patents" being granted? (3) Are innovation and competitiveness best served by easy patenting with low hurdles?

2.5 The OFT and patent policy

There are two ways in which the OFT has a role in relation to patents: (1) it can intervene under competition legislation; and (2) it can inform the debate through competition advocacy. The first, which is the more traditional role of competition authorities, is discussed in detail in the following section. The second avenue is discussed briefly below.

Since 2001 the OFT can conduct a variety of activities that aim to identify and address all aspects of market failure, from competition issues to consumer detriment and the effect of government regulations. The OFT's proactive powers can be used to address issues in particular markets, but also practices across a range of markets.[14]

It seems clear that the patent system is not always perfectly fine-tuned, in terms of matching *ex post* returns with the required investment in innovation *ex ante*. For instance, patents are sometimes awarded for relatively obvious inventions. Issues that could be examined by the OFT in relation to this include: (1) the duration of IPRs, especially with respect to the *ex post* extension of patents and copyrights; (2) which type of IPR to allocate, including the patentability of software; (3) the application of threshold criteria, or the level of "inventiveness"; and (4) the institutional incentives of the PO.

3. Competition and Innovation

The UK's competition regime with respect to IPRs changed following the introduction of the Competition Act 1998 and currently distinguishes between the existence and exercise of IPRs. Since then, however, a new economic consensus also appears to be emerging on the relationship between static and dynamic efficiency. This section asks whether the current UK legal framework has struck the right balance between static and dynamic efficiency, in terms of recent competition cases involving IPRs. The discussion concludes with three general principles as to how competition policy might treat patent-protected innovation.

3.1 The UK's competition regime with respect to patents

The UK has experienced a significant change in the way competition cases relating to the exercise of IPRs are treated under the law. Prior to 1 March 2000 (the date on which the Competition Act 1998 entered into force), the Patents Act had specific competencies with respect to certain provisions in patent licences. Since 2000, allegedly anti-competitive provisions in patent licences have largely been considered under the Competition Act. This change is interesting in that the new framework is more flexible, reflecting a more economic approach to assessing anti-competitive practices. The change is outlined in more detail below.

In the old regime pre-2000, Sections 44 and 45 of the Patents Act 1977 provided for the nullity of certain restrictive conditions within contracts relating to patented products. Section 44 rendered automatically void certain tie-in clauses in licences, whilst Section 45 allowed either party to a licence concerning a patent or patents which had expired or been revoked to terminate the licence to the extent that the contract related to the subject-matter of the expired patents in question. Where a term that was void

[14] The core methods by which the OFT is proactively involved in the policy-making process includes competition advocacy, regulatory impact assessments, economic research and market studies. And by the end of 2006, the OFT will have a new "horizon scanning" team that aims to monitor the economy for areas of productivity weakness and consumer detriment.

under section 44 was included in a patent licence, any person (not just the licensee) had a defence to an infringement action in respect of that patent.

Sections 44 and 45 were repealed in 2000. Now Chapter I and Chapter II prohibitions of the Competition Act 1998 are instead applicable to agreements whereby the holder licenses another undertaking to exploit his or her intellectual property rights.[15] This approach is markedly different to that previously. Whilst the old Patents Act provisions explicitly outlawed specific types of tie-in clauses, the current provisions under the Competition Act are more nuanced. In line with modern economic thinking, it is now considered that tying in does not necessarily have anti-competitive effects and is therefore not necessarily deemed illegal.

While the Competition Act removed two "patent law" provisions specifically intended to limit the exercise of potential market power by patentees, there are nevertheless provisions contained within the Patents Act that could be invoked to correct potential anti-competitive circumstances arising the exercise of patent rights. Following a market investigation or merger case, Section 50A of the Patents Act allows the Competition Commission (the UK's other competition authority)[16] to apply to the Comptroller of Patents to make a license under the offending patent available to applicants as a matter of right. Hence some competition issues remain governed by patent law and not competition law. Technology licensing is also addressed in the European Commission's Technology Transfer Block Exemption Regulation and *Guidelines on the Application of Article 81 of the EC Treaty to Technology Transfer Agreements*.[17] These guidelines make it clear that there is no presumption that IPRs and licence agreements as such give rise to competition concerns.

3.2 Static and dynamic efficiency

Economics distinguishes between static and dynamic efficiency. In the static case, there will often be a monotonic relationship between market power and efficiency. Monopoly therefore typically causes allocative inefficiency because the monopolist charges too high a price for any given production technology. Monopoly also causes productive inefficiency if the monopolist does not adopt the most efficient technology available. In the dynamic case, however, it is increasingly being recognised that there is no such simple monotonic relationship between market power and innovation.

In 1997, the UK's submission to the OECD roundtable on competition policy and IPRs read:

> The OFT generally treats IPRs in the same way as other types of property. As with any competition policy case, intervention occurs only when a serious abuse of market power (or collective behaviour) has been identified. *It is also important to recognise that although IPRs may restrict short-run price competition, they also promote long-run dynamic competition between firms.*[18]

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15 Articles 81 and 82 of the EC Treaty would also apply to patent licences that had an effect on trade between EU Member States. These treaty articles would also have applied prior to the entry into force of the Competition Act.

16 See Paul Geroski (2006), 'Appealing to the Competition Commission', Essays in Competition Policy, Competition Commission, pp.17-22 for a concise explanation of the relationship between the CC and the OFT. This is available for download at: http://www.competition-commission.org.uk /our_role/analysis/essays_in_competition_policy_paul_geroski.pdf

17 http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/c_101/c_10120040427en00020042.pdf

18 OECD (1998), op.cit., p.203

This approach to IPRs is based on the "Schumpeterian" view that static competition is not good for innovation. In his essay *Creative Destruction*, Schumpeter claimed that "the introduction of new methods of production and new commodities is hardly conceivable with perfect – and perfectly prompt – competition from the start".[19] The reason behind this claim was that firms need an incentive to innovate. If firms make no private gain from innovation (i.e. profit) they will not undertake R&D. In order to ensure that firms receive a return to their R&D effort, and thus have an incentive to innovate, it is important that other firms cannot simply copy an innovation and free ride on R&D effort. This can be taken to imply the need to guarantee a firm has a monopoly position post innovation.

However, a new economic consensus appears to be emerging. Recent theoretical models have found that an increase in the intensity of rivalry between firms is good for innovation and hence growth and productivity. These models make a distinction between two types of technological progress: (1) *leapfrog*, the Schumpeterian idea that a follower can leapfrog the technological leader in one move to become and even replace the new leader; and (2) *catch-up* or *step-by-step* innovation, where firms compete "neck and neck" and must reach the current level of technology before moving onto the next level.

These theoretical models have received empirical support. Aghion et al[20] find an "inverted-U" shaped relationship between innovation and product market competition. Starting from a low level of product market competition (PMC), more PMC may increase the incremental profits from innovating, and thereby encourage R&D investments aimed at "escaping competition". Hence the possibility of a positive correlation between PMC and innovation. When PMC is high, however, a large fraction of firms are in unlevelled industries where the Schumpeterian effect of PMC on laggards' R&D and innovation is most likely to dominate. The precise shape of the resulting inverted-U will vary by market type. Therefore there are indeed conditions under which formal IPRs *can* inhibit innovation, contrary to our opinion expressed in 1997.

3.3 Striking the balance

The patent system aims to foster dynamic efficiency, if necessary over static efficiency, by allowing for the existence and exploitation of market power within the patent in order to generate incentives for innovation. Current UK competition law draws a distinction between the "existence" of intellectual property rights and the "exercise" of those rights. The existence of IPRs is not subject to competition law but the exercise of IPRs can be.

For example, licensing of intellectual property rights is an exercise and can be subject to competition law scrutiny. In contrast, questions about what subject matter *ought* to be protected by intellectual property rights fall into the category of existence, would instead be dealt with under patent law. If competition law were to attempt to regulate or limit the grant or the scope of intellectual property rights on an *ad hoc*, *ex post* basis, there is risk that this would lead to considerable uncertainty for firms, undermining incentives to innovate.

How closely these principles align to the practical application of competition law is unclear as there have been few recent competition cases in the UK concerning IPRs. An annex to this paper provides an overview of some UK cases. Some commentators have suggested that EC competition law has on occasion intervened to correct anti-competitive effects of intellectual property rights that ought not to have been

19 Joseph Schumpeter (1942), Capitalism, Socialism and Democracy. New York: Harper & Brothers

20 E.g. Aghion, Harris, Howitt and Vickers (2001), 'Competition, Imitation and Growth with Step-by-Step Innovation', The Review of Economic Studies, Vol. 68; and more recently, Aghion, Bloom, Blundell, Griffith and Howitt (2005), 'Competition and Innovation: An Inverted-U Relationship', QJE, Vol. 120 No.2.

granted in the first place. These views were expressed following the European Commission decisions in *Magill*[21] and *IMS*[22] in which copyright holders in a dominant position were required to license their intellectual property rights.

A pertinent discussion point is whether the distinction between existence and exercise remains an appropriate one for competition authorities to maintain. There is greater scope for competition and IP officials to work together to address this issue. For instance, it may well be the case that competition law can have a place in dealing with some situations in which IPRs have been obtained or extended by unlawful means, at least where the IPR-proprietor is a dominant company.

In asking to what extent this legal distinction between existence and exercise balances static and dynamic efficiency, it is useful to distinguish between two possible forms of exercise: (1) exploitation and (2) exclusion or leverage. Arguably, competition authorities should avoid intervention in the first form of exercise (other than in exceptional circumstances), since this could have a detrimental impact on dynamic efficiency. However, with regards to the second, there may be circumstances where intervention is necessary. For instance, the patent system does not specifically require, or allow for, the extension of market power through leverage into either new markets or for additional periods.[23]

3.4 Policy implications

The above discussion suggests three general principles as to how competition policy might appropriately treat patent-protected innovation:

a. Competition policy *should avoid* intervention against holders of patent- protected innovation where intervention would pose a significant risk to dynamic efficiency and competition concerns are solely about static efficiency (i.e. if there is no concern about the extension of market power into related markets or future periods). For example, an excessive pricing case which limited the rewards bestowed by the patent system could slow the rate of innovation, and could prove over-burdensome if the market power was temporary.

b. Competition policy, conversely, *should* intervene if concerns are primarily about dynamic efficiency, for example because major innovations often come from small firms introducing disruptive technologies rather than from dominant firms who profit more from the status quo. So to promote innovation, dominant firms should be prohibited from abusing their market power to impede smaller rivals who would otherwise overtake them.

c. Lastly, competition policy should *also* be used to intervene in markets where there is no compelling dynamic case and an obvious short-run static case for doing so.

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21 Commission Decision (89/205) OJ 1989 L78/43, upheld on appeal by the CFI in Cases T-69/89 etc. [1991] ECR II-485 and by the ECJ in Cases C-241/91P etc. [1995] ECR I-743.

22 (Interim Measures) OJ 2002 L59/18. Interim measures were suspended by the CFI and ECJ (see, e.g. Case C-481/01P (R) [2002] ECR I-3401.

23 Note also that a key part of the patent system is patent litigation (or threat of such litigation). This can in itself give rise to competition concerns, especially where it is used to undermine competitors, or where out-of-court settlements are reached between competitors.

4. Concluding comments

A1 This paper has discussed in broad terms some of the questions posed by the OECD letter of 21 July 2006. It has raised a number of points for discussion at the roundtable discussion in October. These include, in no particular order:

Is there scope for creating new types of IPRs that cater for specific market conditions?

What are the respective merits of systems that address the use of IP under competition law or patent law?

Is there an agreement on the general principles as to how competition policy should treat patent-protected innovation, as outlined in the previous section?

If so, does this bring the traditional distinction between existence and exercise in competition law into question?

ANNEX: SOME RELEVANT UK COMPETITION CASES

A1 This annex outlines some relevant UK cases in which intellectual property has played a role. For a detailed discussion of other (primarily US and EU) cases, see Part II of the OFT's Economic Discussion Paper No. 3, published in March 2002 and available for download from the OFT's website (www.oft.gov.uk).

Anti-competitive practices

A2 In its 1995 anti-monopoly investigation into *video games*, the (then) Monopolies and Mergers Commission objected to SEGA and Nintendo's use of proprietary systems protected by IPRs; their use only of licensed game-software developers; and their pricing structures that lowered the hardware cost of the games console to build an installed base from which profits were earned on the subsequent sale of games software. The CC recommended in part that SEGA and Nintendo—then duopoly suppliers of video games consoles—grant licences to competitors. Subsequently, by 1998 Sony's PlayStation (an entrant in 1995) was the market leader and by 2001, SEGA had exited to be replaced by Microsoft's Xbox.[1]

A3 The 2002 case of *Intel v VIA Technologies* raised the issue of licensing practice and abuse of dominance.[2] The case concerned an action for patent infringement by Intel in relation to microprocessors and chipsets supplied by VIA. As well as disputing patent validity and infringement, VIA raised defences under competition law, alleging that Intel's refusal to license its patents on reasonable terms was an abuse of a dominant position and would affect VIA's ability to compete with Intel, as well as preventing products coming to market. VIA's defences were rejected by the High Court but reinstated by the Appeal Court. The case settled out of court but the Appeal Court decision suggests that the exercise of an exclusive IPR could be an abuse of dominance in circumstances that were less stringent than previous EU case law (i.e. the "exceptional circumstances" of the IMS and Magill cases, which essentially amounted to refusal to licence preventing the creation of an entirely new product market).

Merger control

A4 In clearing at 'phase I' the 2004 acquisition of *Landis and Gyr by Bayard*, the OFT replied dynamic competition from new technologies in the relevant product market for electricity meters. Pre-merger, there were 4 competitors with proprietary electricity-metering standards. Notwithstanding the high combined share of supply of Bayard and Landis & Gyr, the OFT noted that the market historically had been categorized by the emergence of new technologies that

1 Gartner, a consulting firm, estimated that Sony's PlayStation had a 51% market share in 2005, Microsoft's Xbox a 34% market share and Nintendo's GameCube a 15% market share.

2 The Appeal Court judge (Vice-Chancellor Morritt) memorably remarked (at paragraph 89 of his judgement): "the ingredients of computer technology, patent infringement and Articles 81 and 82 make a somewhat indigestible dish".

rapidly won both acceptance and market share. The OFT expected this trend to continue, so reliance on market shares would have misrepresented the competitive impact of the merger.

A5 In 2004, the Competition Commission cleared at 'phase II' the acquisition of *Bio-Rad Microscience by Carl Zeiss*, both suppliers of high-end, bespoke scientific microscopes, sold mainly to academic and physical research institutions. The merger essentially was to resolve patent litigation (Bio-Rad claimed that Zeiss had infringed its microscope patent).[3] Other than Bio-Rad and Zeiss, Leica was the only other supplier in the relevant market; also with proprietary, patented microscope technology. The CC concluded that Bio-Rad would have exited in any event absent the merger and that sufficient incentives to innovate would remain given technological competition between Zeiss and Leica.

[3] In this sense, the case was related to the economic literature on the antitrust limits of settlements in disputes over so-called weak patents, i.e. that the settlement should leave consumers no worse off than ongoing litigation. See, e.g. Shapiro (2003) "Antitrust Limits to Patent Settlements", RJE, 34:2, 391-411.

UNITED STATES

1. Summary

Patent policy has been crucial to the high level of innovation in the United States, and innovation has been an important driver of increased consumer welfare. The state of innovation in the United States and developed countries is generally healthy, and patent policy is a part of a status quo that has benefited consumers; therefore, competition agencies should formulate antitrust policy concerning patents with care, and approach proposed changes to patent policy with caution. For a number of reasons, antitrust law is not an appropriate tool for correcting errors in the patent system; it should not be used simply to second-guess or limit the decisions of patent authorities. In particular, competition authorities should be careful that their actions do not undermine the predictability of patenting and patent enforcement.

At the same time, competition is also a driver of innovation, and competition agencies should continue to foster competition's ability to confer benefits in that role. The United States agrees that competition authorities have a significant role to play in promoting innovation. For example, they can participate in public debate concerning patent policy by providing expertise in economic analysis and insights into the role of competition in promoting innovation. Moreover, they can clarify antitrust rules governing agreements and collaborations involving IP in a manner that increases predictability and promotes innovation. The US competition authorities have played both roles.

2. Introduction

This paper draws, in part, upon the recent work of the US Department of Justice (DOJ) and the Federal Trade Commission (FTC) exploring the relationship between competition policy and intellectual property policy. During 2002, the DOJ and FTC held 24 days of hearings devoted to this topic and heard presentations from over 300 panellists, including representatives from academia, private industry, the private bar, and various government agencies. The FTC/DOJ Hearings devoted special attention to the pharmaceutical, biotechnology, Internet, and computer hardware and software industries. The FTC subsequently published a report entitled *To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy*, which recommended adjustments in the patent system (FTC Report).[1]

This paper also reports on several recent patent law developments arising in the three branches of the US government: the legislature, the courts, and the executive agencies. While many of these developments – particularly in the legislature – have not yet reached a conclusion, the recent activity suggests an increasing appreciation of economic principles in the formation of patent policy, including strategies to prevent economic harm from invalid or unenforceable patent claims. These developments potentially could result in significant changes to the US patent system. In addition, this paper describes several instances where US competition policy has successfully addressed challenges to innovation in a manner that encourages innovation.

[1] Federal Trade Commission, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy, (Oct. 2003) (hereinafter, "FTC Report"), available at http://www.ftc.gov/opa/2003/10/ipreport.htm.

3. The Relationship Between Patent and Competition Policy in Promoting Innovation

Patent policy and competition policy ultimately share the same goal: to strengthen economies and improve consumer welfare. While patent policy's focus on promoting innovation is perhaps more immediately obvious, innovation is no less important to competition policy: competition policy can be understood in terms of promoting efficiency,[2] and innovation is key to "dynamic efficiency," as many economists have suggested.

"Static efficiency" describes the tendency of firms in a competitive marketplace to reduce costs by refining existing products and capabilities. In a competitive economy, rival firms quickly adapt to an existing technology and drive the price of products and services embodying that technology down to something close to the cost of unit production ("marginal cost"). While this process is a significant force in improving consumer welfare, sometimes the greater driver of growth is "dynamic efficiency," which refers to gains that result from entirely new ways of doing business. The economist Joseph Schumpeter described dynamic efficiency as "competition from the new commodity, the new technology, the new source of supply, the new organisation . . . competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives."[3]

A potential problem for competition policy is that the same forces that yield the benefits of static efficiency – *e.g.*, conditions that encourage rivals quickly to adopt a new business method and drive their production toward marginal cost – may discourage innovations (and thus dynamic efficiency) if this drive toward marginal costs occurs at such an early stage that it makes innovation uneconomical. In industries where innovation requires substantial fixed investments or up-front research and development (R&D) costs, a rational firm may elect not to innovate if it anticipates a selling environment that quickly resolves to marginal cost.[4] When deciding upon uses of their available capital and effort, rational firms carefully weigh profit opportunities from innovation efforts against profit opportunities from other activity.

Seen in this light, patent protection should be viewed not as a concept separate from competition principles, but as a subset of competition policy. Properly applied, patent protection can create the space necessary to permit firms in a highly competitive market to profit from their inventions for limited times, which encourages innovation effort. Valid patents thus encourage firms to engage in competition through innovation by promoting innovative effort and dynamic efficiency. Patent policy, therefore, is clearly complementary to competition policy.

The FTC/DOJ Hearings, along with the FTC Report, confirmed that both competition and patents play important roles in stimulating innovation. The complementary nature of these two systems in encouraging innovation stretches across industries. Panellists at the Hearings reported that the degree to which innovation depended on one system or the other, however, varied somewhat by industry, as explained below.

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2 E.g., Gerald F. Masoudi, Intellectual Property and Competition: Four Principles for Encouraging Innovation, address at the Digital Americas 2006 meeting (Sao Paolo, Brazil, April 2006) 13-15, available at http://www.usdoj.gov/atr/public/speeches/215645.pdf.

3 Joseph Schumpeter, Capitalism, Socialism and Democracy 84 (Harper Perennial 1976) (1942).

4 For example, Hearings participants in the pharmaceutical industry expressed concern about their ability to recoup their substantial R&D costs, and the importance of patents in achieving both recoupment and profits. FTC Report, Ch. 3 at 11-12.

3.1 Patents Promote Innovation

Patent policy benefits the public by providing an incentive to develop and commercialise inventions with substantial utility. Without patent protection, innovators that produce intellectual property may not be able to appropriate sufficient benefits of their innovation to justify their creative effort, since intellectual property is particularly susceptible to misappropriation and free riding. The problem is especially acute when the original innovator's efforts entail substantial fixed costs, and the imitators can copy the innovation cheaply. Patent rights mitigate this problem by granting exclusive rights in innovations, enhancing appropriability. The need for such protection has long been understood; the original articles of the US Constitution, adopted in 1789, authorise Congress "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries."[5]

Patents can also facilitate commercialisation of the invention that the patent protects. Patent rights make it easier for inventors to develop relationships with others who invest in the further work needed to commercialise the invention. Moreover, the public disclosure of scientific and technical information is part of the consideration that the inventor gives the public, and such disclosure can stimulate further scientific progress.[6]

At the FTC/DOJ Hearings, representatives from the pharmaceutical industry stated that patent protection is indispensable in promoting pharmaceutical innovation for drug products. By preventing rival firms from free riding on the innovating firms' discoveries, patents can enable pharmaceutical firms to cover their fixed costs and recoup their high levels of investment in R&D efforts.[7] Representatives from the biotechnology industry explained that many biotechnology companies conduct basic research to identify promising products, and then partner with a pharmaceutical company to test and commercialise the product. They seek patent protection to attract investment from capital markets, and to facilitate inter-firm relationships, such as licensing and joint ventures, necessary for commercial development of their inventions.[8]

3.2 Competition Promotes Innovation

The FTC Report found that competition can also stimulate innovation. Economic theory and empirical evidence suggest that the effect of an increase in competition on innovation will vary from one context to another. For example, panellists stated that firms in a competitive market generally have greater incentives to innovate than a monopolist that does not face the threat of entry.[9] In some industries, firms often innovate to exploit first-mover advantages (at least when, among other things, copying the innovation is expensive or time-consuming).[10] Moreover, some panellists noted that firms competing to innovate will approach research problems differently, increasing the chances of successful innovation.[11] Panellists also debated the hypothesis, originally espoused by Schumpeter, that "large and often monopolistic enterprises"

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5 US Const. Art. I, § 8. Other sections of this constitutional provision authorise copyright law.

6 See FTC Report, Ch.2 at 3-7.

7 FTC Report, Ch. 3 at 11-12.

8 FTC Report, Ch. 3 at 15, 17-18.

9 FTC Report, Ch. 3 at 9-10; see generally Kenneth J. Arrow, Economic Welfare & the Allocation or Resources for Invention, in The Rate and Direction of Inventive Activity, 609, 619 (1962).

10 FTC Report, Ch. 2 at 9-12.

11 FTC Report, Ch. 3, at 15-16.

are "the principal engines of technological progress." Some critiqued this hypothesis directly, while others contended that the hypothesis is true for some industries but not in others.[12]

At the FTC/DOJ Hearings, many participants representing computer hardware companies observed that competition, rather than patent protection, drives innovation in their industries.[13] In the semiconductor industry, for instance, obtaining lead-time over rivals (a function of the competitive process) and trade secret protection provide the key mechanisms for appropriating returns on R&D investments.[14] Representatives of software and Internet companies made similar observations that competition to commercialise the most recent technological advance provides the primary driver of innovation.[15]

3.3 Patent and Competition Policy Must be Balanced

The FTC Report found that an appropriate balance between competition and patent policy will promote a greater degree of innovation. Errors or systematic biases in how one policy's rules are interpreted and applied can harm the other policy's effectiveness.

When a patent confers market power, it provides its owner with the ability to restrict production or charge prices that would be lower in the absence of a patent. To the extent that the promise of patent protection is necessary to stimulate invention, these static effects are necessary to promote dynamic efficiency. If the promise of patent protection is not necessary for those purposes, however, then the reduced output or higher prices are inefficient. For that reason, an important goal of the patent system is to provide a "means of weeding out those inventions which would not be disclosed or devised but for the inducement of a patent."[16]

The FTC Report found that patents that are invalid or have overly broad, unclear claims can impair competition, innovation and the economy. They present a significant concern because they can cause unwarranted market power, unjustifiably increase costs, and hamper competition that otherwise would stimulate innovation. For instance, such patents deter innovation if they lead the patentee's competitor to forgo R&D in areas that the patent improperly covers. Allowing patents on obvious inventions can thwart competition that might have developed based on the obvious technology. Expensive and time-consuming

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12 FTC Report, Ch. 3 at 12-15; see generally Schumpeter, supra n. 3.

13 FTC Report, Ch. 3 at 31-32. See, e.g., FTC/DOJ Hearings on Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy, Robert Barr Testimony, Feb. 28, 2002, at pages 673-74 (hereinafter, citations to transcripts of these hearings state the speaker's last name, the date of testimony, and relevant page(s)) ("[Cisco System's] growth was obviously not fuelled by patents, it was fuelled by competition and by open, non-proprietary interfaces."); Rhoden 2/28 at 754 ("[C]ompetition is what drives . . . innovation; patents have almost nothing to do with innovation."); Zanfagna 3/20 at 90 ("[I]nnovation is driven by competition in all of our markets."); Detkin 2/28 at 751 ("[T]he clear driving force behind innovation is competition.").

14 FTC Report, Ch. 3 at 31 (citing W.M. Cohen et al., Protecting Their Intellectual Assets: Appropriability Conditions and Why US Manufacturing Firms Patent (Or Not), National Bureau of Econ. Research Working Paper No. 7552, 2000, available at http://papersdev.nber.org/papers/27552).

15 FTC Report, Ch. 3 at 46. Kohn 2/27 at 350 ("[I]nnovation generally is promoted by competition."); see also, Chaikovsky 2/27 at 385; Friedman 2/27 at 354; Musacchia 4/9 at 44-45; Stallman 4/9 at 17-18. Competition also plays a key role in pharmaceutical innovation, in that the competition spurred by entry of a generic drug product (usually, after a pioneering patent expires) has forced brand-name firms to invent with new products to replenish their revenue streams. FTC Report, Ch. 3 at 11 (citing Glover 3/19 at 146).

16 Graham v. John Deere Co., 383 US 1, 11 (1966).

patent litigation to challenge a patent on an obvious technology wastes resources. If a competitor chooses instead to negotiate a license and pay royalties to avoid that costly and unpredictable litigation, the costs of follow-on innovation and commercial development increase due to the unjustified royalties.[17] Moreover, such patents contribute to problems associated with "patent thickets,"[18] in which hundreds or even thousands of patents cover a single product. Firms spend resources obtaining "defensive patents," not to protect their own innovation, but to have "bargaining chips" to obtain access to others' patents through a cross-license or to counter allegations of infringement.[19]

Conversely, competition policy could undermine the innovation that the patent system promotes if oversealous antitrust enforcement were to restrict the procompetitive use of patent rights. Although the issues surrounding the proper application of antitrust law to intellectual property matters are vitally important to achieving a high level of innovation, this paper addresses them only briefly in deference to the questions presented in the request for papers. The DOJ and FTC will soon complete a joint report addressing these antitrust issues, based on the FTC/DOJ Hearings.

4. Role of Competition Authorities in Promoting Reforms within the Patent System

Competition authorities may approach the relationship between patent and competition policy from at least two directions. Of course, they must formulate and apply antitrust policy to patent matters in a manner that appreciates the patent system's incentives to innovate and addresses challenges to innovation, as discussed in Section 6 below. Additionally, they may promote reforms within the patent system that achieve a greater appreciation of economic and competition principles, as discussed in this section.

Competition authorities have a core competency in examining the effects of restraints, other conduct, and rules on consumer welfare, especially when this analysis is performed through empirical research and the use of economists. They have experience in an effects-based method of inquiry. They can play a meaningful role in advising patent policy makers on the impact of current laws on competition generally, and thus play a constructive role in promoting reforms within the patent system. To the extent that input

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17 Mark A. Lemley, Rational Ignorance at the Patent Office, 95 Nw. L. Rev. 1495, 1517 (2001) (noting that "patent owners might try to game the system by seeking to license even clearly bad patents for royalty payments small enough that licensees decide that it is not worth going to court"); Id. (royalties on improperly granted patents cause an inefficient allocation of society's resources and a transfer that "encourages patenting and discourages competition to a greater extent than is socially optimal."). An unjustified royalty may result in higher prices to consumers, inefficiently low use of the affected products, and deadweight loss. See Shapiro, Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting, in Innovation Policy and the Economy 119, 125 (Adam Jaffe et al. eds., 2001).

18 A "patent thicket" is a "dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialise new technology." Shapiro, supra note 17 at 120.

19 The FTC heard extensive testimony related to all of these problems at the hearings underlying its IP Report. Id. Exec. Summ. at 1-7; Ch. 2 at 7-8; Ch. 3 at 20-26, 33-41, 50-55; Ch. 4 at 5; Ch.5 at 2-4. In April 2004, the National Academies of Science issued a report, A Patent System for the 21st Century, (the NAS Report), which echoed several of the FTC recommendations and noted its similarities to the FTC IP Report. The NAS Report is available at http://www.nap.edu/html/patentsystem. The NAS Report concluded that poor quality patents can hinder innovation for many of the reasons also discussed in the FTC's IP Report. NAS Rpt. at 37-38, 95. It also recommended applying the obviousness standard more vigorously. Id. at 87-90.

from competition policy helps to improve the procompetitive effects, transparency, and predictability of the patent system itself, consumer welfare will benefit.[20]

However, competition authorities must appreciate that changes to the patent system should be approached with caution. This principle is particularly important in light of the observation that the pace of innovation in developed economies in the second half of the twentieth century and currently has been robust, by any measure, and has been a key driver of global expansion and improved living standards. While it is impossible to determine precisely the effect of the patent system on this state of affairs, the patent system must be seen as a part of a generally successful status quo.

The FTC Report proposed reforms within the patent system, as explained below, and the US antitrust agencies continue to play a role in policy and legislative debates within the patent system. Of particular note, the agencies frequently participate in the formulation of the government's *amicus curiae* (friend of the court) position briefs in Supreme Court cases involving intellectual property issues;[21] for example, they appeared on the United States' brief in *Illinois Tool Works Inc. v. Independent Ink, Inc.,*[22] together with counsel for the US Patent and Trademark Office, and successfully argued in an antitrust "patent tying" case that the mere fact that a tying product is patented does not support a presumption of market power in that product.[23]

4.1 The FTC Report

At the Hearings underlying the FTC Report, one issue stood out for the widespread agreement it generated among panellists: the importance of patent quality in maintaining a balance between patent and competition policy. Panellists extensively discussed patent quality and its fundamental determinants, such as the procedures through which patents are examined, re-examined, and litigated.[24] On that basis, the FTC Report made several recommendations aimed at improving patent quality, including:[25]

Provide Adequate Funding for the PTO. One major determinant of patent quality is the level of resources provided to fund the operations of the Patent and Trademark Office (PTO.) The examination of patent applications often requires highly specialised skills. Not only must the PTO recruit and retain skilled specialists, but the office also must afford examiners sufficient time to undertake a proper inquiry of the proposed invention and the prior art.

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20 Deborah Platt Majoras, A Government Perspective on IP and Antitrust Law, address at the American Antitrust Institute (Washington, D.C., June 21, 2006) available at http://www.ftc.gov/speeches/majoras/060621aai-ip.pdf.

21 Id.

22 Brief for the United States as Amicus Curiae, Illinois Tool Works Inc. v. Independent Ink, Inc., No 04-1329 (S. Ct.), 2005 WL 1864093 (Aug. 4, 2005).

23 See Illinois Tool Works Inc. v. Independent Ink, Inc., 126 S.Ct. 1281 (2006) (abrogating prior cases that were interpreted to require such a presumption).

24 FTC Report, Ch. 3 at 20-21.

25 See, e.g., FTC Report, Executive Summary at 7-14. Beyond those recommendations aimed at improving patent quality, the FTC Report made other recommendations, which aimed, for instance to improve the disclosure function of the patent system. See, e.g., id., Executive Summary at 16-17 (recommending changing the predicates for finding wilful infringement); id., Executive Summary at 15-16 (recommending that all patent applications be published 18 months after filing).

Implement Robust Pre-Issuance Examination Procedures. The Report recommended that the PTO establish procedures that allow examiners to request and obtain additional information from applicants concerning the prior art or the claimed invention. (The proposed PTO regulations described below generally fall into this category.)

Create a New Administrative Procedure for Post-Grant Review of Patents. The FTC Report found that existing means for challenging questionable patents are inadequate. Patent prosecution is *ex parte*, involving only the PTO and the patent applicant. Once a questionable patent has issued, the most effective way to challenge it is through litigation, but that path is extremely costly and lengthy, and normally is not an option unless the patent owner has threatened the potential challenger with patent infringement litigation. For these reasons, the FTC recommended institution of a meaningful post-grant review and opposition procedure.

Tighten Legal Standards Used to Evaluate Whether a Patent is "Obvious." US patent law precludes patenting if the differences between the claimed invention and the prior art are "obvious." Patents on obvious technology "hav[e no] social benefit[,] because . . . others would have developed the idea even without the incentive of a patent."[26] Because proper application of this statutory requirement is crucial to prevent the issuance of patents on trivial inventions that might unduly harm competition, the FTC Report recommends tightening certain legal standards used to evaluate whether a patent is obvious. One of those standards, the "suggestion test," is the subject of the *KSR* case currently before the US Supreme Court, as explained in section 5.1 below.

5. Recent Developments and Proposals for Changes to the Patent System in the US

All three branches of the US government – the judicial, the executive, and legislative – currently have under review cases or proposals for changes related to the patent system. Many of these proposals stem from the recognition that it is desirable to increase patent quality and to subject questionable patents to increased scrutiny. The US Supreme Court recently granted review of two cases that offer the potential substantially to change the patent system: *KSR v. Teleflex* and *MedImmune v. Genentech*; and it has decided one: *eBay v. MercExchange.* The PTO has issued for public comment a series of proposed rules modifying the procedures for patent examination and review. Finally, both houses of the Congress are considering legislation implementing changes to the patent system.

5.1 Supreme Court Litigation

KSR. In June of this year, the Supreme Court granted *certiorari* (announced its decision to review) the case *KSR v. Teleflex.*[27] *KSR* presents the question of when a patent should be denied or invalidated on the grounds that the claimed invention is "obvious" to a hypothetical person of ordinary skill in the pertinent art, in light of the content of the prior art and the inventive skill attributable to such a person.[28] At issue is whether the Federal Circuit – the intermediate appellate court with jurisdiction over almost all patent appeals in the US – improperly burdened the statutory analysis of obviousness by imposing its "suggestion" test. The suggestion test requires that a patent examiner seeking to reject a patent application, or a litigant seeking to invalidate a patent, make a specific demonstration of some "suggestion, teaching, or

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26 Merges & Duffy, Patent Law and Policy: Cases and Materials at 646.

27 KSR International Co. v. Teleflex, Inc. & Technology Holding Co., No. 04-1350 (S.Ct.).

28 35 USC. § 103 (A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.); Graham v. John Deere Co., 383 US 17-18 (1966) (setting forth a methodology for analysing obviousness).

motivation" that would have led a person of ordinary skill in the art to combine the prior art to create the claimed invention.[29] As the *KSR* case illustrates, application of the "suggestion test" often presents the dispositive issue in assessing whether a patent is obvious. The Supreme Court invited the US government's view on whether to take the case, and in 2006 the government filed a brief urging review.[30]

The government's brief reiterates that this case, and the questions that it raises concerning the proper standard for obviousness, has a substantial impact on commercial enterprise and innovation.[31] The FTC Report found that the economic consequences of patents that should be deemed obvious (and therefore invalid) can be significant, as explained in section 3.3 above. In line with these interests, the government's brief argues that the "suggestion" test is too restrictive because it places undue emphasis on finding explicit statements that provide a suggestion to combine existing elements into the claimed invention, while leaving little room for the possibility that "persons of ordinary skill in the art" could combine elements to solve a problem on their own initiative.[32] The test ignores other possible reasons for obviousness, such as the possibility that the solution to the problem may have been too obvious to bother to write down.[33] As such, it can permit patents on trivial inventions.

MedImmune. Also this year, the Supreme Court granted *certiorari* in *MedImmune, Inc. v. Genentech*.[34] This case presents the question of whether a patent licensee in good standing may bring a declaratory judgment action challenging the validity and scope of the licensed patent. The rule currently prevailing in the lower courts effectively precludes these suits.[35] The government filed an *amicus* brief in support these challenges and the case will be heard in the fall.

The government's brief argues that the court of appeals' rule requiring a reasonable apprehension of suit to establish standing in a patent declaratory judgment case is an overly rigid interpretation of the US Constitutional requirements.[36] Instead, the government urges the Court to apply the traditional flexible, fact-based approach of whether an "actual controversy" exists: that is, whether there is a substantial controversy, between parties with adverse interests, of sufficient immediacy and reality to warrant the

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29 See, e.g. Tec Air, Inc. v. Denso Mfg. Mich. Inc., 192 F.3d 1353, 1359-60 (Fed. Cir. 1999); In re Rouffet, 149 F.3d 1350, 1357 (Fed. Cir. 1998) (reversing PTO conclusion that patent was obvious after finding no suggestion to combine references, even though the collective references contained all elements of the claims).

30 Brief for the United States as Amicus Curiae Supporting Petitioner, KSR International Co. v. Teleflex, Inc. & Technology Holding Co., No. 04-1350 (S. Ct. Aug. 22, 2006) ("KSR merits brief"); see also Brief for the United States as Amicus Curiae, KSR International Co., No. 04-1350 (S. Ct. May 25, 2006), 2006 WL 1455388 ("KSR cert. brief").

31 KSR merits brief at 2, 25; KSR cert. brief at *18-19.

32 KSR merits brief at 10, 16-23; KSR cert. brief at *9-10. Similarly, the FTC Report stressed the importance of ascribing "an ability to combine or modify prior art references that is consistent with the creativity and problem-solving skills that in fact are characteristic of those having ordinary skill in the art." FTC Report, Ch. 4 at 15.

33 KSR merits brief at 19; KSR cert. brief at *14.

34 Medlmmune, Inc. v. Genentech, Inc., No. 05-608 (S.Ct.).

35 See, e.g., Gen-Probe Inc. v. Vysis, Inc., 359 F.3d 13767, cert. dismissed, 543 US 941 (2004).

36 Brief of the United States as Amicus Curiae Supporting Petitioner, MedImmune, Inc. v. Genentech, Inc., No. 05-608 (S.Ct. May 15, 2006), 2006 WL 1327303, *14-19.

issuance of a declaratory judgment. Applying this test, the brief argues that a licensee need not breach the agreement in order to present a justiciable controversy concerning a patent's validity and scope.[37]

As the government's brief explains, given the harm that invalid patents can inflict on competition and consumers, there is a strong public interest in ensuring that invalid patents may be challenged to the full extent permitted by the Constitution. Licensees are typically the only entities with enough knowledge and economic incentive to challenge invalid patents, but they may be unwilling to risk breaching the license for fear of an injunction and the threat of treble damages (which can be awarded for "wilful" patent infringement). As the brief explains, a rigid rule that denies licensees standing to challenge patents, absent breach, encourages continued royalty payments for patents that otherwise might be held invalid, which may be economically inefficient.[38]

eBay. In *eBay, Inc. v. MercExchange LLC*,[39] the Supreme Court held patent holders seeking permanent injunctions against patent infringers are required to satisfy the traditional four-factor test applied by courts of equity granting injunctive relief. The four-factor test requires a plaintiff to show that (1) it suffered an irreparable injury; (2) money damages are inadequate to compensate for that injury; (3) the "balance of hardships" favours the plaintiff, meaning that the hardship caused to the plaintiff by denying an injunction is greater than the hardship caused to the defendant by granting one; and (4) the public interest would not be disserved by a permanent injunction.[40] The United States government filed an *amicus* brief arguing that a permanent injunction should not be an automatic remedy for patent infringement. Because the US Patent Act requires that injunctions in patent cases be awarded "in accordance with the principles of equity,"[41] the brief advocated application of the four-factor equitable test, but also noted that an evaluation of the equities typically will support granting an injunction against a patent infringer.[42] The Court agreed.

eBay operates an Internet site providing online auctions, among other services. MercExchange owns a patent on a business method for creating an electronic market that facilitates sales between private entities. MercExchange sued eBay for patent infringement, and the trial court found the patent valid and infringed; the court, however, after applying the four-factor equitable test, denied MercExchange's motion for a permanent injunction.[43] The US Court of Appeals for the Federal Circuit reversed in a short opinion, applying its "general rule that courts will issue permanent injunctions against patent infringement absent exceptional circumstances."[44] The Supreme Court then granted *certiorari* to consider this "general rule."[45]

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37 Id. at *11, 19-23.

38 Id. at *23-26.

39 eBay, Inc v. MercExchange LLC, 126 S.Ct. 1837 (2006).

40 Id. at 1839.

41 35 USC. § 283.

42 Brief for the United States as Amicus Curiae Supporting Respondent, eBay Inc. v. MercExchange, L.L.C., No. 05-130 (S Ct. March 10, 2006), 2006 WL 622120, *22-23. The government's brief also argued, however, that when a non-practicing entity is able to use the threat of an injunction as leverage to extract a greater royalty that the value of the invention would mandate because of the infringers sunk costs, a court might properly conclude that injunctive relief is inappropriate. Id. at *2.

43 MercExchange, LLC v. eBay, Inc., 275 F. Supp.2d 695, 714-15 (E.D. Va. 2003).

44 MercExchange, LLC v. eBay, Inc., 401 F.3d 1323, 1339 (Fed. Cir. 2005).

45 eBay, Inc., 126 S.Ct. at 1839.

In a unanimous opinion, the Supreme Court acknowledged that the Patent Act provides patent holders with the right to exclude others from "making, using, . . . or selling" the patented invention.[46] The Court, however, rejected the argument that this right alone justifies an "automatic" permanent injunction in favour of patentees. In so doing, the Court criticised a long-standing practice in the lower courts to issue such injunctions against patent infringers as a matter of course.[47] The Court also criticised the ruling of the trial court, stating that traditional equitable principles would not support "broad classifications" denying injunctive relief merely because a patentee exhibited "willingness to license its patents," or had a "lack of commercial activity in practicing the patents."[48] The Court then vacated and remanded the case for a more thorough consideration of an injunction under the four-factor test. The full Court provided no further guidance as to when an injunction is appropriate following a finding of patent infringement.

Seven of the nine justices, however, joined separate concurring opinions to discuss the matter further. While these concurrences do not have the force of law, they suggest areas for possible development by subsequent cases in the Supreme Court and lower courts.

A three-Justice concurrence, written by the Chief Justice, emphasised that while the Court's decision reaffirmed the four-factor test and with it a trial court's discretion to deny injunctions, there is a "long tradition" of courts granting injunctive relief upon a finding of infringement in the vast majority of patent cases.[49] These Justices emphasised that when applying the four factors, "a page of history is worth a volume of logic,"[50] which, in the context of the opinion, could be read as a caution to lower courts against frequent denials of permanent injunctions.

A four-Justice concurrence employed a slightly different emphasis, suggesting that competitive considerations may bear upon whether to grant an injunction. Referring to the FTC Report, these Justices noted that an industry has developed in which non-practicing entities (entities that do not commercialise products other than technology licenses) use patents not as a basis for producing goods but for obtaining license fees.[51] The Justices noted that for these firms, an injunction can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent. The Justices stated that "when the patented invention is but a small component of the product the companies seek to produce and the threat of an injunction is employed simply for undue leverage in negotiations, legal damages may well be sufficient to compensate for the infringement and an injunction may not serve the public interest."[52]

5.2 Administrative Activity by the Patent and Trademark Office

During 2006, the Patent and Trademark Office (PTO) published four sets of proposed regulations and procedures intended to improve the quality and efficiency of the patent examination process in the US, and to promote innovation and economic growth. These new regulations and procedures in some cases would increase the quality of information that patent applicants are required to provide to patent examiners, and, in others, seek to focus applicants on initially presenting their best claims and arguments. These proposed changes are as follows:

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46 Id. at 1840; 35 USC. § 154(a)(1).

47 eBay, Inc., 126 S.Ct. at 1839.

48 Id.

49 Id. at 1841-42 (Roberts, C.J., and Scalia, J. and Ginsberg, J., concurring).

50 Id. at 1842.

51 Id. at 1842 (Kennedy, J., Stevens, J., Souter, J., and Breyer, J., concurring).

52 Id.

Requesting More Timely and Useful "Information Disclosure Statements." The proposed rule requires patent applicants under certain circumstances to identify the most relevant information in the prior art related to their inventions in the early stages of the patent examination.[53]

Offering Accelerated Examination in Exchange for More Focused Applications. The proposed procedure allows applicants to file a request to receive within 12 months a final decision by an examiner on whether their applications for patents will be denied or granted. In exchange, the applicants must provide and explain the prior art, and state in specific ways why the claimed inventions are patentable.[54]

Focusing Initial Patent Examination on Representative Claims. The regulation would limit initial examination to ten representative patent claims. If more than ten representative claims are to be examined, the applicants would be required, among other things, to describe the prior art, and to state in specific ways why the claimed inventions are patentable.[55]

Limiting Repetitive Continuation Applications. Continued examination allows applicants to obtain further examination of a patent application after a "final rejection" by the examiner. These procedures sometimes lead to an unlimited string of filings with diminishingly useful communications between the patent examiner and the applicant. The proposed regulations limit proceedings in the PTO by requiring applicants, after they have received two full rounds of examiner review, to show why any new continuation submissions could not have been made previously.[56]

5.3 Legislative Activity

Three bills have been introduced in the United States House of Representatives and the United State Senate in the past two years proposing far-reaching reforms to the patent system.[57] Some provisions of the legislation incorporate aspects of recommendations made by the FTC Report. While the bills differ in scope and in the details of their implementation, they share several features. Among other things, the bills would establish a post-grant opposition procedure; change the standards for wilful infringement; and permit third parties to submit prior art during patent examination.[58]

Post-Grant Patent Review. All three bills create an expanded post-grant opposition procedure with many of the features the FTC Report recommended. The bills allow the public to dispute all issues of

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53 Changes to Information Disclosure Statement Requirements and Other Related Matters, 71 Fed. Reg. 38808 (10 July 2006).

54 Changes to Practice for Petitions in Patent Applications to Make Special and for Accelerated Examination, 71 Fed. Reg. 36323, 36323-24 (26 June 2006).

55 Changes to Practice for the Examination of Claims in Patent Applications, 71 Fed. Reg. 61 (Jan. 3, 2006).

56 Changes to Practice for Continuing Applications, Requests for Continued Examination Practice, and Applications Containing Patentably Indistinct Claims, 71 Fed. Reg. 48, 48-49 (Jan. 2, 2006).

57 Representative Lamar Smith, Chairman of the House Subcommittee on Courts, the Internet and Intellectual Property, introduced legislation entitled the "Patent Reform Act of 2005," on June 8, 2005. Patent Reform Act of 2005, H.R. 2795, 109th Cong. (2005). Later that term, Representative Howard Berman, Ranking Member of the House Judiciary Subcommittee on Courts, the Internet and Intellectual Property, introduced legislation entitled the "Patents Depend on Quality Act." H.R. 5096, 109th Cong. (2006). Finally, on August 3, 2006, Senators Orrin Hatch and Patrick Leahy, chairmen of the US Senate's intellectual-property panel, introduced a Senate bill on patent reform.57 Patent Reform Act of 2006, S3818, 110th Cong. (2006).

58 Each bill also contains other provisions not discussed here.

patentability before a board of administrative judges within the PTO based on limited discovery. Either party wishing to oppose the decision retains full rights of appeal.

Limiting Wilful Infringement. The three bills also establish new predicates for wilful infringement. Specifically, they limit findings of wilful infringement to those circumstances in which (i) the infringer continued to infringe after receiving specific written notice of infringement, (ii) the infringer intentionally copied the infringing device or process, or (iii) after having been found by a court to have infringed the patent, the infringer engaged in conduct that was not colorably different from the conduct previously found to have infringed the patent.

Third Party Submission of Prior Art. The bills permit third parties to submit prior art to the PTO during patent examination. They typically provide that the party that submits the reference must explain the relevance of the reference and pay a fee to defray PTO expenses and discourage frivolous submissions. This provision is intended to improve the quality of patents by giving examiners greater access to prior art when deciding patentability.

At this stage, it is too early to know which legislative proposals, if any, will be implemented. Debate and additional bills are likely to follow, and it is thus too early to predict the effects of the legislation on innovation.

6. Considerations when Formulating Antitrust Policy Involving Patent and Innovation Issues

In economies increasingly based on high technology, competition authorities must frequently formulate and apply antitrust policy to matters involving patent and innovation issues. It is important that they do so in a manner that remains sensitive to the patent system's incentives to innovate and recognises challenges to innovation in order to give full weight to the dynamic efficiencies that have great potential to increase consumer welfare.

Firms making investment decisions seek clear, predictable rules as to how the patent and competition regimes will function together. Uncertainty can deter investment. Senior officials of the US Department of Justice have observed that the search for the perfect can be the enemy of the good, and that while competition experts may find the most intricate balancing tests to be the most interesting, "[b]usiness does not run this way."[59] To the extent that competition enforcement is seen as a way to second-guess or address flaws within the patent system, it likely will create undesirable uncertainty. For that reason and others, antitrust law is not an appropriate tool for correcting errors in the patent system.

When formulating antitrust policy, competition authorities operate on firmest ground when they react to particular challenges within the patent system where anticompetitive effects are clear and solutions are administrable. This Section discusses examples of instances when competition policy has successfully addressed challenges to innovation in a manner that promotes innovation, such as the business reviews of patent pooling arrangements and passage of the Standards Development Organisation Advancement Act, and agency analysis of recent mergers. This Section also discusses a current effort regarding *ex ante* discussions of licensing terms within standards development organisations.

[59] See Masoudi, supra n. 2, at 3.

6.1 Patent Pool Business Review Letters

The US antitrust agencies analysed patent pools generally as part of their 1995 *Antitrust-IP Guidelines*.[60] The Department of Justice provided more specific guidance in its review of three proposed pools: the video compression technology proposal (MPEG-2); the three-company DVD proposal (3C DVD); and the six-company DVD proposal (6C DVD).[61] Together, these letters established a predictable method for creating patent pools that are unlikely to be challenged as anticompetitive under US antitrust laws.

Patent pools have a number of procompetitive justifications. They can eliminate the problem of multiple blocking positions (defined as a situation where two or more patent holders can each block a product in the absence of a license from both); reduce transaction costs, since a licensee will find it more efficient to negotiate with a single pool licensor than with the pool's multiple patent holders; distribute risks by increasing the chances that an innovator will receive at least some compensation for its invention, if it can persuade other patent holders to include the new patent in the pool; and provide an efficient mechanism for sharing useful non-patented information such as manufacturing secrets and medical dosing. Such pools also carry risks of anticompetitive effects, including the potential to exclude or inadequately compensate new innovation, thereby entrenching a dominant technology; reduce competition by combining patents that otherwise would compete for licensees; reduce a potential licensee's incentives to challenge invalid patents; or provide a forum for price fixing, collusion, and classic cartel behaviour.

The patent pool business review letters together provided a list of factors, not necessarily exclusive or required in every case, that could lessen the chances of anticompetitive effects and therefore challenge under antitrust laws. These included, among others: limiting pools to complements, and avoiding substitutes; using nonexclusive, non-discriminatory licensing; imposing safeguards against downstream coordination; limiting the scope of mandatory grant backs; and clarifying which patents are in the pool. Patent pooling has flourished under these guidelines in recent years and, with the exception of one case in which the FTC found a two-patentee pooling arrangement to be essentially a cover for price fixing regarding substitute patents,[62] the US antitrust agencies have not found it necessary to litigate against patent pools. Pools have developed as a procompetitive way to deal with patent thickets, and competition policy has encouraged that development.

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60 US Dep't of Justice & Federal Trade Comm'n, Antitrust Guidelines for the Licensing of Intellectual Property § 5.5 (Apr. 6, 1995), at http://www.usdoj.gov/atr/public/guidelines/ipguide.htm.

61 Letter from Joel I. Klein, Acting Assistant Attorney General, US Dep't of Justice, to G[a]rrard R. Beeney, Esq. (June 26, 1997), at http://www.usdoj.gov/atr/public/busreview/1170.wpd (MPEG-2 Business Review Letter); Letter from Joel I. Klein, Assistant Attorney General, US Dep't of Justice, to Garrard R. Beeney, Esq. (Dec. 16, 1998), at http://www.usdoj.gov/atr/public/busreview/2121.wpd (3C DVD Business Review Letter); Letter from Joel I. Klein, Assistant Attorney General, US Dep't of Justice, to Carey R. Ramos, Esq. (June 10, 1999), at http://www.usdoj.gov/atr/public/busreview/2485.pdf (6C DVD Business Review Letter). See also Letter from Charles A. James, Assistant Attorney General, US Dep't of Justice, to Ky P. Ewing, Esq. (Nov. 12, 2002), at http://www.usdoj.gov/atr/public/busreview/200455.pdf regarding "third-generation" ("3G") wireless communication technologies.

62 Complaint, In re Summit Tech., Inc. and VISX, Inc., No. 9286 (FTC filed Mar. 24, 1998), available at http://www.ftc.gov/os/1998/03/summit.cmp.htm [hereinafter FTC Summit-VISX Complaint]; In re Summit Tech., Inc. and VISX, Inc., No. 9286 (FTC Feb. 23, 1999), Decisions and Orders, available at http://www.ftc.gov/os/1999/03/d09286visx.do.htm.

6.2 Limited Safe Harbour for Standards Development Organisations

The development of technology interoperability standards, when conducted in a procompetitive fashion, has been a significant factor in the growth of technology markets. Joint standard setting can reduce inefficiencies caused by incompatible devices, encourage combined best-of-breed solutions rather than solutions tied to only the technology of a single firm, and help participants to clear patent thickets.[63]

Standards development organisations (SDOs) often involve collaborations among competitors. While standards development is generally procompetitive, the potential for anticompetitive collaboration within SDOs exists. In recent years, the SDOs themselves – which are usually run as volunteer or non-profit enterprises – have expressed concern that their employees could be sued for treble damages under US antitrust law, and that the threat of such liability could hamper procompetitive standards development efforts by reducing the willingness of talented people to run SDOs.

The US antitrust agencies believe that the fear of significant liability for SDOs themselves (as opposed to members who might conspire) is largely unfounded; nevertheless, they acknowledge that competition could be harmed if qualified personnel refuse to staff SDOs due to fear of liability. The agencies worked with SDOs and the Congress to narrowly tailor a law to address this fear, while keeping intact the possibility of antitrust liability for SDO members who use standard setting as a cover for anticompetitive conduct. On June 22, 2004, the President signed into law the Standards Development Organisation Advancement Act.[64] The Act grants SDOs (although not standard setting participants) limited immunity from treble damages in antitrust actions on the condition that the SDOs file proper notification of their activities with the agencies.[65] The agencies later issued guidance on the filing requirements, stating, among other things, that SDOs should file documents showing the nature and scope of the standards development activity.[66] SDOs have taken advantage of this program in large numbers and appear to believe that the Act has allayed their fears.

6.3 Ex Ante Licensing Negotiations in SDOs

Standards development organisations typically require that their members agree to license any technology contributed to the standard on a "reasonable and non-discriminatory" (RAND) basis. Problems sometime arise when a standard effectively creates market power for a patentee, and the patentee and its licensees disagree over what price would be reasonable. A solution to this type of *ex post* negotiation, which is prone to patent hold-up, is *ex ante* negotiation. However, SDOs and their members have been reluctant to engage in *ex ante* discussions of technology licensing structures and rates, in part due to a fear of antitrust liability under a monopsony theory: theoretically, a plaintiff could claim that by engaging in *ex ante* negotiations, potential licensees would drive technology fees below competitive levels and thereby damage innovation incentives.

The US antitrust agencies have clarified their policies toward *ex ante* licensing through a series of public statements. Hewitt Pate, former Assistant Attorney General for Antitrust, addressed this issue in 2005 and concluded that a rule of reason analysis was appropriate, balancing the monopsony concern

63 FTC Report, Ch. 3 at 43.

64 P.L. 108-237 (June 22, 2004), codified as amendments to 15 USC. §§ 4301-05.

65 15 USC. § 4303 (as amended).

66 Federal Trade Commission, Notice on Implementation of the Standards Development Organisation Advancement Act of 2004 (June 24, 2004), www.ftc.gov/opa/2004/06/sdoaa.htm.

against the inefficiencies of *ex post* negotiations and licensing hold up.[67] He noted that "[i]t would be a strange result if antitrust policy is being used to prevent price competition."[68] More recently, in an address devoted to the subject, FTC Chairman Majoras stated that "joint *ex ante* royalty discussions that are reasonably necessary to avoid hold up do not warrant *per se* condemnation. Rather, they merit the balancing undertaken in a rule of reason review."[69]

The threat of monopsony effects from *ex ante* SDO licensing negotiations, while possible, is unlikely to be a frequent practical concern. Factors such as SDO members' pre-standard lack of buying power, SDO members' status as potential licensors, and the possibility that low rates will reduce the widespread participation necessary for an SDO effort, should temper the ability or desire to drive royalty rates below competitive levels.[70] The agencies have expressed their willingness to issue business reviews on appropriate SDO plans in this regard.

6.4 Mergers

The US antitrust agencies also attempt to promote innovation through competition policy in the merger review process. Many of the mergers that the agencies review reflect the increased importance of intellectual property in twenty-first century markets. In evaluating mergers in technology-intensive or R&D-intensive industries, the agencies apply their joint 1992 Horizontal Merger Guidelines, as they do in more traditional industries. These Guidelines specifically recognise that a reduction in innovation is one of the ways in which a seller with market power may lessen competition.[71] While merger analysis is by its nature forward-looking and predictive, the agencies avoid undue speculation regarding the likely ways in which technology ultimately will be developed and marketed, given the unpredictability of research and the speed at which new development potentially can shift dynamic markets.

Two recent matters provide examples of how merger analysis can respond to concerns about innovation. First, the FTC in 2004 decided by a divided vote to close its investigation of the consummated merger of Genzyme Corp. and Novazyme Corp., the only two companies developing therapies for a rare disorder known as Pompe disease.[72] The FTC's investigation focused on the transaction's potential impact on the pace and scope of research into the development of a treatment for Pompe disease.

In his statement, then-Chairman Muris explained his conclusion that, based on the facts of the case, the transaction did not appear likely to reduce the incentives of the merged firm to invest in successful

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67 R. Hewitt Pate, Competition and Intellectual Property in the US: Licensing Freedom and the Limits of Antitrust, address at the EU Competition Workshop (June 3, 2005) 9-10, http://www.usdoj.gov/atr/public/speeches/209359.pdf.

68 Id. at 9.

69 Deborah Platt Majoras, Recognising the Procompetitive Potential of Royalty Discussions in Standard Setting, address at the forum on Standardisation and the Law (Stanford University, Sept. 23, 2005) 7, available at http://www.ftc.gov/speeches/majoras/050923stanford.pdf.

70 Id. at 9.

71 United States Dep't of Justice and Federal Trade Commission, Horizontal Merger Guidelines (Apr. 2, 1992), reprinted in 4 Trade Reg. Rep (CCH) ¶ 13,104 at § 0.1, n. 6.

72 File No. 021 0026, Closing of Investigation of Genzyme Corporation Acquisition of Novazyme Pharmaceuticals, Inc. (Jan. 14, 2004), available at http://www.ftc.gov/opa/2004/01/genzyme.htm. The Commission vote to close the investigation and to issue separate public statements was 3-1-1, with Commissioner Mozelle W. Thompson dissenting and Commissioner Pamela Jones Harbour not participating. Chairman Muris and Commissioner Harbour each filed separate written Statements, and Commissioner Thompson filed a dissent.

research and development, and that the transaction was more likely to produce efficiencies that could accelerate development of a life-saving treatment.[73] He determined that competition between the two entities would not have had a substantial effect on the amount or timing of either of their R&D spending on Pompe, or on when either of their therapies would reach the market.[74] Among other factors, then-Chairman Muris found it significant that during the two years since the merger had been consummated, Genzyme had not slowed its Pompe program.[75]

In another recent transaction, the FTC required a licensing remedy to preserve ongoing development of new drug therapies. In 2002, the FTC reviewed the merger of Amgen and Immunex. At issue were two markets for drugs used primarily to treat rheumatoid arthritis, as well as research and development into related new drug therapies. In both markets, the merger joined the dominant or only firm in the market with one of a very small number of serious would-be entrants. In each market, the consent order restored competition lost to the merger by requiring the merged firm to license key patents to a third party that had a product in clinical trials but that was allegedly blocked by the patents from entering. The license assured the third party that it had the freedom of operation necessary to market its competing product, and it allowed the merged firm to retain the rights needed to pursue development of its own competing products and new therapies.[76]

73 Statement of Chairman Timothy J. Muris in the matter of Genzyme Corporation / Novazyme Pharmaceuticals, Inc. (Jan. 14, 2004), available at http://www.ftc.gov/os/2004/01/murisgenzymestmt.pdf.

74 Id. at 12-15.

75 Id. at 14-17.

76 In re Amgen/Immunex, FTC Docket No. C-4053, Analysis to Aid Public Comment at 2-3, available at www.ftc.gov/os/caselist/c4056l.htm; Complaint, at 5-6, available at http://www.ftc.gov/os/caselist/c4056.htm.

EUROPEAN COMMISSION

1. Introduction

The topic of competition and innovation and the issues linked to it are at the heart of the European Commission's Lisbon Agenda for Jobs and Growth[1]. R&D and innovation are key drivers of productivity in advanced economies to ensure competitiveness at global scale. The European economy is presently characterised by under-investment in R&D (the EU is currently only spending 2% of total GDP in R&D). The Commission's strategies and reflections are therefore targeting the issue under what conditions companies invest more in R&D leading to innovation and economic growth. The Lisbon Agenda contains a number of building blocks aimed at strengthening European R&D and innovation and transforming that research into commercial products, to improve Europe's competitiveness.

The recent OECD report "Going for Growth" (2006)[2] in its part II assesses the effectiveness of the various measures applied by OECD countries to foster innovation. While it is commonly accepted that the market should drive this process, governments and government agencies (including the European Commission) have an important role in supporting and facilitating it. Government measures discussed in the report range from direct or indirect financial support for R&D projects to stricter protection of intellectual property. The report finds that all these forms of government intervention entail costs that must be weighed against their benefits. The basic conclusion drawn by the authors is that policy makers in order to maximise successful innovation at the lowest cost have to carefully consider the combined impact of their policies.

The approach taken in the 2006 OECD report is very much in line with the one taken by the European Commission: that innovation is best pursued within a system of innovation, i.e. the economic, social, political, organisational, institutional and other factors that influence the development, diffusion and use of innovation[3]. In this spirit and in order to boost innovation in the EU, the European Commission has in the past years embraced the view that a coordinated strategy was needed, based on a series of complementary policies[4].

Competition policy has an important role to play in this strategy. On the one hand, competition advocacy activities are destined at improving the regulatory environment in which companies operate, including IPR law. On the other hand, competition law enforcement ensures the protection of the competitive process to ensure efficient outcomes for consumers. In short, a sound regulatory regime

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1 See Communication to the Spring European Council of 2 February 2005 "Working together for Growth and Jobs"; at http://ec.europa.eu/growthandjobs/pdf/COM2005_024_en.pdf

2 See OECD - Economic Policy Reforms: "Going for Growth"; of 9th February 2006; by Jean Philippe Cotis; at: http://www.oecdwash.org/PDFILES/gfg2006_cotis_washington.pdf#search=%22OECD%202006%20Going%20for%20Growth%22

3 See e.g. Edquist, C. (2005) Systems of innovation, perspectives and challenges. In The Oxford Handbook of Innovation, Fagerberg, Mowery and Nelson (eds)

4 See e.g. Innovation policy: updating the Union's approach in the context of the Lisbon strategy (COM(2003) 112 final of 11.3.2003)

applied to patents and IPRs at large and an effective competition policy are two necessary and complimentary components of a policy strategy aimed at promoting innovation, growth and consumer welfare.

Over the past two decades we have seen a constant strengthening of patent regimes world-wide, with expanding coverage, new products and broader patent scopes, lower fees, etc. The 2004 OECD report ("Patents, Innovation and Economic Performance") states that pro-patent policies have been put in place without much regard to their effects on competition or the diffusion of knowledge, which are important questions and deserve further research. Competition agencies have to prepare themselves to tackle the competition issues which may arise from these trends and address them appropriately through their enforcement and advocacy activities.

This paper starts by briefly discussing the relationship between competition, innovation and IP rights (section 2) and goes on by giving a short overview on the recent developments in EC legislative and enforcement practice (antitrust, merger control, state aid and advocacy) with regard to innovation and the specific characteristics of innovative markets (section 3). Section 4 shortly depicts the main initiatives which will flow from the recently adopted Commission Communication on a Broad Based Innovation Strategy. Conclusions are summarised in section 5.

2. The relationship between competition, IP law, competition policy and innovation

2.1 Competition and Innovation[5]

Competition usually induces companies in a market with a given technology to offer the best products at the lowest prices. However, it is innovation which causes product markets to change as improved products and production processes are introduced, leading to greater consumer satisfaction and lower production costs. It is also a generally accepted and well substantiated point of view that innovation is the main source of increases in economic welfare. The literature shows that technological innovation, together with an increased ability on the part of the labour force, are main driving forces behind productivity gains and welfare growth.[6] Consequently, societies in general try to spur the creation and dissemination of innovation. In case of a choice between dynamic and static efficiencies, the former will quickly outweigh the latter.

This has led to the question whether innovation instead of price competition should be the focal point of competition policy and, if so, whether this should lead to a drastic revision of competition policy. This question goes to the heart of competition policy and questions its general validity when applied to markets for new and existing products. The assumption is that there may be a contradiction between innovation and (price) competition, or at least that by focusing on the preservation of (price) competition the rate of innovation may be harmed. Underlying this assumption is the view that (high) concentration may have a positive influence on the rate of technological progress.

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5 This section is in good part based on a chapter of Luc Peeperkorn and Vincent Verouden, The Economics of Competition, in The EC Law of Competition, edited by Jonathan Faull and Ali Nikpay, Oxford University Press, forthcoming.

6 See FM Scherer and D Ross, Industrial Market Structure and Economic Performance (3d edn, Boston: Houghton Mifflin Company, 1990), Ch 17; RM Solow, 'Technical Change and the Aggregate Production Function' (1957) Review of Economics and Statistics 312-320; WK Tom, Background Note, pp 21-22, Roundtable on Competition Policy and Intellectual Property Rights, Committee on Competition Law and Policy, OECD, October 1997.

There is no clear agreement in the economic literature concerning the benefit of competition for innovation and hence dynamic efficiency. There are economists who, in the footsteps of Schumpeter, claim that innovation is spurred by monopoly.[7] Monopoly profits may fund research and development (R&D) and a high market share may help to appropriate the value of the resulting innovations. The "Schumpeterians" argue that there is a conceptual flaw in competition policy. Competition policy, by attacking monopoly and preventing market power from arising, may have a positive effect on static allocative efficiency but at the same time undermines dynamic efficiency. As the latter is much more important for welfare growth it is argued that competition policy easily leads to unwanted policy results, i.e. less growth and less welfare.

The Schumpeterian view has been contradicted by Arrow[8] and also by other economists, who have put forward a number of reasons why competition may provide more incentives for innovation than monopoly. A firm under competitive pressure will be less complacent and will have more market share to gain through innovation. In addition, in the case of a product invention the new product will not cannibalise the firm's own market as it would under monopoly. It is also argued that innovation incentives depend not so much on the post-innovation profits *per se*, but on the difference between post-innovation and pre-innovation profits. The direct effect on welfare is also supposed to be better under competition, especially in the case of a process invention, as the innovation will be applied to a higher output than under monopoly.[9] Greater product market competition and a strict competition policy both work as an effective stick to foster innovative effort.[10]

Empirical research on the relationship between market structure and innovation, usually the litmus test in case of theoretical controversy, does not give unequivocal results but tends to support the view of Arrow. In general competition and open markets provide better incentives for innovation while monopoly and high concentration retard innovation.[11] There are some indications of an inverted U relationship between concentration and the ratio of industry R&D to industry sales, with the highest R&D/sales ratios occurring where the four biggest companies in the industry sell 50 to 60 per cent of total industry sales.[12] However, it is also clear that other factors such as the technological opportunity of the sector are more important to explain R&D intensity. Using data for the UK and controlling for technological opportunity Geroski found higher seller concentration and increases in other monopoly related variables to have a significant negative impact on the emergence of innovations.[13] In a study analysing reports in specialised technical literature covering the entire manufacturing sector, Acs and Andretsch found that the average small-firm innovation rate is higher than the large-firm innovation rate.[14] Other research points to the very

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7 J A Schumpeter, Capitalism, Socialism and Democracy, 1942.

8 K J Arrow, 'Economic Welfare and the Allocation of Resources for Invention'[1962] The rate and Direction of Inventive Activity: Economic and Social Factors609-625.

9 Static welfare analysis indicates that industry output is higher under competition than under monopoly. See section C.

10 P Aghion, N Bloom, R Blundell, R Griffith and P Howitt, 'Competition and Innovation: An Inverted-U Relationship' (2005) 120 Quarterly Journal of Economics 701; S Martin, 'Competition Policy for High Technology Industries@ [2001] Journal of Industry, Competition and Trade441-465.

11 See Scherer and Ross, Ch 17; and Tom, p22 (n 54).

12 P Aghion, N Bloom, R Blundell, R Griffith, P Howitt, Competition and Innovation: An Inverted U Relationship, The Institute for Fiscal Studies, WP02/04, February 2002.

13 P Geroski, 'Innovation, Technological Opportunity, and Market Structure'[1990] Oxford Economic Papers 42. See also Scherer and Ross, Ch 17.

14 ZJ Acs and DB Andretsch, 'Innovation, Market Structure and Firm Size' (1987) LXIX Review of Economics and Statistics 567-574.

important role of newcomers, especially where the invention of radically new products and concepts is concerned, and to the related interest in keeping entry barriers at modest levels. Lastly, it should be noted that research into the relationship between market structure and innovation is complicated by the fact that to a certain extent both are endogenous: both depend on more basic factors such as technological opportunities for innovation and demand conditions.

Also the results of the recent OECD Report "Going for Growth" (2006), on the relationship between competition restraining regulation and its effect on innovation, provide strong evidence that competition spurs innovation. It shows that anti-competitive regulations (other than IPRs) have a significant negative correlation with both R&D spending and patenting[15]. Countries with the least competition restraining regulation (such as the US, Denmark, Sweden, Japan and Finland) are ranked among the top six according to R&D intensity whereas countries with more restrictive regimes (such as Poland and Italy) have a very low R&D intensity.[16]

In conclusion, there seems to be no important conflict between innovation and competition policy aimed at product market competition and there seems to be no fundamental flaw in competition policy. Competition policy, by defending competition and open markets, will in general have a positive impact on both static and dynamic efficiency. [17]

2.2 IP law and innovation[18]

To strike the right balance between under- and over-protecting innovators' efforts, intellectual property rights differ from and are usually less absolute than 'normal' property rights: they are often limited in duration (patents, copyright), not protected against parallel creation by others (copyright, know-how) or lose their value once they become public (know-how).

If IP law would always strike the perfect balance in every situation, it could be argued that there would be less reason for competition law to be applied. Whether IP laws do in fact strike the right balance between over- and under-protection of innovators' efforts and whether and how competition policy should intervene in this area are difficult questions. They were dealt with during the hearings organised by DOJ and FTC on "Competition and Intellectual Property Law and Policy in the Knowledge-Based Economy".[19] They were also discussed in a recent OECD roundtable on competition policy and intellectual property, with a focus on the biotechnology industry.[20]

IP law certainly helps defend the incentive to innovate by providing a property right to the innovator. This in principle allows the innovator to reap the benefits of his invention and to go to court against free

15 See OECD ECO/WKP(2005)44

16 See FN 2

17 In any event, as shown in the EU Annual Progress Report, the level of competition cannot generally be deemed too high as to limit innovation; "Time to Move Up A Gear" The European Commission's 2006 Annual Progress Report on Growth and Jobs. COM(2006). The report underlines that the functioning of the internal market and the need to enhance competition and market access in general deserved greater attention.

18 This section and the next are in good part based on a paper by Philip Lowe and Luc Peeperkorn "IP: How Special Is Its Competition Case"?; presented at the 10th Annual EU Competition aw and Policy Workshop (3-4 June 2005/Florence)

19 In the subsequent FTC report "To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy", October 2003, proposals are formulated to improve the US patent system.

20 OECD, 8-9 June 2004.

riding on his innovative effort. IP law also supports the dissemination of innovations. Patent law requires disclosure of the innovation, which allows follow-on innovation. More importantly, the property right also enables the innovator to license his innovation. Licensing will mostly be pro-competitive. It facilitates diffusion of innovation and enables the efficient integration of technological assets of the licensor with production assets of the licensee(s) as the licensor may not be himself the most efficient producer. Licensing may also reduce duplication of R&D, it may spur incremental innovation and through the royalty income it strengthens the incentive for the initial R&D. Lastly, licensing may help to create competition on down-stream product markets.

However, it is also clear from studies that in most industries patents do not play a very important role for companies in protecting and exploiting innovation.[21] Natural secrecy, recognition lags, learning curve effects, the imitator's need to duplicate at least a part of the R&D effort to overcome practical production problems (the so-called need to develop 'absorbtive' capacity) and first-mover advantages are all ranked ahead of patents as appropriation mechanisms. However, for certain sectors like the pharmaceutical sector, patents are recognised as being very important for the appropriation of the revenues from innovation.

Jaffe confronts the outcome of the managerial surveys by Levin and by Cohen and their co-authors with the dramatic increase in US patenting since the mid-1980s.[22] Part of the increase is thought to be related to an increase in R&D spending. Part may also be explained by regulatory capture leading to wider patentability and a friendlier attitude of courts towards protecting or ensuring the validity of IPRs. Part of the increase is also explained by a shift in the technological possibilities for inventions in certain new areas such as biotechnology. However, the main explanation for the increase is thought to be an increase in productivity of the research process in general, at least in terms of its ability to produce patents. Jaffe asks why firms take out more patents while they do not perceive them as any more effective.

His explanation to reconcile the increase in patents with their perceived ineffectiveness to protect innovation is the multiple ways that firms use patents. In addition to protecting the returns on innovation for which they are intended, firms seem to use patents more and more "to block products of their competitors, as bargaining chips in cross licensing negotiations, and to prevent or defend against infringement suits."[23] As Jaffe argues, the latter uses of patents are to a significant extent a zero-sum or negative-sum game. The more companies block, accumulate bargaining chips and patent portfolios, and patent to file for or defend themselves against infringement suits, the less they all succeed in increasing their returns from innovation. A company's private marginal return on patenting may be high but firms' actions largely offset each other, with the result that the overall value of patents is seen as being diminished.

In other words, it is increasingly being recognised that patents and the patent system may not always stimulate innovation but may also be used for other defensive purposes and may retard (follow-on) innovation. This seems to be confirmed by recent OECD work. The 2006 OECD report "Going for

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21 See Richard Levin, A.K. Klevorick, R.R. Nelson and S.G. Winter, Appropriating the Returns from Industrial research and Development, 1987, Brookings Papers on Economic Activity 3, and the follow-up to this survey by Wesley M Cohen, R.R. Nelson and J. Walsh, Protecting Their Intellectual Assets: Appropriability Conditions and Why US Manufacturing Firms Patent (Or Not), NBER, Working Paper 7552, 2000. See also F.M. Scherer and D. Ross, Industrial Market Structure and Economic Performance, 1990, Chapter 17.

22 Adam B. Jaffe, The US Patent System in Transition : Policy Innovation and the Innovation Process, NBER, Working paper 7280, 1999. The paper (figure one) shows roughly a doubling in domestic patent applications and domestic patents granted between 1984 and 1998.

23 Jaffe, p.16.

Growth"[24] has looked at the situation in the different OECD countries analysing their policy mix. The conclusion it draws is that a high level of IPR protection is not necessarily leading to strong business spending on R&D. Also in the note of the OECD secretariat of 25 September 2006 (DAF/COMP(2006)22) it is said that patents may play a relatively small role in innovation and that the recent surge in the number of patents may not be due to greater innovative activity but rather to other factors such as declining patent fees and the pressure to build up large patent portfolios to negotiate with other patent holders.

The note by the Secretariat also points out that there is a growing need to ensure that patent systems strike the right balance to foster technological progress for society as a whole. The Competition DG agrees with this view. It is furthermore essential to place more emphasis on the incentive to innovate provided by IPRs rather than on the exclusive rights it confers on the holder. The question has often arisen as to the level of reward an inventor needs to produce his invention and whether this reward should just cover the costs of inventing or the full economic value of the invention or something in the middle. It is difficult to find the right answer to this complex question, but in our view IPR law should mainly be designed to create incentives to innovate. As the note by the Secretariat rightly concludes, policymakers face the challenge of creating an environment in which the rewards for innovation are sufficient to encourage it, but make sure there are also sufficient competitive pressures that encourage firms to create, use and disseminate innovations.

2.3 Competition law and IP law

Early copying of an innovation and free riding on an innovator's efforts undermine the incentive to innovate. This is why IP laws grant the innovator a legal monopoly. They provide the innovator the right to exclusively exploit the innovation and exclude others from exploiting it. A legal monopoly may, depending on the availability of substitutes in the relevant market, in turn lead to market power and even monopoly as defined under competition law. One could therefore come to the conclusion that there is source of conflict: that competition law would take away the protection which IP law is providing. If the aims of IP law and competition law are truly different, this might impose serious limits on the application of competition law to IP.

However, this is only an apparent source of conflict. At the highest level of analysis IP and competition law are complementary because they both aim at promoting consumer welfare. Competition policy aims at promoting consumer welfare by protecting competition as the driving force of efficient and dynamic markets, providing at all times the best quality products at the lowest prices. The objective of IP laws is to promote technical progress to the ultimate benefit of consumers. This is done by striking a balance between over- and under-protection of innovators' efforts. The aim is not to promote the individual innovator's welfare. The property right provided by IP laws is awarded to try to ensure a sufficient reward for the innovator to elicit its creative or inventive effort while not delaying follow-on innovation or leading to unnecessary long periods of high prices for consumers. A delay in follow-on innovation may result when the innovation consists of an improvement on earlier ideas that have been granted patent protection already. Unnecessary long periods of high prices will result when the innovation allows the IPR holder to achieve market power in the market(s) where the IPR is exploited and where the IPR protects this monopoly position longer than is required to elicit the innovative effort.

[24] See OECD - Economic Policy Reforms: "Going for Growth"; of 9th February 2006; by Jean Philippe Cotis; at: http://www.oecdwash.org/PDFILES/gfg2006_cotis_washington.pdf#search=%22OECD%202006%20Going%20for%20Growth%22; page 67 ff.

2.4 Competition policy in innovative sectors

Recently there has been a more refined debate, as to whether the supposed different dynamics of competition in sectors undergoing rapid technological change requires a more or less fundamental revision of competition policy for those sectors. For instance Evans and Schmalensee argue that competition in important new industries centres on investment in IP. Firms engage in competition for the market through sequential winner-take-all races to produce drastic innovations, rather than through price/output competition in the market and through incremental innovation.[25] They argue that firms will obtain considerable short-run market power, but ignoring their dynamic vulnerability may lead to misleading antitrust conclusions.

For competition policy it would therefore be important to distinguish between industries where markets are (continuously) destroyed and replaced through drastic innovations and industries where within markets innovation develops incrementally. Evans and Schmalensee identified the following industries as having Schumpeterian dimensions: computer software, computer hardware, internet based businesses (portals, BtoB exchanges), communications networks, mobile telephony, biotechnology and, to a lesser extent, pharmaceuticals.

This is again in the first place an empirical question. Evans and Schmalensee acknowledge that an initial phase with bursts of innovation may only characterise the infant stage of a new industry and may very well be followed by a long period of comparative stability and incremental innovation. They for instance refer to the car industry having had Schumpeterian aspects around 1910 and decades of stability afterwards. Other examples are the chemical and electronics industries that were described in the fifties as 'new-economy'.[26] It seems most likely that also today's 'new economy' industries will turn into more 'normal and traditional' industries if they haven't done so in good part already.

In addition, Evans and Schmalensee recognise that many of the sectors they have identified as having Schumpeterian characteristics have network effects and that these effects tend to reinforce the market leaders' position and that switching costs and lock-in may prevent displacement of market leaders. It is the task of competition policy to try to prevent that the market leader in a network sector develops into an entrenched dominant company.

The general conclusion in the literature is therefore also that dynamically competitive industries should not be immune from antitrust scrutiny, nor that the basic principles of antitrust should be modified.[27] Price fixing, foreclosure, market partitioning etc. can and will still harm consumers, also in the 'new economy'. However, as is the case for every sector, also for the new-economy industries competition policy needs to take account of industry or technology specific characteristics. As Peter Freeman concluded in his 2004 address to the CBI Competition Conference, there is no substantive tension or conflict between innovative markets and standard competition policy analysis where that analysis is

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25 David S. Evans & Richard Schmalensee, Some Economic aspects of Antitrust Analysis in Dynamically Competitive Industries, NBER Working Paper 8268, May 2001. Research for the paper was supported by Microsoft and both authors also worked for Microsoft as consultants in the United States v. Microsoft Corp. case.

26 See David E. Lilienthal, Big Business: A New Era, 1952.

27 See for instance also E-Commerce and its Implications for Competition Policy, Discussion Paper 1, OFT, August 2000, p.1: "…e-commerce will not give rise to any entirely new forms of anti-competitive behaviour, nor will it raise any new issues that cannot be dealt with under the existing competition law framework. However, … there are … areas where detailed application of the rules may require some adjustment."

applied sensibly and with flexibility, recognising the true characteristics of the particular market being examined.[22]

3. Innovation: Recent developments in EC competition law

Section 3 briefly explains how innovation is taken into account in the application of Articles 81 and 82 EC (antitrust), Regulation 139/2004 (merger control) and Articles 87-88 EC (state aid). Using its legislative and enforcement powers, the Commission tries to capture the specificities of IP without losing sight of our goal to protect competition in the consumers' interest. The European Commission's current competition policy constitutes an important contribution in the context of the Lisbon Agenda for Jobs and Growth, and its overriding objective to foster innovation in the EU.

3.1 Innovation and Antitrust

3.1.1 Specific regime for technology transfer agreements

In particular in innovative sectors licensing is important for economic development and consumer welfare as it helps disseminate innovations and allows companies to integrate and use complementary technologies and capabilities. However, licensing agreements can also be used for anti-competitive purposes. For instance, when two companies use a license agreement to divide markets between them or when an important licensor excludes competing technologies from the market. The note by the Secretariat (DAF/COMP(2006)22; page 9) rightly states that it is crucial to find the right approach with regards to the possibilities of patent holders to license their rights to other market participants.

Commission Regulation (EC) No 772/2004[28] determines the specific conditions of the application of Article 81 EC to *technology transfer agreements.* The agreements covered by the TTBER (technology transfer block exemption regulation) concern the licensing of technology where the licensor permits the licensee to exploit the licensed technology for the production of goods and services. The aim is to strengthen the incentives for initial R&D, facilitate diffusion and generate market competition. The Regulation creates a "safe harbour" for agreements producing positive effects which outweigh the restrictive effects, below a 20% market share threshold for agreements between rivals and below a 30% market share threshold for agreements between non-competitors. The TTBER also contains hardcore restrictions. The inclusion in an agreement of a hardcore restriction makes it impossible for the agreement to benefit from the block exemption.

The block exemption regulation was adopted together with a set of *Guidelines* on the application of Article 81 of the EC Treaty to technology transfer agreements[29]. These Guidelines set out the principles and provide guidance on the interpretation of the TTBER. The Guidelines stipulate the important principle of Community exhaustion of IPRs. They further provide a framework to assess whether or not licensing agreements are likely to affect inter- or intra-technology competition. To that end it has to be verified whether the agreement at stake restricts competition that would have existed in its absence or absent the contractual restraints. The Guidelines further contain useful clarifications regarding market definition in the field of technology licensing, the scope of the TTBER and the safe harbours. The Guidelines also contain explanations on the hard core restrictions. Finally, they also give guidance on the application of Article 81 (1) and (3) to technology transfer agreements that fall outside the block exemption, for instance

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28 OJ L 123/11 of 27 April 2004.

29 OJ C 101 of 27.4.2004. Also available on the website of the Directorate-General for Competition at: http://europa.eu.int/comm/competition/antitrust/legislation/entente3_en.html#technology

because the relevant market share threshold is exceeded. This guidance is provided for various types of licensing restraints (sales restrictions, output restrictions, field of use restrictions, tying and bundling and non-compete obligations). The Guidelines conclude with a section on technology pools, clarifying policy towards this instrument which is more and more used to support industry standards and to overcome patent thicket problems.

The underlying philosophy of these new rules is that in many cases having an IPR will not automatically imply having market power as sufficient competing technologies may exist. Licensing, also when it contains competition restrictions on licensee or licensor, will therefore mostly be pro-competitive as it allows the integration of complementary assets, allows for more rapid entry and helps to disseminate technology and to provide a reward for what was usually a risky investment. However, it is recognised that licensing agreements may also sometimes be used to restrict competition, in particular in those cases where one or the other party enjoys market power. It is therefore important in such cases to protect competition.

The technology transfer block exemption represents an important improvement compared to the replaced 1996 Regulation in terms of clarity, scope and economic approach. The Regulation provides more freedom to companies to draw up licence agreements according to their commercial needs, while protecting competition and therewith innovation. It also brings about an important degree of convergence between the application of competition policy to licence agreements in the EU and US.

3.1.2 Article 82 Discussion Paper

First of all, it is important to note that under EC law an IPR does not automatically confer upon its holder a dominant position. Furthermore, there is no obligation for the dominant holder of an IPR to license it to other companies[30]. That said, a refusal by the dominant company may be seen as problematic under certain circumstances, e.g. if it prevents the development of a market for which the license is an indispensable input, to the detriment of consumers[31].

The Commission in its Discussion Paper on the Application of Article 82 EC (abuse of dominance) summarises the Competition DG's reflections on abuse of dominance including the assessment and evaluation of IPR rights (e.g. the issue of a dominant company refusing to license intellectual property rights). Section 9.2.2 of the Discussion Paper mentions the five conditions which are usually applied by the European Commission to evaluate a refusal to start supplying an input. These are the following: (i) the behaviour can be characterised as refusal to supply; ii) the company is dominant; iii) the input is indispensable; iv) the refusal is likely to have a negative effect on competition; v) the absence of an objective justification. In order for a refusal to license an IPR to be abusive one additional condition has to be fulfilled: the refusal must prevent the development of the market for which the license is an indispensable input, to the detriment of consumers. The European Court of Justice in its judgment in Case C-418/01 IMS Health[32] has stated that this may only be the case if the undertaking requesting the license does not intend to only duplicate the goods or services offered by the IPR holder but intends to really produce new goods or services for which there is potential consumer demand (par. 49 of the judgement).

30 E.g. Case 238/87 AB Volvo v Erik Veng (UK); ECR 6211;

31 DG Competition Discussion Paper on the Application of Article 83 of the Treaty to exclusionary abuses; par. 239; http://ec.europa.eu/comm/competition/antitrust/others/discpaper2005.pdf

32 IMS Health GmbH & Co v NDC Health GmbH & Co. KG (2004) ECR I-5039

The Discussion Paper also makes reference to another very important abuse case with high relevance for innovative markets: the Commission's decision in Astra/Zeneca of 15 June 2005[33].

3.1.3 Astra/Zeneca

The Discussion Paper concludes that where a certain exclusionary conduct is clearly not based on competition on the merits (creating no efficiencies and only raising obstacles to residual competition) this conduct is presumably abusive. The dominant company has the possibility to rebut this presumption by providing evidence that the conduct in question does not and will not have the alleged likely exclusionary effect or is objectively justified (see par. 60 of the Discussion Paper). This was the scenario in Astra/Zeneca. In this case (currently under appeal before the CFI) the Commission found that the company, dominant in the market for proton pump inhibitors (PPIs) with its product "Losec" had infringed Article 82 EC by misusing pubic procedures in a number of EEA States only with the objective to exclude competition from generic rivals. AZ was fined 60 million Euro.

AZ's first abuse involved misuse of a EC Regulation creating supplementary protection certificates which allow extension of basic patent protection for pharmaceuticals. The concrete abuse consisted in misleading representations made by AZ before patent offices. Due to these misleading representations AZ managed to delay the entry o cheaper generic versions of Losec (with costs for health systems and consumers). The Commission's intervention under these circumstances was very important given that the authorities applying the patent procedures have little or no discretion. Although there exist other legal rules which could have been used by the generic producers as remedies, the Commission found that there is no reason to limit the applicability of competition law (rules on abusive conduct) to situations where such conduct does not violate other laws and where there are no other remedies.

The second abuse consisted of AZ's requests for the deregistration of its market authorisation for Losec capsules in several Nordic countries, thus removing the reference market authorisation on which generic firms and parallel traders arguably needed to rely at the time to enter or remain on the market[34]. Again, this second exclusionary abuse took place in a regulatory context characterised by little or no discretion on the part of the authorities concerned. The Commission found that dominant companies have a special responsibility to use specific entitlements (including IPRs) in a reasonable way in respect of market access for other parties. The types of abuse are both novel and represent the Commission's first decision in relation to patent "evergreening" (the practice of extending the period over which a patentee of a pharmaceutical product may enjoy monopoly rights beyond the period of basic patent protection).

Finally, the EC Discussion Paper on Article 82 refers to the specific scenario of a refusal to supply information by a dominant provider in a way that allows it to extend its dominance from one market to another: this is the case for information necessary for interoperability between one market and another. The principle promoted by the EC Discussion paper (par. 241) is that leveraging market power in this way by refusing interoperability information may be an abuse of a dominant position.

3.1.4 Microsoft

The Commission had to address this scenario in the Microsoft case[35]. In its 2004 Decision (currently under appeal before the CFI) the Commission, after having found that Microsoft had infringed Article 82

33 Case COP/A.37.507/F3-Astra Zeneca; decision of 15 June 2006

34 Note that EC legislation has recently been modified to address this problem: As of 30 October 2005 it will no longer be possible to prevent generic entry by withdrawing a European reference product.

35 Case COMP/C-3/37.792 Microsoft of 24 March 2004

EC by leveraging its dominant position verging on monopoly in a primary market (PC operating system market) into a secondary market (work group server operating system market, ordered Microsoft to disclose to other software developers certain information necessary to ensure the interoperability of their products (work group server operating systems) within Microsoft's dominant platform. Although the case is not a compulsory licensing case, it does have intellectual property implications insofar as Microsoft is an IP company. And as the ECJ has held, a refusal to license intellectual property is under certain exceptional circumstances not immune to antitrust enforcement.

Although intellectual property rights were raised as a justification by Microsoft, the gist of the case concerned a refusal to disclose secret information, the innovative character of which was unclear[36]. The information at stake was indispensable to compete viably against Microsoft in the relevant market and Microsoft's refusal had already allowed it to achieve a dominant position, and risked eliminating competition in that market. Competitors were prevented from bringing to customers new and improved products that interoperate with Windows, in contradiction with Article 82 (b).

The 2004 Decision did not order the compulsory licensing of Microsoft IP, but the disclosure of certain interoperability information. In doing so, the Commission carefully established that the conditions judged to be sufficient by the ECJ in its compulsory licensing *IMS Health* ruling (indispensability of the refused right, risk of elimination of all competition, preventing the emergence of new products and services for which there is a potential consumer demand) were met in the Microsoft case.

The Commission when taking its decision considered not only Microsoft's incentives to innovate but the incentives of the whole market to innovate. It concluded that Microsoft's refusal to disclose the interoperability information was itself reducing the incentives of rivals to bring innovative products to the market because without the interoperability information they will not be in a position to compete on the merits. The objective of the remedy is to induce rivals to innovate along with the dominant company.

As it was shown in the Microsoft case, the Commission always takes an extremely cautious approach in this area. In applying the so-called *IMS* conditions, the Commission will always examine carefully the impact of the refusal to supply on incentives to innovate.

3.2 Innovation and Merger Control

As to merger control, the Commission has always paid attention to the innovation elements of a notified merger. In its investigation the Competition DG also takes due account of the impact of a transaction on R&D and innovation. The capacity of a merger to limit innovation in the market can be a very important element, because it may increase the risk of dominance leading to lower investment in research or because an innovative maverick is taken out of the market. But the Commission does not only exercise a negative control trying to preserve incentives and abilities to innovate. The Commission also looks favourably at mergers that promote innovation through mergers and acquisitions. This is notably done when analysing efficiencies. The Commission last year published Horizontal Merger Guidelines[37]. In these Guidelines, it is explicitly recognised that innovations, as dynamic efficiencies, are taken into account when assessing the positive impact of a merger.

The Guidelines reflect how the Commission takes into account innovation and the specifics of IPRs and innovative markets in its merger analysis. When interpreting market shares, for example, the

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36 Note that the Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs (OJ L 122, 17.5.1991, p. 42–46) explicitly recognises the value of interoperability in software markets, and allows companies to access the interface information necessary, to the extent feasible.

37 Guidelines on the assessment of horizontal mergers (OJ C 31/5 of 5.2.2004)

Commission takes into account the particular market conditions, e.g. if the market is highly dynamic or if the structure is unstable due to innovation and growth[38]. Innovation is also taken into account when assessing non-coordinated effects. For example, in markets where innovation is an important competitive force, a merger may increase the firms' ability and incentive to bring new innovations to the market and exert pressure on rivals to innovate, too. Or vice versa, effective competition may be impeded by a merger between two important innovators (e.g. two firms with pipeline products). When analysing coordinated effects the Commission takes into account the characteristics of innovative markets and recognises that coordination may be more difficult given that innovations if they are significant may allow one firm to gain a major advantage over its rivals.39 Furthermore, innovation is also an important factor to consider when evaluating market entry barriers. In this context the Commission for example examines whether incumbents enjoy technical advantages (including preferential access to innovation and R&D[40] or IPR), which make it difficult for any firm to compete successfully. In certain industries it might be difficult for companies to enter the markets because patents protect products and processes. This may be the case because entrants need access to a protected technology to launch their own products or because their new products risk infringing existing IPRs. Finally, innovation is also a key element in the examination of efficiencies created by mergers. Mergers may bring about various types of efficiency gains which can lead to benefits for consumers, e.g. in resulting from improved products and services obtained by efficiency gains in the area of R&D and innovation. For instance, a JV set up to develop a new product may bring about the type of efficiencies the Commission can take into account when deciding over a proposed concentration.

3.3 Innovation and State Aid Control

3.3.1 Basic policy considerations

The basic assumption is that competition in functioning markets creates strong incentives for companies to invest in knowledge and innovation which generate competitive advantages and profits[41]. An innovative company will typical enjoy faster growth in competitive markets enabling it turn its creative efforts into value. Preserving competition by controlling harmful State aid, abuses of dominant positions and other anti-competitive conduct is thus crucial. Nevertheless, there is no rule without exemption. There are situations where markets, left to their own devices, fail to deliver efficient outcomes. In such cases it is not sufficient to rely on market forces and free competition to achieve the desired outcomes. In these specific cases of market failure, State aid may contribute to fostering innovation by increasing the incentives of businesses to invest more in innovation. It is, however, important to stress that State aid constitutes but one element in a much wider package of structural reforms to encourage innovation. State aid, used judiciously, should be viewed as a complementary tool to support innovation.

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38 See for example Case COMP/M.2256-Philips/Agilent; par. 31-32 or Case COMP/M.2609-HP/Compaq; par. 39).

39 See par. 45 of the Guidelines on the Assessment of horizontal mergers (OJ C 31/5 of 5.2.2004)

40 See Case IV/M.774-Saint Gobain/Wacker Chemie (OJ 247, 10.9.1997)

41 Recent OECD analysis finds that stricter competition-restraining regulation significantly reduces business R&D intensity. See Economic Policy Reforms "Going for Growth" (2006), p. 67 (section II.3 entitled "Encouraging Innovation: An Overview of Performance and Policies").

3.3.2 State aid for research & development and innovation

To meet the 3% R&D target set by the Lisbon Agenda several building blocks are regarded as fundamental, a central one being the revision of the state aid framework for R&D and innovation[42]. The envisaged aim is to facilitate access to finance and risk capital as well as public financing of R&D and innovation.

The State Aid Action Plan (SAAP) adopted in June 2005 stated that the Commission would consider creating a Framework for R&D and Innovation. Under the specific adoption procedures applicable to State aid instruments, the Commission has issued new guidelines on State aid for Risk Capital and is currently finalising new rules on State aid for R&D and Innovation. These new rules are designed to encourage Member States to invest more in R&D and Innovation as well as Risk Capital as a percentage of their total State aid budgets. They are also intended to support Member States in using a more economics based approach in order to target State aid towards the right projects, i.e. where the benefits of State aid outweigh any harm to competition and trade. The new rules provide for increased legal certainty and introduce modern R&D categories, as well as a series of new measures for innovation: aid for young innovative start-ups; aid to SMEs for advisory and support services or for the loan of qualified personnel; aid for process and organisational innovation in services, aid for innovation clusters and aid for technology transfer[43].

3.4 Innovation and competition advocacy

3.4.1 The regulatory framework and its significance for innovation

The regulatory environment is a very crucial factor when it comes to business innovation. The above-mentioned OECD report "Going for Growth" (2006)[44] finds that strict competition-restraining regulation (other than IPR) will always significantly reduce business R & D intensity. It is therefore crucial for legislators to be aware of the potential harmful effects of competition restricting regulation. The OECD study concludes that of the various policy elements studied (including subsidies, private sector credit, import penetration, etc.) reducing anti-competitive regulation was found to be the second most powerful thing that governments should do to raise the level of business R&D spending (and six times stronger than enhancing IPRs).

The Commission that competition-enhancing regulation is a fundamental component of any policy strategy aimed at strengthening innovation and competitiveness. The Competition DG is actively engaging in competition advocacy activities in a number of sectors, which are very important as an input for innovative industries (e.g. the financial services sector) or where innovation is a driver of competition (e.g. professional services). In addition, the Commission has recently developed a revised impact assessment system to assess the potential economic effects of legislative proposals submitted by the Commission, including the competition effects.

3.4.2 The competition test applied to EC draft legislation

Before adopting new regulatory frameworks the Commission's services have to engage in a comprehensive evaluation of its potential impact on the economy, including competition impacts. The Commission's services when preparing draft legislation are called to consider carefully whether

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42 See Communication to the Spring European Council of 2 February 2005 "Working together for Growth and Jobs"; page 9; http://ec.europa.eu/growthandjobs/pdf/COM2005_024_en.pdf

43 For more details, see: http://ec.europa.eu/comm/competition/state_aid/overview/sar.html

44 See FN 2

government regulation in a sector is necessary, and, if it is, make sure that the regulation is the least intrusive and most open to competition that it can be. Taking the example of intellectual property rules, for example, the challenge is to ensure sufficient IP protection to guarantee investment in IP, but not overly broad protection that helps perpetuate market power and excludes follow on investment.

In June 2005 the Commission – as part of its Better Regulation agenda[45] - adopted revised Impact Assessment Guidelines[46], covering all legislative and policy initiatives included in the Commission's Annual Work Programme. Such assessments explore alternative options to solve a defined problem and evaluate their economic, environmental and social impact. The basic "competition test" applied in the context of competition policy screening involves asking two fundamental questions at the outset. First: what restrictions of competition may directly or indirectly result from the proposal (does it place restrictions on market entry, does it affect business conduct etc.)? Second: are less restrictive means available to achieve the policy objective in question?

The Impact Assessment Guidelines recognise that "vigorous competition in a supportive business environment is a key driver of productivity growth and competitiveness"[47]. Competition advocacy in the form of Competition screening therefore forms an integral part of impact assessment. The Impact Assessment Guidelines list – non-exhaustively – the types of proposals which need to be screened for possible negative impacts on competition (for instance rules on liberalised network industries, measures which have an impact on barriers to entry and exit, exemptions from competition rules etc.)[48].

4. A broad based Innovation Strategy for Europe

As requested by the Spring European Council in March 2006, the Commission on 13 September 2006 adopted a Communication defining a Broad Based Innovation Strategy for Europe[49] that translates investments in knowledge into innovative products and services. This Communication presents ways to better exploit the European Union's innovation potential, by accompanying industry-led initiatives with appropriate public policies. The Communication states that, while increased competition constitutes the most efficient instrument to stimulate innovation, policy measures and innovation support mechanisms may also have an important role to play.

The Communication 'a Broad Based Innovation Strategy for Europe' follows a series of previous initiatives and policy orientations by the European Commission[50], which tend to consider that only a combination of policies can bear fruits for innovation. Apart from the identification and diffusion of "good practices", it is important to assess whether the most important elements of a country's "system of innovation" function well, namely:

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45 See Communication from the Commission to the Council and the European Parliament of 16 March 2005 on "Better Regulation for Growth and Jobs in the EU"; COM(2005) 97 final

46 SEC (2005) 791.

47 See section 9 of the annexes to the Impact Assessment Guidelines. A specific DG COMP guidance paper is published at http://europa.eu.int/comm/competition/publications/advocacy/.

48 See section 9.2 of the annexes to the Impact Assessment Guidelines.

49 Communication from the Commission of 13 September 2006 to the Council, the EP, ECOSOC and the Committee of the Regions; COM(2006) 502 final

50 E.g. Innovation policy: updating the Union's approach in the context of the Lisbon strategy, COM(2003) 112 final; Innovation in a knowledge-driven economy, COM(2000) 567 final

- the general framework conditions within which R&D and innovation are generated and used, particularly highly competitive markets, flexible, mobile and skilled labour force, and well functioning capital markets (including venture capital);

- the overall knowledge base of the EU economies, in terms of well performing economic systems, and efficient public research and business R+D;

- sufficient incentives (including taxation) for business R&D and adequate rewards for successful discoveries;

- adequate networking and knowledge transfer mechanisms to exploit the potential of science-industry links and improve the commercialisation of research both at a domestic and at the EU levels.

5. Conclusions

In conclusion the Competition DG agrees with the conclusion drawn by the Secretariat's Note (p. 38) that patents clearly have a dual role of fostering innovation and diffusing technology. Judging from our experience we support the conclusion that competition is positively related to innovation. This conclusion can also be based on recent studies involving the degree of anti-competitive product market regulation and innovation in various OECD countries. A number of different factors support the positive correlation between competition and innovation.

First, effective competition provides incentives for firms to innovate, as they can profit from new and idiosyncratic knowledge[51].

Second, effective competition is a very effective mechanism to diffuse innovation. Well functioning innovation systems serve to ensure the free flow of information across the interfaces between large firms, researchers, entrepreneurs, investors of all kinds, consultants, patent agents and other intermediaries, local authorities and other actors. Competition pushes towards testing, imitation, and feed-back learning, which greatly contributes to the diffusion of innovation. Furthermore, open and competitive markets are a pre-requisite for SMEs and new entrants to spread innovations in the economy.

In light of these observations, competition authorities have an important task in preserving and protecting competition to foster innovation, with a special view to innovation driven markets. At the same time there is also a lot of scope for legislators and patent offices to stimulate innovation by way of designing patent laws. It is increasingly being recognised that patents and patent systems do not always stimulate innovation but are used for other defensive purposes, thus retarding (follow-on) innovation. This requires focus on improving IPR law and its application, including the working of the patent offices. EU competition policy is already revised and is still being revised to face the challenges and contribute to growth and innovation.

[51] See e.g. Teece, D.J. (1987) Profiting from technological innovation: implications for integration, collaboration, licensing and pubic policy. In D.J. Teece (ed.) The competitive challenge: strategies for industrial innovation and renewal: 185-219. Cambridge, MA: Ballinger. Berney, J.B. (1991) "Firm resources and sustained competitive advantage"; Journal of Management, 17:99-120

BRAZIL

(CADE)

1. Introduction.

This paper intends to contribute to the discussion on patents and defence of competition, from a developing country standpoint. Although Brazil was one of the 14 signatory countries of the Convention of Paris of 1883 (herein referred as "CUP"), Brazil places the 28th on the international ranking of patent concessions and most of them are deposited by international companies. From competition perspective, the low number of patents registered show that this is not among the main instrument of rivalry for the Brazilian companies' strategies.

As it will be shown later on, this fact reflects on the Brazilian competition defence records, with a marginal incidence of cases that discusses patents and competition environment.

The paper presents a quick look on how is the patent protection system in Brazil, as well as its relationship to antitrust through the reporting of some cases that involves innovation and patent protection on its analysis. Although, as mentioned, this subject is very incipient in the Brazilian competition analysis, the number of cases seems to be growing.

2. General information on the Patent Protection in Brazil

Under the TRIPS Agreement, all WTC´s members were obliged to implement national legislations based on minimum standards of industrial property protection, being respected the transition periods established by the agreement. Although Brazil was obliged to enforce the TRIPS dispositions only on 2000, on 1996 Law 9.279 (the "Law of the Industrial Property - LPI") was enacted, adopting all the minimum requirements of industrial property rights imposed by the Agreement.

As said, Brazil was one of the 14 signatory countries of the Convention of Paris of 1883, the first international agreement on intellectual property rights and it was one of the first nations to have legal protection of such rights, by a Royal Decree, enacted by King John VI on April 28, 1809.

On Constitutional level, the Federal Constitution of Brazil, enacted on 1988, established the basis for protection of industrial inventions, on its article 5º, XXIX[1], among the fundamental rights[2]. As per the mentioned article, the property rights protected must serve to a determined purpose, specifically, the Brazilian "social interest" and the economic and technological development of the country. Under such terms, any patent that does not "serve" to a social purpose shall be annulled.

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1 "XXIX. The Law shall ensure the authors of industrial inventions of a temporary privilege for their use, as well as protection of industrial creation, property of trademarks, names of companies and other distinctive signs, viewing the social interest and the technological and economic development of the country".

2 Some Brazilian authors criticize the fact that the intellectual property rights are established among fundamental rights on the Constitution, arguing that it cannot be a fundamental right of the citizen, but it is, indeed, a commandment to a specific legislation that should be included in the Economic Order Chapter.

The National Institute for Intellectual Property – INPI[3] (www.inpi.gov.br) is a federal agency created in 1970 (Law nº 5.648/70) and linked to the Ministry of Development, Industry and Foreign Commerce. Its main purpose is to "*execute, within the Brazilian territory, the norms that regulate the industrial property, in consideration of its social, economic, legal and technical function. It is also its attribution to make pronouncements about the convenience of signing, ratifying and denunciating internationals conventions, treaties and agreements on industrial property*". The Institute has also the competency for concession of trademarks; granting of patents, registration of agreements of technology transfer, as well as registration of computer programs, franchise agreements, industrial drawing and geographic indications.

Among other market-like mechanisms that were adopted by the Brazilian economic policy since the end of the 80´s, the Law nº 9.279/96 was enacted with all international standards of protection[4], as well as all legal mechanisms to make such protection efficient. That is, provision of patent protection has complemented the new institutional environment of an economy based on market mechanisms.

In 1997 the Law 9456 established the plant varieties protection, including the innovation in the biotechnology field. As one of the most important countries in agriculture products world supply, the formal and explicit recognition of intellectual property in this area is a crucial device to foster investments in R&D by agribusiness companies in Brazil.

Under the LPI, patent protection is granted, for 20 years, to inventions, understood as to be a result from the creation of the man, that should have an industrial (broadly conceived) use (the social function of the property, constitutionally determined). To be protected as a patent, an invention must attend to three requirements: (i) novelty; (ii) industrial use or application and (iii) sufficient description (technical replicable).

Although the legislation seems to be very complete and follows the international standards[5], Brazil places the 28th on the international ranking of patent concessions, as mentioned. According to INPI, 82,2% of the patents guaranteed belongs to foreign companies (Annex 1); and among the Brazilian holders, the majority of the protection are granted to the public sector. In 2005, approximately, 20.000 patents were deposited in INPI, against approximately 300.000 in US Among it, about 70% are international requests and the other 30% were presented to companies, universities, research institutes and researchers. As per INPI official data, only 0,2% of the national deposits came from universities, although this number is growing due to INPI's advocacy initiatives.

The current debate in Brazil with respect to industrial property protection is related to its enforcement. Specialists say that the law has all mechanisms necessary to guarantee such protection and do not need any amendment on this sense. The challenge keeps on being the enforcement in face of the tight constraint of financial and human resources.

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3 The Intellectual Property Rights in Brazil are also protected by two other bodies: (i) the National Committee of Piracy Combat (CNCP), a Council linked to the Ministry of Justice, responsible for preparing the principles for the elaboration of the national plan to piracy combat and crimes against intellectual property rights and (ii) the Interministerial Group of Intellectual Property (GIPI), linked to the Secretariat of Foreign Trade of the Ministry of Development, Industry and Foreign Trade responsible for the definition and integration of internal and external intellectual property policy (http://www.desenvolvimento.gov.br/sitio/ministerio/ministerio/colegiados.php?SQ_COLEGIADO=86).

4 As a matter of fact, some specialists complain that the law is more restrictive than the international regulations.

5 For instance, Law 9.274/96, follows the requirements and definitions of novelty to characterize an invention, what can be object of a protection, and some rights related to intellectual property holder such as inventor/creator protection.

According to the INPI there is a special need of advocacy initiatives. The effective protection of intellectual property rights is very recent and so, the society does not understand the reason for the protection and the effects of monopoly that such protection guarantee. Having this in mind, INPI is making efforts to diffuse the idea among companies to not disclosure their innovations before protection. The main focus of advocacy work, however, is before universities. Ten years ago only 4 of the main Brazilian universities used to deposit patents requests; nowadays, universities from all regions of the country have patent deposits.

Due to many reasons that cannot be developed in this paper, it was not expected that many cases involving innovation were discussed on competition-terms. However, as innovation and patent protection become more and more important as a competitive advantage, the number of mergers and acquisitions involving property rights protection, and anticompetitive strategies based of the abuse of intellectual property protection shall grow.

3. Patents and Competition Defence - Case Studies

Although there is not a special provision on the Brazilian Antitrust Law related to intellectual property right protection, as most international antitrust legislations has, Law nº 8.884/94 (the "Brazilian Antitrust Law") shall be applicable to cases of abusive use – or disuse – of intellectual property rights, as long as it affects competition conditions (e.g. characterizes an abusive anticompetitive practice or create market dominance)[6].

3.1 Mergers

The Guideline for Economic Analysis of Horizontal Mergers issued by Secretariat of Economic Monitoring of Ministry of Finance (SEAE) and Secretariat of Economic Law of Ministry of Justice (SDE)[7], herein denominated "Guidelines", mention patents in two situations: (i) as an element for market structure characterization and (ii) the compulsory patent licensing as a possibility of remedy to be imposed in case of anti-competitive operations, as it will be observed on the following case's description.

The Brazilian Competition Policy System (BCPS)[8] has analyzed few cases which explicitly involve innovation and patent protection. Most of such cases judged by CADE were related to agricultural sector, specifically the research and development of new technologies on seeds, to become resistant to herbicides. In most of cases, patents were understood as an element that raises the market power of the companies involved in a concentration operation and its ability to be involved in anticompetitive practices.

The changes on the institutional environment, with the enactment of the LPI and the Law of Plant Varieties Protection (Law nº 9.456/97, which grants the protection plant variety) reduced the risks involved on the protection of the investments in R&D for developments and improvements on the biotechnology area. Those changes are one of the elements that explain a new organization in the seeds market,

6 "CHAPTER I. - OBJECT

Article 1. This Law sets out rules on prevention and repression of violations of the economic order, guided by constitutional principles as free enterprise and open competition, the social role of property, consumer protection, and restraint of abuses of economic power.

Sole Paragraph - Society at large is entrusted with the legal rights protected herein".

7 Jointly Ordinance SEAE/SDE nº 50, of August 1, 2001.

8 BCPS is composed by Secretariat of Economic Monitoring of Ministry of Finance (SEAE) and Secretariat of Economic Law of Ministry of Justice (SDE), as investigative bodies and by CADE, which takes the final decision of all antitrust cases.

characterized by vertical integrations (specially the entrance of multinational companies acquiring national small agents) and technologic licensing and partnership agreements.

3.1.1 The Monsanto-Cargill case[9]

On 1998, Monsanto decided to buy all assets related to the development of hybrid seeds (corn, sorghum, soy, wealth and sunflower) of Cargill.

Monsanto has the patent of transgenic seed production technology, which grants the monopoly – and consequently market power - of the development and commercialization of seeds resistant to glyphosate herbicides (Round-up), which is also produced by the company. Such monopoly, according to the reporting-commissioner of the case results in better conditions for the imposition of unilateral anticompetitive practices by Monsanto on the market of glyphosate-based herbicides. Starting from this premise, CADE analyzed the possibility of Monsanto to impose restrictive measures, not on the glyphosate resistant seeds market, on which Monsanto has the exclusivity of product development granted by patent, but on the sale of glyphosate-based herbicides, where could be competition, as Monsanto patent had already been expired.

On May, 2004, CADE approved the operation, concluding that the acquisition could result in some benefits since it allowed Monsanto to improve technology and resulted in economy of scope by joining the two researches – development of seeds and herbicides. With respect to glyphosate herbicides commercialization, CADE observed that although the concentration resulted from the operation was high, it was not enough to Monsanto to conquer - and abuse - market, since Monsanto, in fact, had lost market share, due to the entrance of companies that offer generic versions of the glyphosate herbicide, which dropped prices.

CADE imposed a restriction on the approval of the case, prohibiting Monsanto to restrict the guarantee on the productivity of company's seeds only for the farmers that used the Monsanto's glyphosate-herbicides on the crops, in order to avoid future tying sale agreements. That is, the restrictions were supposed to avoid the time-extension of market-power granted for the herbicide patent, that had already been expired, through of the control on herbicide-resistant seeds protected by patents. As a strategy already denounced in other jurisdictions, CADE could avoid the same result in Brazil explicitly restricting this strategy.

3.1.2 The Technology Licensing Agreements' cases[10]

Monsanto signed many technology licensing agreements by which it licenses the use of modified genes in order to allow research institutes and seed producer companies to carry on researches on seed genes to make them resistant to herbicides. The licensed companies were the largest seed developers that owned germoplasm banks of adapted Brazilian varieties.

CADE understood that all operations that involve technology licensing for development, production and/or commercialization of seeds were pro-competitive since it make a 'key-technology' available to another agent, which would not be otherwise possible considering the existence of the technology monopoly by patent.

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9 Merger nº. 08012.005135/98-01

10 Merger nº 08012.004808/2000-01 (Embrapa - Brazilian Agriculture Research Corporation), 08012.008359/2005-11 (Agroeste), 08012.003997/2003-83 (Coodetec); and 08012.009265/2005-69 (Agromen).

However, most of these agreements contained an exclusivity clause, under which licensees were obliged to use Monsanto's herbicide on its test only, being forbidden, sometimes with the imposition of penalties, the use of glyphosate-based herbicide offered by any other producer.

BCPS considered this clause as anti-competitive, since it could provide conditions for market foreclosure and other competitor's exclusionary practices. Considering the complementarily existent between the transgenic seeds and the glyphosate-based herbicide, competition authorities identified a possibility of transference of Monsanto's market power, granted by the patents it holds on the seed market, to the glyphosate-based herbicide market. Under CADE's view, such exclusivity could restrict the development of glyphosate-based herbicides, once it does not permit the tests necessary for the certification of the herbicide, which block the entrance/development of any agent in the market.

Another element considered by BCPS on the last processes analyzed refers to the fact that Monsanto was contracting with different researcher institutes and seed producers. Such institutions hold specific germoplasm banks, adapted to certain regions, climes, soils and seed varieties that are different from an institution to another. On this sense, exclusivity with one of most of the mentioned organizations, taken the cases jointly considered, would result in much worse block restrictions to the market, since some varieties and characteristics would be 100% under Monsanto control, or even all of germoplasm of the country, precluding any new entrant in the transgenic glyphosate resistant-seeds market to get the adapted variety to Brazilian market.

It is interesting to note that on the first two cases, CADE approved the operation with the obligation to Monsanto to banish such exclusivity; on a third case analyzed (Monsanto-Embrapa), after the release of SDE's opinion recommending the restrictions on the exclusivity clause, Monsanto decided to exclude such clause before the final decision by CADE (and them the operation was approved without restrictions); and on the last case (Monsanto-Agromen, dated October, 2005, judged on May, 2006), the agreement does not contain any clause on this sense anymore. The most recent technology license agreement case, judged on June 2006, referred to the acquisition by DuPont of the intellectual property rights of a fungicide developed by Syngenta, does not also contain any exclusivity on its terms.

3.1.3. The SIM Cards case[11]

The only merger operation that does not involve the agriculture sector was recently approved with restrictions by CADE (Ordinary Session of October 04, 2006). The case was a merger between two European companies, Axalto Holding and Gemplus International, which produce plastic security cards and commercialize software, hardware and related services.

The analysis was mainly based on the impact of the dominance of technological resources on the competition. As per the Reporting-Commissioner description "the companies that act in this market can be divided in two strategic groups: (i) the companies, as Axalto and Gemplus, that hold technological resources to compete by innovation and receive revenues not only from the sale of cards but also from technology licensing; and (ii) companies that compete on the cards sales, which are based not on innovation but on costs reduction".

The case was also analyzed by the European Competition Authorities, who verified that the companies hold a big portfolio of patents in Europe. Based on this fact, CEE authorities decided to approve the merger but only under the commitment from the companies to licensing its intellectual property rights, since the dominance of such essential asset could block access to the cards market. The decision, however, is valid only on the European territory.

11 Merger nº. 08012.011178/2005-71.

In Brazil, CADE found out that the use of patent is not so relevant to the Brazilian market, considering the low number of patents granted (approximately 1/100 of the European patent protection). On the other hand, the control of Axalto and Gemplus over the valid patents and the ones which can be potentially protected in Brazil due to international intellectual right treaties summed could sustain a dominant position to the parties. Based on this, CADE imposed a commitment to the companies under which they are obliged to license their patents deposited in Brazil, related to SIM cards to any interested parties that operate in the Brazilian market by any form, under fair, reasonable, and non-discriminatory basis.

3.2 Conducts

With respect to conducts, Resolution CADE nr. 20, of June 09, 1999, which is considered as a guideline for violations analysis, include patent as an element of barrier to entry assessment. Law nº 8.884/94 expressly establishes the possibility of CADE to recommend to INPI the compulsory patent licensing depending on how serious CADE understands the conduct to be, even if the anticompetitive practice is not directly linked to the patent protection[12].

CADE judged very few cases of anticompetitive practices that involved innovation issues. So far the cases were all filed and although innovation were used as one element of the conclusions reached, it was not sufficient explored and worthy to be discussed herein.

4. Conclusion

Brazil has a very recent and incipient history of intellectual property rights enforcement. Due to this developing-institutional framework or other reasons not mentioned in this brief paper, patent registration has not been a major instrument of competition in the Brazilian economy.

By September 2006, there were thousands of patents deposits waiting for analysis at INPI, which cannot promptly respond for the recent growth of deposits due to the lack of human and budgetary resources.

This institutional environment led companies to adapt their strategies regarding R&D. For instance, in the agricultural sector, most of R&D developed by private companies was limited to hybrid varieties that have a higher probability to guarantee the appropriation of R&D results. Most of the innovation was made by EMBRAPA, a governmental company.

As might be expected, this state of affairs has been reflected on the Brazilian competition defence analysis. Very few cases have referred to market power based on patent protection. However, this dimension of competition has started to be more frequent, and we described some cases where this issue was addressed. Not by chance, most of the cases are related to the agriculture and agribusiness sectors and the biotechnology innovation field, as Brazil competitiveness in international markets can be affected by this technology development.

In all the described cases, restrictions had to be imposed in order to avoid harms to market competition based on strategies that make use of the granted patents.

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12 "Article 24. Without prejudice to the provisions of the preceding article [re. imposition of fines], the penalties listed below may be individually or cumulatively imposed on violations, whenever the severity of the facts or the public interest so requires: (…) IV - recommendation that the proper public agencies: (a) grant compulsory licenses for patents held by the violator;(…)"

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ANNEXX 1: INPI'S GRANTING OF PATENT STATISTICS

Year	Deposits	Invention	Utility Models	Certificate of Addiction	Patent Cooperation Treaty (PCT)	Total
1990	RES	2.389	2.887	-	-	**6.619**
	ÑRES	4.191	41	-	1.436	**6.125**
	Total	**6.580**	**2.928**	**-**	**1.436**	**12.744**
1991	RES	2.319	2.885	-	-	**6.472**
	ÑRES	3.263	41	-	1.727	**5.419**
	Total	**5.582**	**2.926**	**-**	**1.727**	**11.891**
1992	RES	2.100	2.207	-	-	**5.393**
	ÑRES	3.030	26	-	2.074	**5.516**
	Total	**5.130**	**2.233**	**-**	**2.074**	**10.909**
1993	RES	2.429	2.575	-	-	**6.402**
	ÑRES	2.958	43	-	2.543	**6.237**
	Total	**5.387**	**2.618**	**-**	**2.543**	**12.639**
1994	RES	2.269	2.446	-	-	**6.279**
	ÑRES	2.985	59	-	3.417	**7.083**
	Total	**5.254**	**2.505**	**-**	**3.417**	**13.362**
1995	RES	2.707	3.024	-	4	**7.232**
	ÑRES	3.271	50	-	4.702	**8.607**
	Total	**5.978**	**3.074**	**-**	**4.706**	**15.839**
1996	RES	2.611	2.911	-	19	**7.008**
	ÑRES	3.284	64	-	6.883	**10.908**
	Total	**5.895**	**2.975**	**-**	**6.902**	**17.916**
1997	RES	2.683	2.916	29	15	**7.140**
	ÑRES	3.758	94	5	8.599	**13.248**
	Total	**6.441**	**3.010**	**34**	**8.614**	**20.388**

Year	Deposits	Invention	Utility Models	Certificate of Addiction	Patent Cooperation Treaty (PCT)	Total
1998	RES	2.514	2.762	62	42	**7.057**
	ÑRES	3.657	73	5	9.886	**14.536**
	Total	**6.171**	**2.835**	**67**	**9.928**	**21.593**
1999	RES	2.849	3.247	61	30	**8.322**
	ÑRES	3.847	76	9	10.877	**15.625**
	Total	**6.696**	**3.323**	**70**	**10.907**	**23.947**
2000	RES	3.077	3.104	68	21	**8.946**
	ÑRES	3.651	85	7	10.624	**15.246**
	Total	**6.728**	**3.189**	**75**	**10.645**	**24.192**
2001	RES	3.298	3.280	79	13	**9.519**
	ÑRES	3.289	86	8	9.937	**14.188**
	Total	**6.587**	**3.366**	**87**	**9.950**	**23.707**
2002	RES	3.098	3.416	100	4	**10.102**
	ÑRES	2.899	46	3	10.183	**13.996**
	Total	**5.997**	**3.462**	**103**	**10.187**	**24.098**
2003	RES	3.652	3.425	109	18	**7.204**
	ÑRES	2.64	47	6	11.412	**13.629**
	Total	**5.186**	**3.472**	**115**	**11.430**	**20.833**
2004	RES	3.892	3.403	107	10	**7.412**
	ÑRES	2.356	47	7	7.881	**10.291**
	Total	**6.248**	**3.450**	**114**	**7.891**	**17.703**

- RES = residents and NRES = non-residents
- (*) Until 2001 the PCT'S are considered by the year of its international deposit.

Source: *www.inpi.gov.br* - Data updated until November, 2005.

CHINESE TAIPEI

1. Introduction

In preparing the present submission, the Fair Trade Commission (the FTC) consulted with the competent agency, the Intellectual Property Office (the IPO) under the Ministry of Economic Affairs, who is responsible for the Patent Act, Copyright Act, Trademark Act and others regulations. This submission summarises Chinese Taipei's general approaches toward dealing with issues pertaining to innovation, especially in regard to competition and patents.

In general, Chinese Taipei holds the view that competition law and patent rights share common objectives which are to encourage competition, innovation and economic development, on the one hand, and to benefit consumers with advanced and desirable products, on the other.

Article 45 of the Fair Trade Act states, "No provision of this Act shall apply to any proper conduct in connection with the exercise of rights pursuant to the provisions of the Copyright Act, Trademark Act, or Patent Act." Intellectual property rights are exclusive and entail the legal right of monopolisation that, on face value, might seem to be in conflict with the principles of free competition, as embodied in the competition law. The truth is, however, that while the Copyright Act, Trademark Act and the Patent Act are designed to protect the interests of the right holder, the Fair Trade Act seeks to protect competition order. The two goals are in fact complementary. The function of intellectual property rights is to encourage and protect innovation. This obviously helps upgrade technology, and it is via market competition that enterprises achieve technological upgrades. Thus, it is essential to sustain and encourage both innovation and competition. Such is the complementary and interactive relationship between the Fair Trade Act and the intellectual property rights laws.

The FTC has yet to encounter any competition issue arising from a patent on an innovation. However, in 2006, the FTC handled a case involving 3 notebook computer manufacturers that filed for permission of a concerted action in their joint plan to develop standardised components for notebooks, which would encourage innovation and benefit consumers.

2. Patent Scope

The IPO decides to grant a patent in accordance with the Patent Act after carefully examining the claims made by an applicant and judging whether the claims meet the requirements for obtaining the patent. In general, the broader the claims that a patent applicant makes, the greater is the patent protection that the patent applicant may receive. However, with such an application, there is simultaneously a greater risk that it will be rejected or declared invalid against a patent previously granted by the IPO.

The IPO decides to grant a patent to an applicant simply in accordance with patent requirements under the Patent Act. The coverage of the patent is not taken into consideration. Furthermore, to encourage innovation, the legal effects of patents are equal in all cases and all categories. Articles 52 and 56 of the Patent Act state this principle. Therefore, the patent scope cannot be affected by government policy that may discriminate against the patent in a particular case or a particular industry. Consequently, the IPO cannot use the control over the patent scope as an incentive for industrial innovation.

The IPO grants a patent when an application meets the requirements for a patent, no matter how broad or narrow the coverage of the patent application is. The IPO will not consider any possible anticompetitive effects that could arise from patent practices during the substantial examination of a patent application.

3. Patentability

To comply with Article 27 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), Articles 22 and 24 of the Patent Act regulate patent requirements and patentability. The requirements for obtaining a patent are that the patents should be novel, should involve an inventive step and should be capable of industrial application. There is seldom debate or argument to challenge the justification of those three requirements.

Pursuant to the Examination Guidelines for Patents in Chinese Taipei, the IPO presumes an invention in question involves an inventive step. It stipulates that each application for an invention patent must be limited to the objectives of the invention as a whole. If an invention can easily be accomplished by a person with ordinarily knowledge in that particular field of technology based on prior technology before the application for the patent is filed (or if an application claims priority, the priority date shall be used as the reference date), then such an invention is judged to be obvious and, therefore, does not involve an inventive step.

Pursuant to the provisions of the Patent Act, for a patent, no distinction is made between breakthrough technologies and incremental technologies. The IPO does not proceed to make such a distinction during the process of a patent examination.

4. Recent changes: Chinese Taipei's changes in patent regimes with respect to innovation

Amendments to the Patent Act were promulgated in February 2003. Importantly, the new Act better reflects the needs of the public and is consistent with international norms. It also strengthens the protection of intellectual property rights, accelerates the establishment of an innovative environment and requires a sounder patent examination. The amendments to the Patent Act with respect to innovation are explained in the following.

4.1 Early Disclosure Mechanism

Applications for invention patents require a certain examination period. This may lead to a third party engaging in a duplication of the research, investing in or applying the same field of technology if the invention patent is not disclosed until a substantial examination has been performed and approval granted by the IPO. The IPO shall have the invention patent application laid open after for a period of eighteen (18) months from the filing date of such patent application. These changes have produced several effects: the public are knowledgeable about the contents of the invention patent through early disclosure; the enterprise could decide whether to continue investing in research and development; and a third party could engage in further R&D so as to increase competitiveness in the industry.

4.2 Abolishing the Opposition System

In order to shorten the patent obtaining process, the amendments to the Patent Act have combined the cause of opposition and the cause of cancellation, while completely abolishing the opposition system.

4.3 Replacing Substantial Examination with Formality Examination for Utility Model Patents

To pursue a faster process and expedite commercialisation for utility model patents, the formality examination has been adopted to replace the substantial examination.

5. Whether patent rights should be strengthened?

Patent rights holders are obligated to bear social responsibility when they receive exclusive rights. However, conflict does not necessarily have to exist between whether patent rights should be strengthened and whether patent rights holders bear social responsibility. Chinese Taipei does not have a specific, uniform position toward this issue; this is typically decided on an issue-by-issue basis. Explanations for the draft amendments to the Patent Act are as follows:

5.1 Allowing the Patentability in Animal and Plant Patents

Pursuant to Article 27 of the TRIPS Agreement, each Member of the WTO has the right to determine the patentability of the plants and animals. Thus, allowing the patentability in animal and plant patents shall be taken as a measure to strengthen patent rights by means of expanding the coverage of patentability. However, in order to balance the protection of patent rights and their social responsibility, the IPO will simultaneously set relevant regulations concerning restraints on the scope of patent rights, such as the exhaustion of patent rights, experimental use exemption and farmers' privilege.

5.2 Compulsory Licenses on Pharmaceutical Exports to Least-developed Countries (LDCs)

Pursuant to the Doha Ministerial Declaration and the Protocol amending the TRIPS Agreement, in the case of national emergency, other circumstances of extreme urgency, or instances of public non-commercial use, a Member of the WTO is allowed to use compulsory licensing and thereby help developing and least-developed countries to obtain pharmaceutical products they require. Nevertheless, using compulsory licensing which may restrict the exclusive rights of a patentee could be deemed as a measure that weakens patent rights.

5.3 Streamlining the Procedures of Administrative Remedies

The purpose of streamlining the procedures of administrative remedies under the Patent Act is to facilitate decisions with regard to patent administrative litigation raised by a patentee in a timely manner. Chinese Taipei believes this amendment produces positive results as it strengthens patent rights.

6. Coordination with Patent Officials

The legislative purpose of the Patent Act is to encourage, protect and utilise inventions and creations so as to spur the development of industries. The purpose of a patent regime is to protect the interests of patent right holders. Thus, during the process of patent examination, the IPO shall not consider any anticompetitive issues that could arise from the granting of a patent.

Under the current Patent Act and the Fair Trade Act, there is no room for the FTC to directly participate in the granting of a patent. The IPO is staffed with legally qualified patent examiners whose main responsibility is to conduct examinations on patent applications.

The Fair Trade Act provides that its provisions shall not apply to any proper exercise of rights pursuant to the provisions of the Copyright Act, Trademark Act, or Patent Act. The FTC's interpretation of this provision is that consideration should be given to intellectual property rights by providing that only the legitimate exercise of those rights shall be exempted from the application of the Fair Trade Act. Otherwise, the FTC has a duty to intervene to maintain a balance between the interests of right holders and users. This clearly means that if the exercise of rights is undue, such as the undue extension of patent scope, the abuse of rights which damages the market, and the exercise of rights not under legitimate procedures, then the Fair Trade Act is applicable to such practices. In practice, the FTC generally resolves issues with potential

conflicts through consultation with other authorities, as provided for in Paragraph 2, Article 9 of the Fair Trade Act.

Article 72 of the Patent Act stipulates that in the absence of the conditions set forth in the preceding Paragraph, the competent authority may still, upon application, grant a compulsory license to an applicant to practice the patented invention in the event that the patentee has imposed restrictions on competition or has engaged in unfair competition, as confirmed by a judgment given by a court or a disposition made by the FTC. Thus, anticompetitive actions arising from patent licensing to a patent right holder could be corrected through intervention using administrative measures. In addition, compulsory licensing is the most useful remedy to deal with anticompetitive practices involving restraints on patent rights.

7. Concerted Actions and Innovation

The FTC only deals with patent cases involving CD-R licensing agreements and enterprises by issuing warning letters regarding the infringement of patent rights. Until now, the FTC has not received any case that has pertained to the issue of patent with innovation. In addition, the FTC does not get involved in innovation issues when dealing with merger and monopoly cases. However, in 2006, the FTC received a case concerning the application of concerted action. This case involves three notebook computer manufacturers that sought to jointly develop standardised components for notebooks, which could encourage innovation and benefit consumers. Therefore, the FTC approved this concerted action. The details of this case are outlined below.

7.1 Case Study: Information Technology Industry

In January 2006, three notebook computer manufacturers, namely Compal Electronics, Asustek Computer and Quanta Computer, applied for approval to jointly develop specifications of the D tray for notebook computers in order to formulate standardised specifications for components of the tray and to increase substitutable compatible components. As standardised specifications are provided to other enterprises that do not participate in such concerted action, those enterprises can also enjoy similar benefits when taking part in the production and sale of notebook computers.

In Chinese Taipei, the private brand market and the clone market account for roughly 80% and 20% of the notebook computer market, respectively. Due to the small volume and high degree of difficulty in designing notebook computers, they are designed by different enterprises and are not compatible with each other. Therefore, consumers cannot assemble those components and have only limited purchasing choices. This results in higher prices for notebook computers than desktop computers.

Concerted actions are prohibited under the Fair Trade Act. But, Article 14 of the Fair Trade Act specifically exempts concerted actions where the intent is to unify the specifications or models of goods for the purpose of reducing costs, improving quality or increasing efficiency, but only on the condition that these actions are beneficial to the economy as a whole, are in the public interest and have had prior approval.

In the case at hand, jointly unifying the specifications of the D tray for notebook computers could accelerate the growth rate of the market, develop the clone market and also reduce trading costs with suppliers, research and development costs as well as marketing costs. In addition, domestic OEMs could formulate standardised specifications and then use them when designing innovative products. In the long run, the standardised specifications would provide product and service providers with an impetus to compete in price, product features and after-sale service. The compatible products need to be simultaneously provided by all manufacturers so as to achieve the network effects and to maintain market competition. Besides the benefits above, consumers would have more options when purchasing notebook

computers and could also enjoy price decreases due to the economy of scale and cost reductions. The FTC found that jointly developing standardised specifications for notebook computers in this case would be beneficial to the economy as a whole and in the public interest and therefore granted its approval for such companies provided that they observe certain specified conditions.

In this case involving the three notebook computers manufacturers, the following undertakings are required and are attached to the decision concerning this merger report. The purpose is to maintain openness with respect to such concerted action and to avoid any possibility of abusing intellectual property rights:

- Information transparency: the contents of the standardised specifications must be disclosed within 3 months after completion;

- Reasonable licensing: the principles for granting the patent license in this case should be reasonability, fairness and non-discrimination;

- Free participation and expression of opinions: the applicants must provide appropriate opportunities for other enterprises to express their opinions regarding the standardised specifications;

- Non-exclusive supply: the applicants cannot use the joint plan for making research and development, or developing standardised specifications to lead only specific firms to supply or provide the relevant components with the standardised specifications; and

- No engagement in other concerted actions: the applicants cannot jointly decide the price, quantity, marketing territory and other transaction conditions of the standardised specifications for the notebook computers and their components.

BIAC

1. Introduction

BIAC appreciates the opportunity to submit the business community perspective on the issue of competition, patents and innovation.

The protection offered by intellectual property (IP) laws, and patents in particular, plays a crucial role in providing incentives for businesses to innovate, leading to dynamic efficiency gains and thereby contributing to economic efficiency and consumer welfare.[1] In this connection, the need for patent rights to be protected in order to provide incentives for the development of new inventions has been accorded global recognition through multilateral treaties such as the World Intellectual Property Organisation (WIPO) treaties and the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS).

Similarly, competition laws are geared towards increasing economic efficiency and promoting consumer welfare by creating and maintaining a marketplace where firms are encouraged to compete against one another and can participate free from anti-competitive excesses such as the abusive exercise of market power by one or more participants.

Patent laws and competition laws therefore have similar purposes. Competition authorities across the world have increasingly begun to recognise that competition laws and patent rights are in fact intended to achieve the same goals – that of enhancing economic efficiency and promoting consumer welfare, and are therefore complementary instruments of government policy.[2] Tension that arises between the enforcement of patent rights and competition laws is arguably due to the different approaches that each takes towards reaching their shared goals.[3]

BIAC has previously noted that one of the key principles on the issue of competition on the merits is ensuring that competition laws do not trample IP rights that promote innovation.[4] Businesses should be free to invent and innovate, and the role of patents in encouraging businesses to do so should not be undermined by overly restrictive competition laws.

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1 See, para 1.0, US Department of Justice and Federal Trade Commission, Antitrust Guidelines for the Licensing of Intellectual Property ("US Licensing Guidelines"); part 1, Canadian Competition Bureau, Intellectual Property Enforcement Guidelines ("Canadian IPEGs"); See, para 7, European Commission, Guidelines on the Application of Article 81 of the EC treaty to Technology Transfer Agreements ("EC Guidelines").

2 See, para 1.0, US Licensing Guidelines; part 1, Canadian IPEGs; para 7, EC Guidelines.

3 See, Sheridan Scott, "Competition Law and Intellectual Property Law: Getting the balance 'just right'", University of Victoria Faculty of Law International Intellectual Property Law Symposium, July 15, 2006, p. 2.

4 See, Summary of Discussion Points Presented by BIAC to the OECD at the OECD Competition Committee Roundtable on Competition on the Merits, June 1, 2005, paras 17 – 20.

As expressed in a recent speech by Thomas O. Barnett, Assistant Attorney General, Antitrust Division Department of Justice:

> [S]trong intellectual property protection is not separate from competition principles, but rather, is an integral part of antitrust policy as a whole. Intellectual property rights should not be viewed as protecting their owners *from* competition; rather, IP rights should be seen as encouraging firms to engage *in* competition, particularly competition that involves risk and long-term investment. Properly applied, strong intellectual property protection creates the competitive environment necessary to permit firms to profit from their inventions, which encourages innovation effort and improves dynamic efficiency.[5]

Moreover, as a general matter excessive government intervention and overregulation to address perceived market imbalances should be discouraged. Market forces typically operate to reward innovation and encourage new competition. Accordingly, restraint should be exercised by antitrust enforcement authorities particularly with respect to issues such as mandatory licensing and interference with licensing terms that are market-driven.

In this context, from a policy perspective, competition law enforcement authorities should proceed with caution when dealing with the intersection between competition law and patent rights with a view to removing uncertainties as to the scope of the patent right. Such clarity will encourage investment in innovation.[6]

Such caution is particularly apt in analyzing new and evolving technology-based industries which inherently experience rapid market developments, are highly dependent on innovation (often through collaborative research and development) and are often not less suited to traditional methods of antitrust analysis.[7] Otherwise, competition law enforcement would unnecessarily inhibit innovation and the achievement of dynamic efficiencies, which themselves are stated goals of competition policy.

The key is to find the appropriate balance between competition laws and IP rights that promote innovation, achieve maximum efficiency and, at the same time, protect consumers from anti-competitive behaviour.

The right to exclude others is the basis of the notion of private property rights. The right granted by a patent to a patent owner to unilaterally exclude others from enjoying that property is thus a confirmation that IP rights are to be treated just as any other property. Competition laws should also therefore, to the extent possible, treat IP rights as they treat any other form of property. Such an approach ensures consistency with that under IP laws and provides businesses with a degree of certainty and predictability.

The US Licensing Guidelines confirm that "for the purposes of antitrust analysis, the Agencies regard intellectual property as being essentially comparable to any other form of property."[8] Similarly, the

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5 Thomas O. Barnett, Assistant Attorney General, Antitrust Division, Department of Justice, Interoperability between Antitrust and Intellectual Property (Sep. 13, 2006).

6 Id.

7 Prepared Remarks of Robert Pitofsky Chairman Federal Trade Commission, Antitrust Analysis in High-Tech Industries: A 19th Century Discipline Addresses 21st Century Problems, American Bar Association Section of Antitrust Law's Antitrust Issues in High-Tech Industries Workshop (February 25-26, 1999 Scottsdale, Arizona).

8 Para 2.0, US Licensing Guidelines.

Canadian IPEGs state, "the analytical framework that the Bureau uses to determine the presence of anti-competitive effects stemming from the exercise of rights to other forms of property is sufficiently flexible to apply to conduct involving IP, even though IP has important characteristics that distinguish it from other forms of property."[9]

The principle that IP rights are to be treated no differently from any other form of property for the purposes of competition law analysis has been called the "bedrock principle" of competition enforcement policy[10] and means simply that IP rights are neither particularly free from competition scrutiny nor particularly suspect.[11]

2. Grant of a Patent Does Not Give Rise to a Presumption of Market Power

A corollary of the principle that IP rights should be treated just as any other form of property for the purposes of competition analysis is that the mere ownership of a patent should not be presumed to grant the holder market power.

The mere possession of an IP right does not mean that the holder possesses market power as that term is used in a competition law analysis. A patented product, for instance, may have a number of close substitutes, and the "relevant market" for competition law purposes may incorporate some or all of these substitutes resulting in the patent holder having no ability to unilaterally influence prices. In any event, regardless of whether or not acceptable substitutes are available, the outcome of the antitrust analysis should not depend solely on the scope of the rights granted by the patent.

The US Supreme Court has recently clarified that the mere possession of a patent does not give rise to a presumption of market power.[12] The Supreme Court stated:

> Congress, the antitrust enforcement agencies, and most economists have all reached the conclusion that a patent does not necessarily confer market power upon the patentee. Today, we reach the same conclusion, and therefore hold that, in all cases involving a tying arrangement, the plaintiff must prove that the defendant has market power in the tying product.

Both the US Licensing Guidelines as well as the Canadian IPEGs note that the respective competition authorities do not presume that the mere holding of an IP right creates market power in the competition context.[13] The US as well as the Canadian competition authorities require the traditional competition analysis of defining the relevant market and taking into account other factors that determine the effects of the IP right on the market such as market concentration, entry barriers and technological change.[14]

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9 Part 1, Canadian IPEGs.

10 Anne K. Bingaman, "The Role of Antitrust in Intellectual Property", speech by the Assistant Attorney General, US Department of Justice Antitrust Division before the Federal Circuit Judicial Conference, June 16, 1994; more recently, see R. Hewitt Pate, "Competition and Intellectual Property in the US: Licensing Freedom and the Limits of Antitrust", presented by the Assistant Attorney General, US Department of Justice Antitrust Division at the 2005 EU Competition Workshop, Florence, June 3, 2005.

11 Para 2.1, US Licensing Guidelines.

12 Illinois Tool Works, Inc. v. Independent Ink, Inc., 126 S. Ct. 1281 (2006).

13 Para 2.0, US Licensing Guidelines, para 4.1, Canadian IPEGs.

14 Para 2.2, US Licensing Guidelines, para 4.1, Canadian IPEGs.

Similarly, the EC Guidelines note that there is no presumption that intellectual property rights and licence agreements as such give rise to competition issues.[15] The guidelines state that the assessment of whether a license agreement restricts competition must be made within the actual context in which competition would occur in the absence of the agreement with its alleged restrictions, taking into account the likely impact of the agreement on inter-technology competition and on intra-technology competition.[16] Analysis of whether IP rights restrict competition in effect involves defining the relevant market and examining and assessing the nature of the products and technologies concerned, the market position of the parties, the market position of buyers, the existence of potential competitors and the level of entry barriers.[17] Moreover, the exceptions to antitrust scrutiny that are available in respect of all other forms of property, namely, that market power that is gained solely by virtue of possessing a superior product or process, innovative business practice or acumen, by historical accident or by other reasons for exceptional performance is not considered objectionable.[18]

3. Patent Holders Should Be Able to Refuse to License

The ability to refuse others the use of a patented invention is an integral part of treating patent rights as a form of property. Licensing is the usual method by which a patent holder authorizes others to use the IP. US, Canadian as well as European competition authorities have recognised that licensing can have pro-competitive benefits since they promote broader and more efficient exploitation of an IP, benefiting consumers through the reduction of costs and the introduction of new products.[19]

Businesses should therefore, generally, have the freedom to determine the circumstances and terms under which they would like to license, and correspondingly refuse to license, their IP rights.

The US Supreme Court has recently expressed its disfavour for compelling persons, even monopolies, to share their advantage with others, noting that such compulsion may lessen incentives to invest, require courts to act as centralized planners, and may even facilitate collusion between competitors.[20] BIAC supports this position – businesses should be allowed, and indeed encouraged, to create and protect any advantage that they gains in the form of IP rights rather than be forced to share this advantage with their competitors. Such an approach encourages innovation and ultimately consumer welfare.

The courts in Europe also appear to be tending towards this approach, even as they have confirmed that the so-called "essential facilities" doctrine can, in fact, be invoked under certain circumstances.[21]

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15 Para 9, EC Guidelines

16 Para 11, EC Guidelines

17 Para 16, EC Guidelines

18 Id.

19 Para 2.3, US Licensing Guidelines; para 4.1, Canadian IPEGs, para 5, paras 9 and 17, EU Guidelines; European Commission, Commission Regulation (EC) No 772/2004 of 27 April 2004 on the application of Article 81(3) of the Treaty to categories of technology transfer agreements, paras 5 and 6 ("Technology Transfer Block Exemption").

20 Verizon Comm., LLP v. Law Offices of Curtis V Trinko, 124 S. Ct. 872 (2004) 9.

21 See, IMS Health v. NDC Health, [2004] ECR I-5039. The European Court of Justice stated that a refusal to license a copyright "cannot in itself" constitute an abuse of dominant position. The court also laid down the following conditions that must be fulfilled before an action based on the 'essential facilities' doctrine can be successful: (i) the refusal to license prevents the emergence of a new product for which consumer demand exists; (ii) the refusal is not justified by any objective considerations; (iii) the refusal excludes competition in a 'secondary market'. It has been noted that fulfilling all these conditions could be a very

The Canadian Competition Tribunal and the Canadian IPEGs expressly state that the exercise of the IP right to exclude is not an anti-competitive act.[22] Similarly, the US Licensing Guidelines recognise that even the existence of market power does not impose on the IP owner an obligation to license the use of the IP.[23]

As the Canadian IPEGs point out, the competitive harm must stem from something more than just the mere refusal to license.[24] Determining whether something more than the mere refusal to license has occurred involves adopting the same approach in the case of IP rights as with any other form of property, and includes identifying the relevant conduct, defining the relevant markets, determining if the firm involved exercises market power, determining the nature of the harm to competition and considering any mitigating factors.[25]

4. Need to Encourage Harmonisation

Businesses increasingly operate on a global scale across continents. Since there is no uniform global competition law, it is important for competition laws to adopt a harmonised approach to the extent possible. The lack of harmonisation in the competition law context has come to the fore at times, particularly in transatlantic transactions.[26] However, competition authorities are increasingly cooperating with each other to ensure compatible results to the extent possible.[27]

In the context of IP rights, the different approaches adopted by the US competition authorities and the European competition authorities recently came to light in the proceedings against Microsoft's alleged anti-competitive behaviour. The European Commission has imposed more interventionist remedies than the United States that require greater sharing of IP rights.[28]

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difficult standard to meet: Gerald F. Masoudi, "Intellectual Property and Competition: Four Principles for Encouraging Innovation", presented by the Deputy Assistant Attorney General, US Department of Justice Antitrust Division at the Digital Americas 2006 Meeting, April 11, 2006.

22 Para 4.2.1, Canadian IPEGs; DIR v. Tele-Direct (Publications) Inc. and Tele-Direct (Services) Inc. (1997), 73 C.P.R. (3d) 1 and DIR v. Warner Music Canada Ltd. (1997), 78 C.P.R. (3d) 321.

23 Para 2.2, US Licensing Guidelines.

24 Para 4.2.1, Canadian IPEGs.

25 See, para 4.1, Canadian IPEGs.

26 See, for instance, the GE/Honeywell merger where the US competition authorities approved the proposed merger, but the EU authorities declined permission: in the US, see, US DOJ Press Release dated May 2, 2001, and in the EU, see, Case COMP/M.2220, 3 July 2001.

27 See, for instance, the GE/Instrumentarium merger where the EU and the US competition authorities worked together during the investigation and to harmonize the terms of the required remedies: in the EU see Case COMP/M.3083 GE/Instrumentarium, 28 Feb 2003, and in the US see United States v. General Electric Co., Civ. No. 03-1923 (DDC), 23 Feb 2004; and the Ciba-Geigy/Sandoz merger where the Canadian Competition Bureau agreed that remedies adopted by the US FTC eliminated the need for it to impose any separate remedy: in the US see the FTC Press Release dated December 17, 1996, and in Canada see the Canadian Competition Bureau Annual Report 1996/97.

28 In the EU see Commission v. Microsoft, COMP/C-3/37.792 (Commission Decision), 24 March 2004, and in the US see United States v. Microsoft, 231 F. Supp. 2d 144 (D.D.C. 2002). See also, Calvin S. Goldman, Q.C., Richard F.D. Corley and Crystal L. Witterick, A Canadian Perspective on Intellectual Property Rights and Competition Policy: Striving for Balance and Related Comity Considerations, 31st Annual Conference on International Antitrust Law & Policy (Oct. 7 & 8, 2004).

For businesses, consistency in the decisions of regulatory authorities across borders is vital since harmonization significantly reduces the cost of doing business and makes firms more competitive. Efforts to arrive at a common understanding of competition law principles and their interpretation through agencies such as the International Competition Network (ICN) are therefore welcome.

5. Summary

In summary, patent laws and competition laws are aimed at achieving the same goals – innovation, enhanced economic efficiency and greater consumer welfare. While they may at time appear to be in opposition with each other, each has its utility to society and its place in valid economic policy.

PRESENTATION BY BRONWYN H. HALL

Patents and innovation *(and competition)*

Bronwyn H. Hall

UC Berkeley, U of Maastricht, NBER, and IFS London

Patent system as viewed by a "two-handed" economist

Effects on	Positive	Negative
Innovation	creates an incentive for R&D and innovation investments	impedes the combination of new ideas & inventions; raises transaction costs; inhibits cumulative invention
Competition	facilitates entry of new or small firms with limited assets; enables vertical disintegration	creates short-term monopolies, which may become long-term in network industries

Traditional (simplistic) view of patents

- Trade off limited term right to exclude (monopoly) in return for incentive to innovate (and reveal)
  - Good for innovation
  - Bad for competition
- But……

Patents may help competition

- Increase dynamic competition by facilitating entry
  - Useful for securing financing in knowledge-intensive industries (where there are few tangible assets)
- Can lead to competition-enhancing vertical disintegration by facilitating trade in technology (specialization; interface standardization)
  - Chemicals - Arora, Fosfuri, Gambardella
  - Semiconductor design firms – Hall & Ziedonis

Patents may inhibit innovation

- The patent thicket – problem of contracting when many inputs are essential
  - High transaction costs lead to breakdown (Heller-Eisenberg)
  - Negotiations fail due to holdup (Scotchmer)
- Large numbers of patents in a given area, impossibility of adequate search
  - Ex post holdup by patentholder after costs are sunk (many examples)
  - Given litigation costs, even "invalid" patents can be enforced

When do patents encourage innovation?

- Theory
  - One patent/one product/static – yes
  - One patent/one product/cumulative innovation – yes, but licensing has some problems
  - Many differentiated patents/products with cumulative innovation – not if the distribution of value has a "thick" upper tail (Bessen and Maskin 2006)

When do patents encourage innovation?

- Evidence
  - Historical investigations of changes in patent systems
  - Recent look at software/business method patents in the US
  - Firm surveys

Historical evidence

- 19 century (variation across Europe/US)
  - Moser (2005) finds little effect on overall innovation, but change in focus
  - Lerner (2001) finds increase in patenting by foreigners but no increase by firms within country or in Britain (that is, no increase in innovation)
- 20th century
  - Park and Ginarte – 60 countries, 1960-90. Strength of IPR (including coverage of pharma) positive for R&D in developed countries
  - Branstetter & Sakakibara – increasing patent scope in Japan (1988) did not increase R&D
  - Baldwin et al – Canadian innovation survey. Innovation causes patenting, but patenting does not seem to increase innovation

Software patents in the US

- 1994/1995 CAFC decisions led to USPTO guidelines in May 1995
  - Market value of software firms (esp. applications) initially falls
  - However, software patents are more valuable than other patents to the firms that own them post-1995
  - In general, firms are less likely to enter product classes in which there are more software patents
  - However, firms that hold software patents are more likely to enter these markets and less likely to exit

Survey evidence

- Industrial R&D managers in the US
  - Yale survey (Levin, Klevorick, Nelson, and Winter 1983)
  - Carnegie-Mellon survey (Cohen, Nelson, and Walsh 1994)
- EU innovation surveys
  - 1993 CIS for Norway, Germany, Luxembourg, the Netherlands, Belgium, Denmark, and Ireland – 2,849 R&D-performing firms (reported in Arundel 2001)

US surveys

Effectiveness of Appropriability Mechanisms for Product Innovations (% of respondents)					
Mechanism	1st	2nd	3rd	4th	5th
Yale Survey 1983					
Patents	5	6	20	13	
Secrecy	0	0	19	25	
Lead time	17	21	6	0	
Sales & service	24	19	1	0	
Carnegie-Mellon Survey 1994					
Patents	3	4	5	12	20
Secrecy	14	14	7	8	1
Lead time	22	6	10	4	2
Sales & service	3	9	11	15	6
Manufacturing	4	14	13	7	6

US surveys

Effectiveness of Appropriability Mechanisms for Process Innovations (% of respondents)					
Mechanism	1st	2nd	3rd	4th	5th
Yale Survey 1983					
Patents	3	6	8	27	
Secrecy	5	14	21	4	
Lead time	32	7	5	0	
Sales & service	6	22	11	5	
Carnegie-Mellon Survey 1994					
Patents	0	5	4	14	21
Secrecy	28	8	6	1	1
Lead time	6	10	19	7	2
Sales & service	1	2	10	21	10
Manufacturing	12	22	8	2	0

1993 CIS (Arundel 2001)

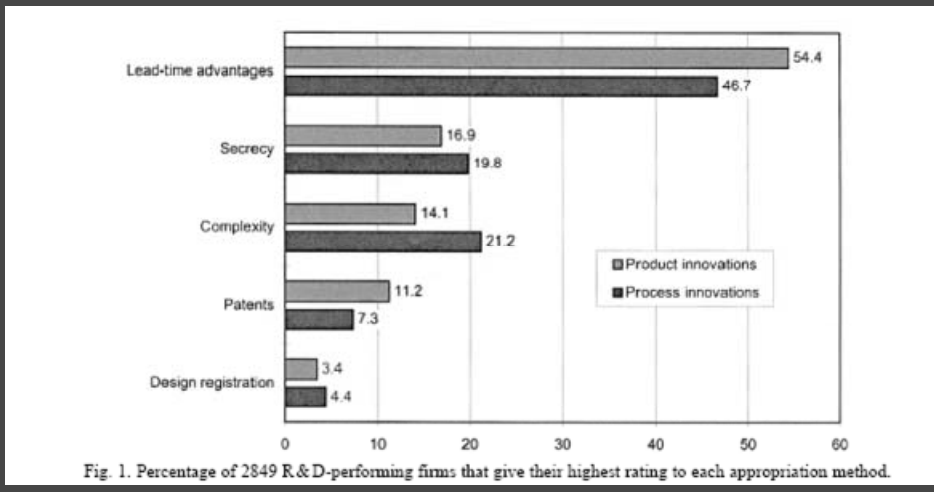

Fig. 1. Percentage of 2849 R&D-performing firms that give their highest rating to each appropriation method.

Where are patents effective?

- US - product:
  - 1983: drugs, plastics, chemicals; steel, pumping equipment, auto parts, measuring devices, medical instruments
  - 1994: medical instruments, drugs, special purpose machinery, auto parts
- US - process:
  - 1983: drugs, oil, chemicals, plastics, steel, pumping equipment
  - 1994: none, but drugs, oil, medical instruments highest
- Europe
  - 2000: chemicals (40% rate them first), pharma not included

A useful taxonomy

- "discrete" product industries
  - food, textiles, chemicals including oil and plastics, pharmaceuticals, metals, and metal products
  - patents used to exclude, and sometimes for licensing; also to prevent litigation
- "complex" product technologies
  - machinery, computers, electrical equipment, electronic components, instruments, and transportation equipment
  - patents used in negotiations (cross licensing and other), and to prevent litigation
- In general, patents more important for appropriability in discrete product industries
- Strategic uses (cross licensing, negotiations) greater in "complex" product industries

October 2006 OECD - Paris 15

Conclusions

- The role of patents in encouraging innovation is ambiguous
  - Positive on balance in discrete product industries
  - Neutral or negative in complex product industries
  - BUT considerable heterogeneity within industry
- Patents may actually help competition if they facilitate entry or leapfrogging

October 2006 OECD - Paris 16

Patent vs competition policy

- Patent offices normally attempt to apply a uniform standard of patentability across industries and technologies
  - Little economic analysis of cost and benefit
- Competition authorities rely on “rule of reason” in making decisions involving patents
  - Based on economic cost/benefit analysis
- Does this make sense?
- What are the implications for patent policy?

Patent policy reforms

- Raise the bar – higher inventive step, stricter non-obvious standard
  - Helps quality, by reducing numbers
  - Benefit/cost ratio likely to be larger for higher step
  - Reduces size of thicket
- Assess damages on proportional basis (to contribution to product), especially if asserter is not working the patent
- Some specifically US reforms

TECHNOLOGICAL INNOVATION AND MONOPOLIZATION

AAI WORKING PAPER 05-07

ABSTRACT

by F.M. Scherer, Harvard University Emeritus

AAI Working Paper 05-07

ABSTRACT

TECHNOLOGICAL INNOVATION AND MONOPOLIZATION

AUTHOR: F.M. Scherer, Harvard University Emeritus

This paper reviews the history of seven "great" U.S. monopolization cases in high-technology fields: Standard Oil (1911), the electric light cases, the AT&T cases, cellophane, Xerox, IBM, and Microsoft. It analyzes the extent to which innovativeness was a successful defense to monopolization charges, the success of remedies in correcting monopoly problems, their impact on incentives for continuing innovation, and the ability of the courts to deal with complex high-technology issues. It concludes that the courts are indeed capable of analyzing innovation - monopolization tradeoffs, but that the process has typically taken far too long, and in the mean time, secure monopoly positions tended to delay, not accelerate, innovation. Changes are proposed for adjudication procedure, notably, greater use of court-appointed experts, and in the duration of patent-based monopolies.

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TECHNOLOGICAL INNOVATION AND MONOPOLIZATION

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1. Introduction

Especially in industrial product markets, dominant positions are often achieved as a consequence of innovation. In passing the Sherman Act, Congress used without precise definition the word "monopolize" to indicate in Section II how the new law would be violated. From the Congressional debates, it is clear that more was required than merely possessing a monopoly market share. Some antitrust scholars have argued along with economist Joseph A. Schumpeter that when a monopoly position follows from or is accompanied by technological innovation, all Sherman Act bets should be off, in part because temporary monopoly is a natural concomitant of innovation and also because the "creative destruction" associated with innovation inexorably threatens existing monopolies and forces them to behave competitively:[1]

> But in capitalist reality as distinguished from its textbook picture ... the kind of competition which counts [is] the competition from the new commodity, the new technology, the new source of supply, the new type of organization (the large-scale unit of control for instance) -- competition which commands a decisive cost or quality advantage and which strikes not at the margins of the profits and the outputs of the existing firms but at their foundations and their very lives.... [Such] competition ... acts not only when in being but also when it is merely an ever-present threat. It disciplines before it attacks. The businessman feels himself to be in a competitive situation even if he is alone in his field or if, though not alone, he holds a position such that investigating government experts fail to see any effective competition...

This chapter traces the nonlinear path over which Sherman Act Section II adjudication has evolved for situations in which technological innovation played a prominent role. Ignoring Justice Holmes' admonition that "Great cases like hard cases make bad law,"[2] it addresses the issues by reviewing the history of several "great" U.S. monopolization cases: Standard Oil (1911), the various electric lamp cases, the diverse antitrust actions involving AT&T, the Cellophane case, the Xerox case, the IBM cases, and the various Microsoft cases.

The emphasis is on questions explored at a more abstract and general level in the extensive economic literature on dynamic relationships between market structure and incentives for innovation.[3] Thus, did

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1 Joseph A. Schumpeter, Capitalism, Socialism and Democracy (New York: Harper, 1942), pp. 84-85.

2 Dissent in U.S. v. Northern Securities Co., 193 U.S. 197, 400 (1904).

3 For surveys, see Jennifer F. Reinganum, "The Timing of Innovation: Research, Development, and Diffusion," in Richard Schmalensee and Robert D. Willig, Handbook of Industrial Organization (Amsterdam: North-Holland, 1989), vol. I, pp. 849-908; Wesley M. Cohen and Richard C. Levin,

dominant positions result from acts of unambiguous technological leadership? Or did the seminal inventive activities originate in a wider array of enterprises, from which one firm emerged dominant by dint of either technical superiority or other less clearly laudable courses of conduct? Once dominance was achieved, did innovation continue at high levels of vigor?

The intrinsic difficulty of these questions forces us to ask whether the adjudicating courts can cope effectively with the factual issues arising in innovation-plus-monopolization cases. Can they weigh on a timely basis the causal role of technical superiority as compared to practices that by themselves would support an inference of monopolistic intent? And can they devise remedies that restore competition without jeopardizing incentives for innovation?

This is an ambitious agenda. It is too ambitious to expect final, definitive answers. The author has struggled with some of the issues for four decades, only to conclude that the most favorable environment for technological progress depends upon nuanced circumstances. The most we can hope for is an indication of general tendencies, some suggestions for improvement, and clarification of issues that will continue to be debated. We proceed in rough chronological order.

2. Standard Oil

To the 21st Century reader, characterizing petroleum refining as high-technology might seem strange. But in its early days, the industry indeed pressed the frontiers of technology. And Standard Oil defended itself, arguing inter alia in its attorneys' brief to the Missouri circuit court that it had innovated both technologically and in the scale economies-enhancing investments by which it aggressively expanded its business:

> They have been unremitting in their efforts to improve the processes of refining, to diversify the useful by-products to be obtained from the refining of petroleum and to introduce them into general use, and these efforts have resulted to their great advantage as well as to the general benefit of the industry and the public at large.... They have made great efforts to solve the problem of refining refractory oils and through the success of these efforts they have been able to utilize to their great advantage oils that otherwise were useless except for fuel purposes.[4]

Emphasized among Standard's innovative accomplishments was the Frasch-Burton process for deriving satisfactory illuminating oil (kerosene) from the high-sulphur oil found in the fields around Lima, Ohio.[5]

One of America's most eminent business historians, Alfred Chandler, argues in an early book that Standard Oil was a leader in the "mass production revolution," and that "the high speed of throughput and the resulting lowered unit cost gave John D. Rockefeller his initial advantage in the competitive battles ...

"Empirical Studies of Innovation and Market Structure," in ibid., vol. II, pp. 1059-1107; and William M. Baldwin and John T. Scott, Market Structure and Technological Change (Chur, Switzerland: Harwood, 1987).

4 Brief for Defendants on the Facts, U.S. v. Standard Oil Company (New Jersey) et al., vol. I, pp. 109, 104.

5 Hermann Frasch emigrated to the United States in 1868 at the age of 17 and was employed thereafter by diverse Cleveland area companies. His first patent assigned to Solar Refining, a Cleveland-based Standard affiliate, appears to have been issued in 1891. He previously invented a more famous process for mining sulphur. William Burton later invented the first successful thermal cracking apparatus.

during the 1870s."[6] In a later elaboration, stressing the "unprecedented cost advantages of the economies of scale and scope," he attributes a decline in unit refining costs from 1.5 cents per gallon, observed in 1885 for independent refineries having a daily processing capacity of 1,500 to 2,000 barrels per day, to 0.452 cents, realized in Standard's much larger refineries, with capacities of from 5,000 to 6,500 barrels.[7]

Reconsidering the Standard Oil case, Dominick Armentano stresses that refined petroleum prices fell significantly between 1880 and 1897 while Standard's output expanded strongly. From this he concludes that "In short, there was no restriction of supply, and monopoly prices were never realized, even during periods of high market share. Standard was a large, competitive firm in an open, competitive market." In this, however, he commits a fallacy repeated by other scholars. It is easy to show using economic theory that even the tightest of monopolies will expand output over time if the demand it is facing shifts to the right, e.g., because consumers learn the advantages of kerosene as an illuminant, as population grows, and as new geographic markets are reached. And with rightward-shifting demand, prices can fall even under complete monopoly conditions if economies of larger scale are realized and/or technological changes shift cost curves downward.[8] The key questions therefore are factual: how great were the scale economies realized by Standard vis a vis rivals, and to what extent did its innovative efforts contribute uniquely to the decrease in refining and transportation costs?

In adjudicating the Standard Oil case, the courts could not ignore Standard's claims of superior entrepreneurship. The Supreme Court observed, for example, that:

> [I]n a powerful analysis of the facts, it is insisted [by Standard] that they demonstrate that the origin and development of the vast business which the defendants control was but the result of lawful competitive methods, guided by economic genius of the highest order, sustained by courage, by a keen insight into commercial situations, resulting in the acquisition of great wealth, but at the same time serving to stimulate and increase production, to widely extend the distribution of the products of petroleum at a cost largely below that which would have otherwise prevailed, thus proving to be at one and the same time a benefaction to the general public as well as of enormous advantage to individuals.[9]

Nevertheless, both the Circuit Court of first instance and the Supreme Court manifestly failed to address and resolve the contending claims. The Supreme Court at least admitted the task's difficulty:

> [T]o discover and state the truth concerning these contentions both arguments call for the analysis and weighing ... of a jungle of conflicting testimony covering a period of forty years, a duty difficult to rightly perform and, even if satisfactorily accomplished, almost impossible to state with any reasonable regard to brevity.[10]

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6 Alfred D. Chandler Jr., The Visible Hand: The Managerial Revolution in American Business (Harvard University Press: 1977), p. 256.

7 Alfred D. Chandler Jr., Scale and Scope: The Dynamics of Industrial Capitalism (Harvard University Press: 1990), pp. 25, 21. For my argument that such cost savings were too great to stem from scale economies alone and Chandler's rebuttal, see the Colloquium in the Business History Review, vol. 64 (Winter 1990), pp. 694-695 and 737-738.

8 This is most uniformly true when demand curve shifts are iso-elastic, i.e., when the quantity demanded at any price is multiplied by a constant. Exceptions can readily arise when the shift is parallel -- a case common in textbook analyses, but less common in the real world than iso-elastic shifts.

9 Standard Oil Co. v. United States, 221 U.S. 1, 48 (1911).

10 Ibid.

Instead, asserting from historical and legal reasoning "an obvious truth" that individuals should not be allowed to secure monopolies by wrongful means, the Circuit Court concluded summarily, "Nor can arguments of reduced prices of product, economy in operation, and the like have weight," commencing its remedial order only two paragraphs later.[11] Similarly, without engaging in the kind of balancing a modern rule of reason analysis might entail, the Supreme Court found that:

> [Standard's] very genius for commercial development and organization which ... was manifested from the beginning soon begot an intent and purpose to exclude others which was frequently manifested by acts and dealings wholly inconsistent with the theory that they were made with the single conception of advancing the development of business power by usual methods, but which on the contrary necessarily involved the intent to drive others from the field and to exclude them from their right to trade and thus accomplish the mastery which was the end in view.[12]

And as a result, Standard Oil was broken into 34 fragments, partly delineated by function (e.g., crude oil production, transportation, or refining) and partly geographically.

One might speculate that the courts in Standard Oil attempted no balancing of the evidence on innovation and cost reduction because the job had been done for them, despite the evident lack of judicial gratitude, in a massive study the Bureau of Corporations completed two years before the Circuit Court delivered its opinion. The Bureau's staff observed inter alia that by far the largest declines in the margin between crude petroleum prices and refined product prices occurred between 1866 and 1872, "before the Standard can be said to have exercised any influence,[13] that in the first decade of the 20th Century there was very little difference between the unit costs of Standard refineries and those of its larger rivals (who, it argued, would have been even larger and joined by others but for Standard's restrictive practices),[14] and, on technological innovation:[15]

> It is a familiar fact that whenever any absolutely new industry springs up, particularly one of a complex character, the costs at the outset are exceedingly high and are rapidly reduced with the first few succeeding years.... It is doubtless true that the Standard Oil Company ... was able to secure economies somewhat greater than could have been secured by a number of smaller concerns. It is, however, absurd to contend that no further economies in the industry would have been brought about after 1873 in the absence of the Standard or a similar combination.... The reduction of cost, even by small concerns, has been due to the natural development of the industry and to the general progress of science and invention -- not to the enormous aggregation of capital.

Support for the Bureau's inferences on innovation is provided by an analysis of data the Bureau staff failed to consider (presumably because it was not fashionable in economics to do so at the time, as it is now). From Jacob Schmookler's compilation of U.S. patents issued in various fields, Figure 1 shows the

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11 U.S. v. Standard Oil Co., 178 Fed. 177, 196 (1909).

12 Supra note 9 at 76. In his dissent, Justice Harlan criticized the majority for articulating its "rule of reason" to adjudicate monopolization cases without any evident basis in Congressional intent.

13 Report of the Commissioner of Corporations on the Petroleum Industry, Part II, "Prices and Profits" (Washington: 1907), p. 625.

14 Ibid. pp. 650-655.

15 Ibid., pp. 625-626.

number of petroleum refining patents issued during five-year periods between 1850 and 1929, along with the amount of crude oil produced in the United States during the same periods.[16]

The plot is in logarithmic form, so a straight line implies a constant annual growth rate. The growth of patenting is most rapid before Standard Oil was incorporated and began acquiring competitors in 1870. By 1880, Standard had acquired at least 80 percent of U.S. refining capacity. During its period of dominance, patenting shows no growth and is at lower absolute rates than in 1865-69. After the dissolution of the New Jersey Standard Company in 1912, there is new growth and a substantial increase in the level of patenting.

More detailed scrutiny suggests that the core components of Standard Oil generated only a small share of the 363 refining patents identified in Schmookler's tabulation for the years 1880-1900. A search was conducted in the Patent Office's Annual Index of Patents covering those years for any patent assignment to an entity with the name "Standard Oil..." plus Anglo-American Oil, Atlantic Refining, Ohio Oil, South Penn Oil, and Solar Refining -- subsidiaries included under Standard's 1882 trust.[17] Only 34 patents, or 9.4 percent of the comparable Schmookler count, could be traced to those Standard entities. More than half of them were for inventions made by Hermann Frasch. It is possible that some inventions made by Standard employees were not assigned to the parent.[18] Additional patents were probably obtained by smaller companies acquired by Standard but not covered in the search. However, since the most important company affiliates were included, Standard's principal operating entities appear to have made few technological contributions other than those associated with Frasch.

There is qualitative support for inferring that Standard was not an outstanding technological innovator during its period of dominance. While the monopolization case was proceeding, the petroleum refining industry was subjected to two technological revolutions. The demand for kerosene illuminating oil -- its principal early product -- was threatened by the advent of electric illumination, but the emergence of the automobile created demand for gasoline, which until then had been a nearly worthless by-product of the refining process. In 1907, 8.0 percent of American homes were wired for electricity; by 1912, the figure had doubled and continued rising to 34.7 percent in 1920. In 1907, 43,000 passenger automobiles were produced; in 1912, 356,000; and after the first million-car year in 1916, factory sales reached 1.9 million in 1920. Using traditional methods, petroleum refiners were hard-pressed to extract enough gasoline to meet the burgeoning demand. A new process for obtaining a much higher fraction of gasoline from a barrel of crude oil -- thermal cracking -- was invented around 1909 by William Burton, co-inventor earlier of the Frasch process and in 1909 head of production at Standard Oil Company of Indiana. Indiana Standard applied to Standard headquarters in New York for authorization to spend $1 million developing and

16 Jacob Schmookler, Statistics of Patents Classified by Industry, United States, 1837-1957, Part II, for Patent Office classes 325 through 332 (undated, mimeographed, University of Minnesota).

17 The search was hindered by the deteriorated condition of the Index of Patents volumes located in the Patent Office's public search room. The volumes for 1879, 1880, and 1885 were so badly fragmented that systematic consultation was infeasible. Contrary to the original research plan, no search was conducted over a broader list of 52 Standard affiliates, mostly small, for fear of doing further damage to the brittle pages.

18 However, non-assignment could not have been a uniform policy, since assignments were found for several core Standard companies throughout the period. A check for the earlier years 1876-1879 disclosed one patent assigned to William Rockefeller, John D. Rockefeller's brother and business associate. Several additional Standard Oil assignments are not counted here because they were for non-refining inventions -- most of them pertaining to container designs and manufacturing techniques.

installing thermal crackers. The request was turned down; the invention was considered too dangerous.[19] Only when Standard of Indiana became independent in 1912 could the project go forward. The Burton process was widely licensed. Between 1913 and 1920, when competing cracking processes began to emerge, 91 million (42 gallon) barrels of gasoline had been refined using the Burton process.[20]

3. The Electric Lamp Industry

If the kerosene lamp repelled the forces of darkness, electric illumination vanquished them. Thomas Edison, every American school child knows, is the one who struck the decisive blow. But the truth is more complex. By the 1870s, the scientific knowledge base required for an incandescent lamp had evolved to a state under which, given the powerful demand for low-cost illumination, the "invention" of electric lamps had become virtually inevitable.[21] Thus, carbon filament lamps were conceived almost simultaneously between 1879 and 1881 by a number of individuals, including Edison, Great Britain's Joseph Swan (who had experimented with filament lamps as early as 1848), and others. Edison had two advantages: he more than any other perfected an entire system for electric lighting, and he sought patents aggressively. Erroneously believing that patenting was precluded by prior art, Swan lagged Edison in seeking patents. Nevertheless, many companies entered the new business, and a tangle of potentially interfering patents materialized.

The strategies of Edison and the General Electric Company, the successor to the various Edison companies formed in 1891, included vigorous acquisition of other inventors' key patents, restrictive cross licensing of patents when outright acquisition was not possible, merger with competing companies producing electric lamps and ancillary equipment, and, leveraging from a powerful patent position, organization of both national and international cartels.[22] By 1896, General Electric and its cross-licensee Westinghouse dominated the U.S. industry with a combined 75 percent market share, surrounded by a fringe of licensed and unlicensed (typically short-lived) smaller rivals. In 1896 General Electric took the lead in organizing the Incandescent Lamp Manufacturers trade association, which fixed prices, allocated customers, and assigned each member a maximum percentage quota oriented around GE's sales. Cross licenses with European rivals limited the participating companies to their agreed-upon national spheres of influence. As the basic Edison and complementary patents expired, General Electric sustained its dominant position and its ability to orchestrate the cartel through further acquisitions of key patents and rival companies. When the expiration of carbon filament lamp improvement patents weakened its position and after European companies had blazed the trail by introducing lamps with metal (e.g., tungsten and tantalum) filaments, General Electric caught up by developing between 1904 and 1907 superior lamps with ductile tungsten filaments, to which the advantages of argon gas filling were later added.

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19 See Daniel Yergen, The Prize (New York: Simon & Schuster, 1991), pp. 111-112; and George S. Gibb and Evelyn H. Knowlton, History of Standard Oil Company: The Resurgent Years: 1911-1927 (New York: Harper, 1956), pp. 116-117. Gibb and Knowlton observe more generally at p. 123 that "Little creative research of an important nature ... was undertaken" by New Jersey Standard.

20 John L. Enos, Petroleum Progress and Profits: A History of Process Innovations (M.I.T. Press, 1962), Appendix Table 1a.

21 See William F. Ogburn and D. S. Thomas, "Are Inventions Inevitable?" Political Science Quarterly, vol. 37 (1922), pp. 83-98; and F. M. Scherer, "Economics of Innovation and Technological Change," International Encyclopedia of the Social and Behavioral Sciences (2001), vol. 11, pp. 7531-7533.

22 The most comprehensive source on this history is Arthur A. Bright Jr., The Electric Light Industry (New York: Macmillan: 1949). Edison withdrew from the active management of his electric light companies in 1884.

The first government attack on the lamp cartel was initiated in March 1911, two months after the Supreme Court's Standard Oil decision. A consent decree entered on October 12, 1911, enjoined many of the cartel's practices. However, following precedents confirmed in the Bement case,[23] the consent decree did not restrict GE's ability to acquire competing patents or its ability to specify in patent licenses the prices at which the licensees sold their bulbs, assign them market share quotas, and limit the kinds or sizes of lamps they could supply. It did, however, prevent GE from stipulating the prices its own and licensees' downstream distributors could charge. General Electric and Westinghouse circumvented this restriction by designating their retailers as agents, maintaining de jure property rights in the patented lamps carried in retailers' inventories. With restrictive license terms and the agency system substituting for the earlier cartel arrangements, the electric lamp cartel was minimally discommoded. General Electric's share of U.S. lamp production in 1923 was estimated to be 61 percent; Westinghouse's share 16 percent; that of other licensees 9 percent, and other vendors (mostly specialized) 14 percent.[24]

The agency system was challenged under a new antitrust suit in 1924, but it was sustained as legitimate by a district court in 1925 and by the Supreme Court in 1926.[25] Among other things, the Supreme Court reiterated its Bement conclusion that fixing the prices at which direct licensees (e.g., Westinghouse) sold their products was a condition "normally and reasonably adapted to secure pecuniary reward for the patentee's monopoly" -- downplaying the fact that GE's patents were often acquired from would-be rivals in what was transparently an attempt to monopolize the field and that they were conditioned on a rich network of restrictive cross licenses.

Public attitudes toward patent-based cartels changed dramatically during the Great Depression of the 1930s. The failure of the cartel-friendly National Recovery Administration (NRA) to restore prosperity was one reason. Investigations by the Temporary National Economic Committee (TNEC) also altered policy-makers' perceptions, among other things by revealing in detail the stranglehold the Hartford Empire Company and its bottle-making licensees had secured over the glass container industry. At an American Economic Association symposium reviewing the TNEC's findings, later Nobel laureate George

Stigler found Hartford Empire "an eloquent example of an evil demanding correction" and concluded flatly that "The case for limitation of restrictive licensing is surely irrefutable."[26] The TNEC findings spurred the Department of Justice to launch a broad investigation of patent system abuses and to initiate numerous complaints challenging patent practices. The electric lamp cartels, national and international, were one target. Westinghouse consented in 1942 to end its cartel participation and license its patents royalty-free, but for General Electric and some licensing partners who chose to fight the battle in court, prosecution was delayed until the end of World War II to avoid distracting executives' attention from the war effort.

In 1948, the U.S. Federal District Court for the Northern District of Ohio found that General Electric and its licensees had in fact violated Sections I and II of the Sherman Act. Weighing what had been accomplished to provide U.S. consumers with low-cost illumination against the restraints maintained, Judge Phillip Forman concluded:[27]

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23 Bement & Son v. National Harrow Company, 186 U.S. 70 (1902).

24 Bright, supra note 22 at 242.

25 U.S. v. General Electric Company et al., 272 U.S. 476 (1926).

26 George J. Stigler, "The Extent and Bases of Monopoly," American Economic Review, vol. 32 Supplement (June 1942), p. 14.

27 U.S. v. General Electric Co. et al., 82 F. Supp. 753, 905 (1948).

> The record of General Electric's industrial achievement has been impressive. Its predecessors pioneered the lamp industry and it organized through the years an establishment that stands as a model of industrial efficiency. ... By means of extensive research ... mechanical and technological advances were accomplished ... which made possible a progressive price reduction policy. ... It can take just pride in the more graphic statistic that the price of a 60 watt bulb was 45 cents in 1922 and 10 cents in 1942....
>
> On the other hand there can be no doubt that it paced its industrial achievements with efforts to insulate itself from competition. It developed a tremendous patent framework and sought to stretch the monopoly acquired by patents far beyond the intendment of those grants. It constructed a great network of agreements and licenses, national and international in scope, which had the effect of locking the door of the United States to any challenge to its supremacy in the incandescent electric lamp industry arising from business enterprise indigenous to this country or put forth by foreign manufacturers. Its domestic licenses gave fiat to a few licensees whose growth was carefully limited to fixed percentages of its own production and expansion so that over the years its share of the business was not materially diminished and its dominant position was never exposed to any hazard in that direction.

The remedial order was deferred to a subsequent stage, concluded in 1953. At the time, General Electric's share of domestic incandescent lamp production was estimated to be 60 percent. The government's petition that half of General Electric's principal lamp production capacity be spun off into a separate entity was denied. However, the restrictive agreements between General Electric and its domestic and foreign licensees were enjoined. General Electric had argued, citing a Supreme Court pronouncement in the Hartford-Empire case,[28] that it should receive appropriate compensation for any patent licenses it was required to issue. However, finding GE and its licensees to be "mounted upon an arsenal of a huge body of patents that can easily overwhelm and defeat competition by small firms," Judge Forman asserted what the Supreme Court had deemed in another compulsory licensing case "sound judicial discretion" and ordered that the lamp patents be dedicated to the public without compensation:[29]

> Royalty free licensing and dedication are but an extension of the same principle, not to be directed indiscriminately, of course, but well within the therapeutic measures to be administered under circumstances such as were made to appear in this case.

Thus, a patent monopoly position engendered when Thomas Edison received his basic carbon filament lamp patent in 1880 ended by judicial decree 73 years later. A Congressional survey found that as of January 1956, nine compulsory licenses had been issued by General Electric and eight by Westinghouse.[30] Price competition from both domestic and foreign sources has undoubtedly intensified since then. In 1985 imports rose to 10.9 percent of domestic firms' output value. The domestic industry structure, however, was not radically transformed; it continues to be a relatively tight oligopoly, with a four-firm concentration ratio of 93 percent in 1954 and 87 percent in 1992.

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28 Hartford-Empire Co. et al. v. U.S., 323 U.S. 386, 414 (1944).

29 U.S. v. General Electric Co. et al., 115 F. Supp. 835, 844 (1953).

30 Compulsory Licensing under Antitrust Judgments, Staff Report, Subcommittee on Patents, Trademarks, and Copyrights, Senate Committee on the Judiciary (Washington: 1960), p. 20.

4. AT&T

The early history of AT&T is remarkably similar to that of General Electric. Alexander Graham Bell filed his first telephone patent application on February 14, 1876. Patent no. 174,465 was approved three weeks later. Only a few hours after Bell's initial application was filed, Elisha Gray of Chicago filed a patent application for his own version of the telephone. Bell's first and subsequent patents were assigned to a series of companies that eventually became AT&T; Gray's to the powerful Western Union Company (which in August 1877 turned down an opportunity to purchase Bell's initial patent). Each company began installing or licensing newly-created local firms to install telephone networks. Given the conflicting claims resulting from third-party inventions, various infringement suits were initiated. They were eventually resolved in favor of the Bell derivative companies in a 4-3 decision of the United States Supreme Court.[31] In the mean time, Western Union had also purchased relevant patents from Amos E. Dolbear and Thomas A. Edison. These additional inventions were sufficiently superior to those of Bell that, despite Bell's purchase of an improved transmitter patent, Western Union "methodically beat [Bell] each time the two systems were in direct competition."[32]

Each company found itself threatened by the other's patent claims and telephone system investments. In November 1879 a settlement was reached. Under it, Western Union agreed not to contest the validity of Bell's patents, to cede exclusive rights for the construction and operation of telephone networks to the Bell companies, and to grant Bell rights in 42 existing and any subsequent telephone patents owned by Western Union. The quid pro quo was an agreement by Bell not to compete in the field of telegraphy and to pay between 1879 and 1896 20 percent of Bell's license revenues from its telephone operating company franchisees. In addition, Bell agreed to purchase Western Union's already existing telephone operations.[33]

To consolidate its patent position, the Bell derivative (AT&T predecessor) companies acquired a 40 percent interest in the Western Electric Company, which had been organized in 1856 to supply telegraph equipment to Western Union and which, when Western Union entered telephony, had made numerous additional telephony inventions. By 1883, AT&T had acquired majority control of Western Electric. Among other things, these actions prevented Western Electric from supplying telephone apparatus to other companies that might compete with the Bell affiliates.

Despite Bell's consolidated patent position, many other companies did try to enter the newly emerging telephone service and equipment supply industries. Bell's largely successful strategy in combatting them was to deny them Western Electric as an equipment supplier and to sue them for infringement when other equipment sources were tapped. Between 1877 and 1893, when the original Bell patent expired, roughly 600 infringement suits were brought. Most of the respondents promptly went out of business when challenged; only a few suits were pursued to the final Supreme Court decision of 1888.[34] With the expiration of another key Bell patent in 1894, however, Bell's ability to exclude competition merely on the basis of its extensive continuing patent portfolio was severely weakened. Again, new companies began providing telephone service, especially in smaller towns Bell had not yet entered but also some directly competing in the larger metropolitan areas. By 1902, there were 1.32 million Bell telephones in use and 1.05 million independent units.

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31 The Telephone Cases, 126 U.S. 1 (1888).

32 Joseph C. Goulden, Monopoly (Pocket Books: 1970), p. 35.

33 U.S. Federal Communications Commission, staff report, Report on Telephone Investigation (two volumes, mimeo, 1939), vol. I, pp. 183-185, 318, and 356. The early sections of this account rely heavily upon the FCC report.

34 Federal Communications Commission, supra note 29, p. 186.

AT&T (incorporated in 1885 and reorganized to control all Bell affiliates in 1900) pursued several strategies to restrain the growth of independent competition. It acquired from outside inventors additional patents, including Lee de Forest's basic triode amplifier tube patent. It continued to bring infringement suits, not all of them successful. Efforts to strengthen this barrier further by purchasing two particularly important equipment manufacturers who supplied the independent telephone companies were defeated by federal and state anti-merger actions in 1906 and 1907.[35] Having steadily increased the "long lines" connections among individual metropolitan telephone systems, AT&T denied interconnection to competing local operating companies and hence deprived them of network advantages.[36] With its superior access to financial capital and its network advantage of long lines interconnectivity, the Bell system engaged in an aggressive program of buying up competitive telephone companies. By 1912, Bell control of telephone sets in service had risen to 5.09 million, compared to 3.64 million associated with independent companies.[37]

AT&T's continuing efforts to acquire rivals and its refusal to interconnect those who remained independent, however, provoked antitrust intervention beginning in 1913. This led in late 1913 to the so-called Kingsbury commitment,[38] named after a vice president of AT&T. Under it AT&T agreed not to acquire control over any additional competing telephone service companies, to dispose of its controlling stock interest in Western Union (acquired in 1909), and to interconnect its inter-city and local networks with competing companies if they provided standardized connecting lines. The undertaking was modified in 1918 to permit Bell to acquire competing companies if the Bell system in turn spun off an equal number of telephone stations to independent companies. Some independent companies apparently protested that the Kingsbury commitment prevented them from selling out on advantageous terms to AT&T, and in 1921, after the passage of permissive legislation, the Department of Justice voided the commitment. As a result of these changes, the number of independent telephone sets peaked at 4.8 million in 1922 while Bell's network of sets rose to 9.5 million in 1922 and 13.7 million in 1927.

Even before the Kingsbury commitment was negotiated, some of Bell's restrictive policies were relaxed beginning with the return of Theodore Vail to the leadership of AT&T in 1907. Vail believed that telephone service should be a universal monopoly regulated by governmental authority at either the state or federal level. He was also concerned by escalating threats of antitrust intervention. Some (largely ineffective) regulation was exercised by the Interstate Commerce Commission beginning in 1910, replaced in 1934 by the creation of the Federal Communications Commission. Also, recognizing that Bell's ability to block independent competition through patent suits was weakening, Vail authorized Western Electric to begin selling equipment to the independent operators. The loss of leverage motivating independent companies to sell out to Bell in order to gain interconnection with Bell's long lines was apparently compensated by arbitrary toll revenue "divisions" that favored Bell, given the independents' need to connect with Bell in order to supply their patrons with comprehensive nationwide service.[39]

The emergence of radio technology posed a new threat to AT&T's increasingly dominant position. With its control of the de Forest triode patent and many improvement inventions, AT&T held a key

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35 Federal Communications Commission, supra note 33, at 204.

36 On network externalities, see Michael L. Katz and Carl Shapiro, "Systems Competition and Network Effects," Journal of Economic Perspectives, vol. 8 (Spring 1994), pp. 93-115.

37 Federal Communications Commission, supra note 33, at 208.

38 Federal Communications Commission, supra note 33, p. 208. Prior to 1913, 16 states had passed laws requiring interconnection, but some were undermined through technical incompatibilities.

39 Federal Communications Commission, supra note 33, at 213.

blocking position. But other companies had equally important patents on related aspects of radio technology. To ensure that advances in the military use of radio did not bog down through a welter of infringement suits, the U.S. Navy required in 1917 (as the United States entered World War I) that the principal patent holders cross-license their patents into a patent pool. After the war, the leading radio patent holders -- AT&T, General Electric, RCA (created as a patent-pooling entity in 1919), and Westinghouse entered into cross-licensing agreements, with each participant receiving exclusive rights to develop its strategic interests -- e.g., for AT&T, to use the patents for wire telephone and telegraph technology and public network radiotelephones. However, the rapid rise of radio broadcasting was not anticipated in the agreements. AT&T began setting up broadcasting stations, initially with WEAF in New York during 1922, and demanding that other radio broadcasters take licenses from AT&T calling for royalty payments and restrictions on the commercial sale of radio time. They initiated political countermeasures, leading Secretary of Commerce Herbert Hoover to declare in 1924:[40]

> I can state emphatically that it would be most unfortunate for the people of this country to whom broadcasting has become an important incident of life if its control should come into the hands of any single corporation, individual or combination.

This controversy led to arbitration over the terms of the original patent pool and eventually, in 1926, to a cross-licensing agreement modification under which AT&T sold its broadcasting operations to RCA and agreed to stay out of broadcasting in return for exclusive "pickup" rights to transmit programs between radio stations over its land telephone lines. The agreement provided that if AT&T failed to furnish the desired services, RCA could so. AT&T retained exclusive rights to all other applications of wire telephony, to commercial two-way radiotelephony operations within the United States, and to the provision of equipment used in the United States for transoceanic radiotelephone calls.[41] This agreement drew an antitrust challenge eventually settled in 1932. The revised agreement did little to restrict AT&T's ability to control its chosen fields.[42]

With a secure monopoly in telecommunications service and the supply of equipment to its operating companies, AT&T was, according to the FCC's 1939 staff report, slow in introducing such technological innovations as automatic dialing, monolithic handsets, anti-sidetone circuitry, and office switchboards with enhanced features.[43] Following World War II,[44] AT&T continued to delay the implementation of certain technological innovations despite the work of its Bell Telephone Laboratories, called by Fortune magazine in November 1958 "the world's greatest industrial laboratory," responsible among other things for the invention of the transistor,[45] the discovery of cosmic microwave background radiation presumably

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40 W. R. Maclaurin, Invention and Innovation in the Radio Industry (New York: Macmillan, 1949), p. 114.

41 See Federal Communications Commission, supra note 33, at 334-336; and Gerald W. Brock, The Second Information Revolution (Harvard University Press, 2003), pp. 36-38.

42 See Federal Communications Commission, supra note 33, at 340.

43 Federal Communications Commission, supra note 33, pp. 323-398 and 404-405.

44 For an analysis of ten postwar innovations showing rapid introduction in some monopoly cases (e.g., touch-tone dialing) but on average faster introduction under more recent competitive conditions, see Howard A. Shelanski, "Competition and Deployment of New Technology in U.S. Telecommunications," 2000 U. Chi. Legal Forum 85, 98-117 (2000).

45 For an obituary observing that a lack of competitive urgency slowed AT&T's use of Bell Laboratories inventions, see "AT&T Inventions Fueled Tech Boom, And Its Own Fall," Wall Street Journal, Feb. 2, 2005, p. 1. Remarkably, Bell Laboratories lagged Northern Telecom of Canada in the development of digital central office switches because Bell failed to extrapolate, consistent with Moore's Law, the future decline of integrated circuit prices. See F. M. Scherer, International High-Technology Competition (Harvard University Press: 1992), pp. 87-88.

resulting from "the Big Bang," a leading role in the invention of the laser, and shared development of optical fiber transmission cables. Delayed implementation occurred because Western Electric designs were favored over alternative equipment available on the outside market and through stringent interpretation of its tariff rules barring the attachment of "foreign devices" to Bell's lines and telephones. Examples included Bell's discontinuation of service to customers using answering machines and recording devices not designed by Western Electric; actions to discourage customers from using one-piece telephones, facsimile machines, designer telephones, and speakerphones available on the market; the insistence that large-volume customers use Bell-design office switchboards rather than allegedly superior models available from other sources; and actions taken to prevent the use of Hush-a-Phone (a device attaching to handset speakers to prevent bystanders from overhearing conversations) and the Carterphone, which permitted users to "patch" telephone calls back and forth into over-the-air radio communication devices, including ham radios. The Hush-a-Phone and Carterphone disputes led to regulatory proceedings before the FCC and litigation in the federal courts, precipitating escalating requirements that AT&T lessen its barriers to foreign attachments.[46]

Another exception to Bell's slow innovation pace is revealing. By the end of World War II, radio, radar, and radio tube technology had advanced to the point where transmitting large quantities of information using microwave radio had become feasible. At the same time, the rapid emergence of the television industry created a demand for the ability to carry broad-band TV signals for long distances between various parts of the country. To facilitate microwave technology, the Federal Communications Commission allocated blocks of the microwave radio spectrum for use by relay systems. By 1947, several companies, including Philco, Raytheon, Western Union, General Electric and IBM jointly, and DuMont had applied for microwave spectrum allocations and had either begun or were about to begin construction of experimental microwave relay networks.[47] These ventures were a serious threat to the Bell System's long-established monopoly position in the intercity transmission of all but telegraph signals. Bell responded by developing at record speed its TD-2 radio relay system, initiating service with a New York - Chicago link in September 1950.[48] It simultaneously retarded or blocked rival developments by staking claims to the most desirable relay locations, refusing to interconnect its microwave and telephone facilities with non-Bell microwave systems, and persuading the FCC to restrict the use of key spectrum blocks to common carriers. Through the "crash" TD-2 program, AT&T successfully defended most of its monopoly position in inter-city message transmission -- at least until later regulatory developments altered the environment in the 1960s.[49]

Eventually, however, AT&T's efforts to maintain its service and equipment near-monopoly positions induced aggressive antitrust intervention. A complaint was filed in 1949 seeking divestiture of Western Electric from AT&T, fragmentation of Western into three parts, and the end of other restrictive arrangements. Adjudication was delayed by the Korean war. In 1953, Secretary of Defense Charles E. Wilson sent to Attorney General Herbert Brownell a letter observing that the proposed divestiture of Western Electric "seriously threatens the continuation of important work which the Bell System is now

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46 Hush-a-Phone Corp. v. U.S., 238 F. 2d 266 (1956); in re Hush-a-Phone Corp., 22 F.C.C. 113 (1957); Carter v. AT&T Co., 250 F. Supp. (1966), aff. 365 F. Supp. 486 (1966), and in re Carterphone, 13 F.C.C. 2nd 420 (1968).

47 See Donald C. Beelar, "Cables in the Sky and the Struggle for Their Control," Federal Communications Bar Journal, vol. 21 (1967), pp. 27-37.

48 F. M. Scherer, "The Development of the TD-X and TD-2 Microwave Radio Relay Systems in Bell Telephone Laboratories," cleared case study, Harvard Business School Weapons Acquisition Research Project, October 1960.

49 Specifically, the FCC's "Above 890" decision in 1959 followed by the FCC's approval of MCI's radio relay system application in 1969.

carrying forward in the interests of national defense." It urged that "a mere postponement ... does not adequately protect the vital interests involved" and asked that the Justice Department review "how this potential hazard to national security can be removed or alleviated."[50] This paved the way for a consent settlement in 1956 requiring compulsory licensing of roughly 9,000 AT&T patents and limitations on third-party commercial product sales by Western Electric.[51] A Congressional investigation revealed later that the letter was drafted by Bell Laboratories president Mervin J. Kelly.[52] The Western Electric case was cited, along with more recent settlements involving the auto industry and various mergers, in Congressional hearings that led to the so-called Tunney Act, which requires publication of the rationale for antitrust consent decrees and judicial oversight of their provisions.[53]

How AT&T responded to post-1956 Federal Communications mandates allowing companies such as MCI and Datran to commence inter-city service competitive with AT&T and requiring it to interconnect "foreign devices" set the stage for a new monopolization complaint in November 1974. In addition to showing that AT&T and Western Electric held monopoly positions, the government alleged a laundry list of restrictive practices, including failure to interconnect competing carriers with its network on reasonable terms, discriminatory price reductions confined to the markets in which competition had emerged, and much else, which, it alleged, provided proof of intent to monopolize. The government sought divestiture of local Bell operating companies and Western Electric from AT&T and (more tentatively) fragmentation of Western Electric. A clumsily punctuated paragraph in the government's brief also implied that Bell Telephone Laboratories would be separated from the Western Electric manufacturing operations[54] -- a proposal which, if in fact intended, showed serious misunderstanding of how research and development are best conducted. AT&T replied inter alia that its monopolistic positions and the vertical integration of its operations resulted from conscious regulatory policies, and that the restrictive practices of which it was accused were approved, either actively or passively, by the Federal Communications Commission. They reflected among other things regulators' desire to preserve the integrity of the U.S. telecommunications network from technological failures and from "cream-skimming" behavior by new rivals exploiting an accepted uniform-price policy by entering only high-volume, low-cost segments. Equally importantly, there was what the AT&T brief called its "economic and technological defense:"[55]

> [T]he integrated structure of the Bell System which the Government seeks to destroy in this case, and the interactions and common purpose which that structure makes possible, have enabled the Bell System to provide the public with the finest telecommunications system in the world at rates that compare very favorably with those available in any other country.... The Bell System's price and quality performance has only been matched for its record of introducing innovative equipment better to fulfill its service mission.

After the government's case in chief was completed, AT&T moved for summary judgment. Placing little weight on the economic and technological defense, District Judge Harold Greene concluded that

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50 U.S. House of Representatives, Commitee on the Judiciary, Subcommittee on Antitrust, Consent Decree Program of the Department of Justice (Washington: 1958), Part II, vol. I, pp. 2029-2031.

51 U.S. v. Western Electric Inc. et al., CCH 1956 Trade Cases Para. 68,246 (1956).

52 Supra note 50, pp. 2015-2039.

53 U.S. Senate, Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, Hearings, Antitrust Procedures and Penalties Act (Washington: 1973), and Public Law 93-528 (December 1974).

54 Plaintiff's First Statement of Contentions and Proof, Civil Action No. 74-1698 (November 1978), p. 528.

55 Defendants' First Statement of Contentions and Proof Civil Action No. 74-1698 (January 1979), pp.44-45 and 436-437.

AT&T possessed monopoly power "notwithstanding regulation," adding his supposition that the Federal Communications Commission "may realistically be incapable of effectively regulating a company of AT&T's size, complexity, and power."[56] He ruled further, subject to possible rebuttal in the case's defense phase, that the evidence gave reason to believe that the Bell System had violated the antitrust laws over a lengthy period of time, citing in particular its conduct with respect to the connection of customer-owned equipment, intercity service competitors, and the procurement of equipment.

A series of surprises followed. Settlement negotiations already underway at the time of Judge Greene's decision were accelerated, and on January 8, 1982, AT&T and the government announced that they had reached a consent agreement. Twenty-two Bell companies providing preponderantly local telephone service were to be separated from AT&T and reorganized into an unspecified number (eventually, seven) of regional clusters (RBOCs, for Regional Bell Operating Companies). AT&T would retain the interstate service (Long Lines) part of its activities as well as Western Electric and Bell Telephone Laboratories. The parts retained by AT&T, the settlement's rationale implied, were activities that would be exposed to actual and potential competition, whereas the divested regional operating companies were considered to be natural monopolies which would continue to be regulated by the Federal Communications Commission and state authorities.[57] As in 1955, AT&T secured support from other government agencies against divestiture, but even President Reagan's cabinet was unwilling to prevent Assistant Attorney General Baxter from going forward.[58] Restraints from the 1956 consent decree barring Western Electric from commercial sales to non-Bell customers were relaxed, permitting Western Electric to enter the computer industry (which it later did, unsuccessfully) and merchant semiconductor sales. The divested operating companies were required to provide local connection access to AT&T and its rivals on essentially equal but unspecified terms.

Why AT&T accepted this settlement rather than continuing to contest the monopolization charges, insisting as it had for decades that its integration offered major efficiencies, remains somewhat of a mystery. Its management undoubtedly feared that a litigated judgment against it, which Judge Greene's preliminary decision foreshadowed, would lead to crippling treble damages suits. It almost surely overestimated the chances that Western Electric with Bell Laboratories could achieve major success in computers. And it may have been blinded by the tight-money policy pursued by the Federal Reserve Board at the time. With high-grade bond interest rates of 14 percent, the cost of new capital to AT&T was higher than the rates of return on capital allowed by local regulatory authorities for Bell operating companies, which were under pressure to continue investing vigorously. Thus, every million dollars invested by Bell cost more in interest than it yielded in additional regulated returns, making the Bell operating companies a "dog" in the eyes of stock market investors.[59] This anomaly faded by the late 1980s, but by then, the divestiture was history.

The divestiture itself proved to be more complex than originally contemplated.[60] It was accompanied and followed by tumultuous technological and economic changes: the rapid growth of cellular telephony, which created competition to local Bell operating companies; an explosion of optical fiber cable installations by Bell companies, long-distance telephone rivals, and cable television providers; the

56 U.S. v. American Telephone and Telegraph Co., 524 F. Supp. 1336, 1359, 1345 (September 1981).

57 See Gerald W. Brock, Telecommunication Policy for the Information Age (Harvard University Press, 1994), pp. 157-167.

58 Brock, supra note 57, at 157-159.

59 For a proof, see F. M. Scherer, Industrial Market Structure and Economic Performance (first ed.; Chicago: Rand McNally, 1970), p. 526.

60 See Brock, supra note 57, pp. 167-172 ff.

emergence and growth of the Internet; and, in the first years of the 21st Century, the appearance of new competition to traditional long-distance voice telephony from voice-over-Internet-protocol service offered by cable TV firms. Rules governing the pricing of access to local telephone company networks were revised repeatedly. Three of the seven divested regional Bell operating companies were acquired by the others, leaving only four. In 1996, AT&T chose to abandon the crown jewel it had defended from antitrust for four decades: it spun off its Western Electric manufacturing subsidiary, renamed Lucent Technologies, along with Bell Telephone Laboratories, because their affiliation with Bell was a disadvantage in selling to non-Bell telecommunication companies. By that time, deprived of annual taxes levied on the Bell operating companies, Bell Laboratories retained only a shadow of its former glory. And in 2005, the original AT&T parent agreed to be acquired by SBC, the merged successor from one of its original regional operating companies.

A crucial question is whether the Bell system divestitures accelerated or retarded the technological changes that were occurring. Since the changes were rapid and revolutionary, it would be hard to infer substantial support for the proposition that they retarded progress. Reorganization surely made the divested Bell operating companies more amenable to purchasing from vendors other than Western Electric, and the resulting competition probably accelerated innovation in at least optical fiber cables and digital central office switches.[61] However, most of the communications technology advances following 1982 were facilitated more by FCC actions opening up the telephone network to "foreign devices" such as computer modems and facsimile machines and allowing providers such as MCI, Sprint, and Datran to build and interconnect their own inter-city cable networks than by the divestiture per se. An analysis by the author of labor productivity growth in the telephone communications industry revealed an average growth rate of 6.08 percent per year between 1952 and 1982, before the divestiture, and 5.59 percent between 1985 and 2000.[62] The series is quite noisy, and the mean differences are not statistically significant. Since productivity growth tends to be underestimated by the Bureau of Labor Statistics when there is a high rate of product innovation, as there was in the 1990s, the most plausible inference is that divestiture did no perceptible harm.

5. Cellophane

Tough precedents articulated by the federal courts in the Alcoa (1945), American Tobacco (1946), A&P (1946-49), motion picture exhibition chain (1944-48), and United Shoe Machinery (1953-54) cases suggested that charges of illegal monopolization could be more readily sustained than they were during the 1920s and 1930s. With the possible exception of United Shoe Machinery, however, technological innovation was not a prominent consideration in those cases.[63]

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61 See F. M. Scherer, International High-Technology Competition (Harvard University Press: 1992), pp. 86-97, for case studies.

62 The raw data are found at www.ftp://ftp.bls.gov/pub/special.requests/opt/dipts/oaeh3drt.txt and /oaehhirt.txt. The only year in the series with negative productivity growth, -0.2 percent, was 1984, the year of maximum reorganizational turmoil. The analysis was presented at a University of Colorado Law School seminar in October 2003.

63 Judge Wyzanski's United Shoe Machinery decision in 1953 rejected divestiture of United's single main machine manufacturing plant into three components, but cautioned that the issue might be revisited (as it was in 1968) if more competition in shoe machinery supply did not emerge. An interview with a USM executive by the author in 1958 revealed that, with future divestiture threats hanging over its head, USM was redirecting its research toward diversification opportunities. USM's shoe machinery position declined in subsequent years and the company itself disappeared, initially by merger and then by closure of the

The Cellophane case was therefore a post World War II test of how the federal antitrust authorities and courts would deal with a technologically progressive monopolist. One might view cellophane now as ancient technology, but when it was introduced to the United States by du Pont in the mid-1920s, it was considered high-technology, as suggested by the lyrics of a 1934 Cole Porter song, "You're the Top:"[64]

> You're the top, you're Mahatma Gandhi,
> You're the top, you're Napoleon brandy.
> . . .
> You're cellophane!

Cellophane was invented in France. In 1923, the E. I. du Pont de Nemours Company entered into a joint venture with the French cellophane producer, La Cellophane, receiving through it exclusive North American patent rights and, more importantly, extensive trade secrets required for successful production. Both companies had roots in rayon production, using similar chemical antecedents. Du Pont later gained full ownership of the U.S. operation. Beginning in the late 1920s it developed and patented coating processes through which cellophane could be made moistureproof and also production process improvements that reduced costs, improved product quality, and made the product easier to use by packagers. In 1930 Sylvania, a Belgium-based company (unrelated to the light bulb producer of identical name), began producing and selling cellophane in the United States. A patent infringement suit by du Pont led to a settlement under which du Pont licensed Sylvania to its patents at a 2 percent royalty rate which, however, increased to at least 30 percent if Sylvania's output exceeded quotas stipulated by du Pont. It was alleged that du Pont, la Cellophane, and other cellophane producers reached spheres of influence agreements under which non-U.S. firms were prevented from selling in the U.S. market, but du Pont executives denied under oath that they had actually participated in those agreements. Du Pont did lobby for and obtained in 1929 U.S. import tariffs of 60 percent (later, 45 percent) that kept virtually all cellophane imports out of the United States. During the 1930s and 1940s, therefore, du Pont, with a share of approximately 75 percent, and Sylvania, with 25 percent, were the only significant suppliers of cellophane in the United States. Except for the early infringement suit against Sylvania and one other minor incident, there was no evidence of du Pont actions like those of General Electric or Standard Oil seeking to prevent entry through extensive patent litigation, predatory pricing, or acquisition of competitors.

In 1947 the Department of Justice charged du Pont with monopolization. A decision in 1953 by Judge Paul Leahy of the U.S. District Court for Delaware began with a review of economic theories and then laid down extensive findings of fact and law.[65] The court's emphasis was on the question of whether the relevant market was cellophane, dominated by du Pont, or flexible packaging materials, in which du Pont's share was less than 20 percent -- too small for a monopolization finding. However, Judge Leahy also ruled that the evidence did not support a finding that du Pont had exhibited more intent to monopolize and exclude competitors than what one would reasonably expect of a company striving for success in its commercial efforts. Rather, Judge Leahy concluded:[66]

> [Du Pont's] "monopoly" was "thrust upon" it within the true meaning of the [precedential] decisions... and the facts as to how du Pont achieved its position.... [D]u Pont's position is the result of research, business skill and competitive activity. Much of du Pont's evidence was designed to show research, price and sales policies of that Company are responsible for its success and these policies

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Beverly, Massachusetts, plant. The best shoe machinery is now imported preponderantly from Italy. A careful case study would be desirable.

64 From the musical, "Anything Goes."

65 U.S. v. E. I. du Pont de Nemours & Co., 118 F. Supp. 41 (1953).

66 Ibid. at 217, 233.

> were conceived and carried forward in a coordinated fashion with skill, gaining for du Pont substantial recognition in the packaging industry.... The record reflects not the dead hand of monopoly but rapidly declining prices, expanding production, intense competition stimulated by creative research, the development of new products and uses and other benefits of a free economy.

On the question of market definition, which was the only part of the district court's decision appealed to and broadly sustained by the Supreme Court,[67] Judge Leahy observed that cellophane competed with a broad range of flexible packaging materials, including lower-cost materials such as waxed paper and bleached glassine as well as higher-cost polyethylene, pliofilm, and Saran wrap. Du Pont, he said, competed vigorously, among other things reducing its costs and its average price per pound from $1.06 in 1929 to 38 cents in 1940, to have its cellophane substituted for alternative packaging materials. He continued:[68]

> Du Pont has no power to set cellophane prices arbitrarily. If prices for cellophane increase in relation to prices of other flexible packaging materials it will lose business to manufacturers of such materials in varying amounts for each of du Pont cellophane's major end uses. Relative increases would make competition more difficult to obtain new business.

Judge Leahy's view of the constraints facing du Pont in its cellophane pricing decisions is characterized by some economists as "the cellophane fallacy."[69] The essence of the fallacy is that firms with some degree of product differentiation, and hence some discretion as to what price to charge, will maximize their profits by raising their prices near to, but not all the way up to, the level at which they lose substantial sales as a result of cross-elasticity of demand imparted by the competition from substitute products. In other words, they raise their prices into a range of substantially elastic demand. This concept is illustrated, crudely but with an attempt to track the cellophane facts of the late 1940s, in Figure 2. Du Pont's demand function, given the prices of potential substitute products, is the wavy solid line, giving rise to a wildly fluctuating and discontinuous dash-dash marginal revenue function.[70] The intuition is as follows. At a price of 5 cents per 1,000 square inches, cellophane is (a bit unrealistically) so high-priced relative to substitutes that no sales occur. As the price is reduced, cellophane gains sales volume from high-priced substitutes such as pliofilm and Saran wrap. As the price is reduced further into a range slightly above 2 cents, it captures most of the volume those substitutes otherwise would have enjoyed. But around point B it has largely exhausted the opportunities for capturing such high-quality applications, so demand becomes more inelastic. If however it can bring its price into the one-cent range, it can capture a large volume of applications from low-quality substitutes such as glassine and waxed paper, so demand turns price-elastic again.

Given this curvilinear demand function, which, the author believes, typifies many differentiated product situations,[71] multiple profit-maximizing equilibria exist. One, where the first intersection of marginal cost (dot-dash-dot MC) with marginal revenue occurs, leads to an equilibrium at point A, with a price of roughly 2.6 cents and quantity QA. A second equilibrium occurs at point B, with a price of

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67 U.S. v. E. I. duPont de Nemours and Company, 351 U.S. 377 (1956).

68 118 F. Supp. 41, 179.

69 The term came to me by oral tradition; its origin is unknown, at least to this author. A predecessor without the word "fallacy" was Donald F. Turner, "Antitrust Policy and the Cellophane Case," 70 Harvard Law Review 281 (December 1956), pp. 288, 297, and 308-310.

70 The curves were plotted using two spliced algebraic equations, simplifying the otherwise difficult task of ensuring that the marginal revenue function was drawn correctly.

71 See also F. M. Scherer and David Ross, Industrial Market Structure and Economic Performance (third edition; Boston: Houghton-Mifflin, 1990), pp. 181-183.

approximately 1.95 cents and quantity QB. Of the two, profits -- the summed surplus of revenue above marginal cost -- are higher at equilibrium B, so this is what one would expect du Pont to choose. If it raised its price just a fraction of a penny, it would experience massive volume losses to superior substitutes, as Judge Leahy implied -- hence the cellophane fallacy.

How much monopoly power a producer possesses under these conditions depends upon the varying curvature of the demand functions and the relation of the demand function to the marginal cost function. As Figure 2 is drawn, marginal costs are too high for cellophane profitably to capture volume from waxed paper and glassine. But at equilibrium B, the price is roughly twice marginal cost and substantial profits (ignoring fixed costs) are realized. The implication is that the producer facing the conditions of Figure 2 does have appreciable monopoly power, despite substantial substitution possibilities. In a critique of Judge Leahy's decision, economists George Stocking and Willard Mueller argue that close attention should have been paid to du Pont's 24.2 percent average after-tax profit return on investment in its cellophane operations.[72] Judge Leahy acknowledged du Pont's profitability but accorded it little weight.[73]

Figure 1 presents a snapshot in time. In a more dynamic context, Judge Leahy could nevertheless have been correct on the importance of substitution. DuPont did implement technological improvements and reduce cellophane costs substantially over time. If marginal costs had been two cents or more per 1,000 square inches, e.g., in an earlier phase of the cellophane marketing history, there would be only one equilibrium, northwest of point A at a price of roughly 3.4 cents, allowing most higher-priced substitutes to retain their volume. By reducing costs and hence profit-maximizing prices over time, du Pont captured demand from substitute products. But around the 3.4 cent alternate equilibrium, it enjoys substantial discretion over what price to charge -- the essence of monopoly power -- and, again ignoring fixed costs, retains appreciable profits. Cost and price reductions by substitute products could also shift the cellophane demand curve and alter quantities. An analysis more subtle than Judge Leahy's -- one, to be sure, that would overwhelm the econometric competence of du Pont's and the government's economists at the time -- would be needed to resolve the matter correctly.

Over the long run, rival packaging materials' prices could also change, shifting cellophane's demand curve -- to the left, if technological progress were more rapid in alternative materials than in cellophane. That something like this must have happened is suggested by Census data showing an absolute decline in cellophane sales between 1954 and 1977. Also, in 1954, cellophane sales exceeded the sales of unsupported vinyl and polyethylene film by 14 percent; by 1977, sales of a wider array of plastic film and sheeting exceeded those of cellophane by 14 times.[74]

6. Xerox

Scholars and others who spend their lives working with text appreciate xerography as one of the greatest inventions of the 20th Century. The basic concepts were conceived through independent experiments by physicist Chester Carlson between 1934 and 1938. Several basic patents resulted. Realizing that developing a practical xerographic copying machine was beyond his means, and finding none of the

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72 George W. Stocking and Willard F. Mueller, "The Cellophane Case and the New Competition," American Economic Review, vol. 45 (March 1955), pp. 29-63. See especially Table 3.

73 118 F. Supp. 41, 179. See also Judge Learned Hand's caveat on the use of profit evidence. U.S. v. Aluminum Company of America, 148 F.2d 416, 426-427 (1945).

74 U.S. Bureau of the Census, Census of Manufactures, "Industry Statistics" volumes, 1954 and 1977. In 1954, such materials were classified in S.I.C. 2823, "organic chemicals." By 1977, they had been moved to S.I.C. 3079, "miscellaneous plastics products."

roughly 20 companies he approached willing to pursue his invention, Carlson transferred his patents to the Battelle Memorial Institute, a not-for-profit R&D powerhouse, in exchange for a 40 percent share of profits. Battelle made and patented important improvements on Carlson's concepts, including the use of the photo-conducting element selenium as the image transfer basis. But commercial development required more resources than Battelle could allocate. The Haloid Corporation, with sales of roughly $6 million at the time, was the only business entity willing to take up the challenge. In 1946 Battelle assigned Haloid a non-exclusive license to the xerography patents, amended in 1956 to confer upon Haloid exclusive rights to all existing and improvement xerography patents in exchange for $3.5 million cash and an eventual 1.1 million shares of Haloid stock. Haloid (later renamed the Xerox Corporation) pursued the development and in 1959 introduced to the world the first console plain-paper xerographic copier, the 914. It and subsequent models were enormously successful. Erwin Blackstone has estimated that the approximately $20 million Haloid invested in xerography research and development between 1946 and 1960 yielded an after-tax return of at least 25 percent.[75]

The Xerox Corporation continued to patent improvements on its copying machines, amassing a portfolio of nearly 1,000 patents by the mid-1970s. After winning a priority dispute, it licensed its patents on coated paper xerographic copying to numerous other firms, but defended its exclusive position in lower-incremental-cost plain-paper copying inter alia through infringement suits. With a monopoly on plain-paper copying and 86 percent of total U.S. office copier sales and lease revenue in 1971, Xerox increased its profits through a sophisticated price discrimination strategy.[76] One way of extracting more revenue from high-use customers was to tie the sales of toner (priced at such levels that it was called "black gold" by Xerox insiders) to the use of Xerox copiers. A formal contractual tie was avoided because it would lead to patent misuse and Clayton Act problems, but Xerox sales representatives vigorously urged the use of Xerox toner rather than rival offerings said to be inferior. More importantly, Xerox set prohibitively high sale prices for its machines, inducing virtually all customers to lease rather than purchasing. It offered more economical lease terms to high-volume users than to low-volume customers. Because available substitutes were quite inferior to xerography when only a few copies of an original were to be made, but Xerox machines faced tough competition from multilith and mimeograph machines for high-volume jobs, Xerox machines included a meter that charged much higher per-copy rates on small jobs than on large. Service was bundled with the lease of a Xerox machine, making it difficult for independent service vendors to compete. Plain-paper copier provision outside the United States was allocated to partly-owned Rank Xerox of the United Kingdom and Fuji Xerox of Japan.

In 1973 the Federal Trade Commission, revitalized under new leadership after reports criticizing its performance were published by the American Bar Association and Nader's Raiders, issued a complaint alleging that Xerox had monopolized the copying machine market and a plain-paper copier submarket, thereby violating Section 5 of the Federal Trade Commission Act. The complaint emphasized Xerox's monopoly position, its continuing accumulation of patent barriers to entry, at first through acquisition from Battelle and then through internal development, its lease-only policies, the bundling of service with leases, its extensive pattern of price discrimination, and various other practices. Legally, the patent accumulation charge was a weak reed, because it was unlikely that Battelle could have commercialized xerography, and if not Haloid, then who else? Also, the mere accumulation of patents, however many, through internal research and development had been countenanced under an earlier Supreme Court dictum.[77] Certainly, the Xerox facts presented much less in the way of exclusionary practices than the other monopolization cases

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75 Erwin A. Blackstone, "The Copying Machine Industry: A Case Study," Ph.D. dissertation, University of Michigan, 1968, pp. 238-239.

76 The most comprehensive analysis is Blackstone, supra note 75.

77 Automatic Radio Mfg. Co. v. Hazeltine Research, 339 U.S. 827, 834 (1950).

reviewed here. But by 1973, Xerox had enjoyed monopoly sales for 14 years, and by the time a litigation was concluded, it would have possessed a monopoly position for at least the statutory 17 years. This, one might extrapolate from the failures of antitrust in the electric lamp and telephone industries, ought arguably to be a time for therapeutic intervention.

Xerox chose to negotiate. In mid-1975, a consent agreement was reached and, after Tunney Act procedures, approved by the Federal Trade Commission.[78] The most important provision of the consent decree stipulated that Xerox would grant non-exclusive compulsory licenses to its existing patents, domestic and foreign, and any applied for during the three years following the decree. The first three patents chosen by the applicant for license were to be royalty-free; each additional patent bore a 0.5 percent royalty rate up to a maximum royalty rate of 1.5 percent. Other provisions called for know-how transfer, a ban on multi-model lease price discounts, the publication of toner quality specifications, and a mechanism for resolving disputes over whether a rival toner was unsuitable for use.

One naturally inquires, why did Xerox settle rather than litigating what would be a difficult case for the Federal Trade Commission to win? The answer has been provided by David Kearns, at the time group vice president of Xerox and later its CEO:[79]

> We agreed to forfeit much of our patent protection through licensing arrangements, because McColough [the Xerox chairman] believed that the erosion of our hold on the market would not be that significant. After all, there was our unrivaled sales force to contend with and the two decades of experience building our brand in the marketplace. The patents were simply less important than when Xerox was small and fragile.... We already realized that if we didn't license people new competition would come into the business and infringe our patents anyway. We would sue and they would countersue, claiming antitrust. And the litigation would go on and on. We couldn't conduct a business like that. So once we decided we needed to license people there was no reason not to settle with the FTC.

Subsequent events revealed that both Xerox and the Federal Trade Commission staff had misperceived the competitive situation. Both believed that the principal likely rivals to Xerox would be IBM and Eastman Kodak, both of which had commenced their entry into plain-paper copying. As Kearns recalls:[80]

> [W]e were totally blinded by IBM and Kodak. The two of them could throw an awful light into someone's eyes.... It's wrong, however, to think that we were oblivious to the Japanese. My very first summer at Xerox, I remember going to meetings where the Japanese came up for discussion. People would say, "The Japanese are coming. The Japanese are coming." So it wasn't a matter of Xerox not knowing about Japan. In fact, we predicted the Japanese would arrive sooner than they did. But what no one at Xerox seemed to have any good grasp of was the level of quality and the low cost of manufacturing that the Japanese were destined to achieve.

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78 As director of the FTC's Bureau of Economics, the author co-signed the recommendation that the Commission accept a consent settlement.

79 David T. Kearns and David A. Nadler, Prophets in the Dark: How Xerox Reinvented Itself and Beat Back the Japanese (New York: Harper Business, 1991), pp. 64-65. On the importance of innovators' non-patent advantages, see Richard C. Levin et al., "Appropriating the Returns from Industrial Research and Development," Brookings Papers on Economic Activity (1987, no. 3), pp. 783-820.

80 Supra note 79 at 75.

Within a few years after the consent decree, Japanese firms such as Canon, Toshiba, Sharp, Panasonic, Konica, and Minolta had achieved significant inroads into the U.S. market with copying machines that were more reliable and lower-priced than those of Xerox. Xerox was forced by this new competition into a strenuous program of "re-inventing" itself. By 1977, at a major Xerox sales conference, Xerox CEO Peter McColough delivered:[81]

> ... a blunt appraisal of the marketplace and Xerox's position in it. In no uncertain terms he made it clear that Xerox was being "out-marketed, out-engineered, outwitted in major segments of our market." He underscored the fact that Xerox would never have it the way it did when it was protected by its patents, when it could take its sweet time developing and introducing products and when it made no difference how much it cost to make something because the company could charge almost whatever it wanted.... Peter stressed ... "We are now faced with the urgent need for change within this company!"

In hindsight, it seems clear that by facilitating the availability of well-designed foreign and domestic copiers and stimulating Xerox's efforts to enhance its competitiveness, the Xerox settlement provided major benefits to the copier-using American public.[82]

7. IBM

Building upon concepts developed for military purposes during World War II, Univac I, the first commercial general-purpose digital electronic computer, was introduced by Remington-Rand in 1951.[83] An attempt by its designers to obtain basic patent protection failed. IBM, which with its tabulating card machines dominated the automatic data processing field, saw its position threatened.[84] It developed a series of electronic computers, the first of which, the IBM 702, was introduced in 1953. After retraining and refocusing its large tabulating card sales force, IBM was much more successful than Remington and other rivals in persuading business organizations to embrace the mysteries of digital computing. By 1955, IBM's share of rapidly increasing general-purpose digital computer installations had risen to 75 percent, and from then until the 1980s, it retained a dominant position. As computer users built their data processing operations around IBM software and data formats, they became "locked in" to new and backward-compatible IBM computer versions. Other firms tried to break the lock by designing computers that emulated the IBM architecture, but without great success. Repair service, needed often in the early days of computing, came bundled with lease or purchase contracts, as in Xerox, making it difficult for outside service firms to flourish. From early on, required to do so under a 1956 consent decree, IBM offered either to lease or sell its computers.[85] Most customers were averse to obsolescence risks and therefore preferred

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81 Kearns, supra note 79, at 100. See also pp. 68 and 123.

82 See also Timothy F. Bresnahan, "Post-Entry Competition in the Plain Paper Copier Market," American Economic Review, vol. 75 (May 1985), pp. 15-19, and the longer study on which it is based pp. 18-24. A crucial "fast-second" error by IBM occurred after its antitrust contest with the government was concluded. To avoid cannibalizing mainframe computer sales, it delayed using Intel's new 32-bit 80386 microprocessor in its personal computers until 1987, seven months after Compaq did so. It rapidly lost leadership in PCs.

83 Excellent early histories are Joel Shurkin, Engines of the Mind (New York: Norton, 1984); and Kenneth Flamm, Creating the Computer (Brookings: 1988). This section is adapted from F. M. Scherer, Industry Structure, Strategy, and Public Policy (New York: HarperCollins, 1996), Chapter 7.

84 IBM's tabulating card monopoly was the subject of a consent decree that among other things required compulsory licensing of IBM's computer patents. U.S. v. International Business Machines, Inc., CCH 1956 Trade Cases, para. 68,245.

85 Xerox's leasing and pricing strategies were said to have been modelled on those of IBM.

leases. This aggravated a classic dominant firm problem for IBM.[86] Bringing out a more powerful machine led customers to cancel their leases, cannibalizing IBM's existing revenues, to install the newer machine. IBM therefore tended to pursue a "fast second" strategy, delaying the introduction of new machines until inroads from rival machines became a serious threat.[87]

As fringe rivals redoubled their innovative efforts with transistorized models during the early 1960s, IBM was induced to escalate the fast second strategy on its ambitious System 360 development. To avert customers' defection to more advanced rival machines, it not only accelerated the development, but announced the complete 360 line before development had proceeded far enough to ensure that quality goals and delivery dates could be met. Particularly serious slippage occurred on its time-sharing machines and the high-end System 360/90 targeted at Control Data Corporation's superior scientific data processing computer and expected from the outset to incur substantial out-of-pocket losses. A successful Sherman Act suit by CDC followed. By embodying standardized plug-in interfaces, System 360 also created another problem. Part of IBM's strategy was to price entry-level computers low but sustain high margins on peripherals such as add-on memory, tape drives, and disk drives. Since inexperienced customers almost always underestimated their need for peripherals, the sale of a computer at a low price informally "tied" customers to the purchase of high-margin peripherals. With System 360's standardized interfaces, plug-compatible peripheral manufacturers (PCMs) proliferated. To combat them IBM pursued an array of strategies, including the sale of "fighting machines" at arguably predatory prices, lease plans with discounts tailored to lock customers in until rival peripherals were unprofitable; moving control functions into the central processing unit, where they could be altered to render rival peripherals inoperative; delaying the release of interface information to the disadvantage of competitive peripheral developers; and changing the traditional sales price vs. lease price ratio to undermine the profitability of firms that leased rival peripherals to IBM computer users. More private antitrust suits followed, most of which IBM eventually won, in part because contemporary decision-making memoranda had been screened by internal counsel to ensure that they contained no "smoking gun" language.

On January 17, 1969, the last day of the Johnson Admin-istration, the Department of Justice filed a broad Sherman Act complaint against IBM, alleging monopolization and citing most of the practices outlined above.[88] After extensive discovery, the trial in Southern District of New York federal court began in 1975 and continued into 1981.[89] IBM fiercely contested the government's allegations -- on defining the market as "general-purpose digital computers;" on how much pricing discretion it enjoyed; on the relevance of IBM's high accounting profits as an indicator of monopoly; on whether IBM's pricing was predatory and on alternative tests for predation;[90] on IBM's "fast second" innovation strategy, renamed "leapfrogging;" on whether there was such a thing as software "lock-in;" on customers' preferences for leases and bundled service; and on many other facets of IBM's practices.[91] The presiding judge was

86 See Gerald O. Brock, The U.S. Computer Industry (Cambridge: Ballinger, 1975), Chapter 7.

87 On the original and more general theory, see W. L. Baldwin and G. L. Childs, "The Fast Second and Rivalry in Research and Development," Southern Economic Journal, vol. 36 (July 1969),

88 The case had been vetted by President Johnson's Council of Economic Advisers and was vetted again by Richard Nixon's Council. The PCM practices were added in a later amendment.

89 The author was initial economist witness of several appearing for the government.

90 See Phillip Areeda and Donald F. Turner, "Predatory Pricing and Related Practices under Section 2 of the Sherman Act," Harvard Law Review, vol. 88 (February 1975), pp. 697-733, which was apparently written as a result of consulting for IBM, and which precipitated a string of articles presenting alternative theories.

91 For the best summary of IBM's economic case, see Franklin Fisher et al., Folded, Spindled, and Mutilated: Economic Analysis and U.S. v. IBM (MIT Press: 1983). The best statement of the government's case is Richard T. DeLamarter, Big Blue: IBM's Use and Abuse of Power (New York: Dodd, Mead, 1986).

unwilling or unable to bring the parties to focus issues and expedite the trial. The government's team was led by senior Department of Justice attorneys with much trial experience, but a limited understanding of economics and high-technology issues, who ceded much of the trial's strategic direction to staff economists.

As the trial neared completion, the Reagan Administration took office. A new Assistant Attorney General, William Baxter, began a thorough review of the case's merits (along with the parallel AT&T case). On January 8, 1982, he announced simultaneously the consent settlement reached in AT&T along with his decision to abandon the IBM case -- thirteen years after its initiation. In Baxter's asserted view, "continuing the case would be an expensive and ultimately futile endeavor,"[92] in part because events since the case commenced had significantly transformed computer industry structure. In particular, IBM had reacted too slowly to retain leadership in top-end scientific computer placements, it had been thoroughly defeated at the lower end by mini-computer makers such as Digital Equipment, Data General, Tandem, and Prime; and the personal computer revolution was underway.

An appropriate epitaph is found in the memoirs of IBM's chairman, Thomas J. Watson Jr.:[93]

> Looking back, I see a lot of sad irony in the whole affair. I think a lot of people would agree that at the outset the Justice Department's complaint had merit. IBM was clearly in a commanding position in the market, and some of our tactics had been harsh. We eliminated many of these practices ourselves, and our overall record during the case was pretty clean... [T]he case stretched on unresolved for so long that before it was over history showed my argument ... to have been right. IBM kept growing, but the computer industry grew even more, and the natural forces of technological change etched away whatever monopoly power we may have had.

Despite dissuasion by the U.S. government, the European Commission persisted in a parallel antitrust complaint against IBM. In August 1984 a settlement was negotiated under which IBM agreed to "unbundle" all add-on memory but the minimum amount needed for machine operation and to provide in advance the interface information needed for peripheral manufacturers to attach their products to IBM computers.[94]

8. Microsoft

IBM was slow in recognizing the possibilities of personal computers, lagging even more than one might expect under a "fast second" theory.[95] In its crash catch-up development program to introduce the first IBM PC on August 12, 1981, IBM departed from its usual practice of developing its own operating system and instead chose one it believed (somewhat erroneously) to be already available. It licensed MS/DOS from a fledgling Seattle software house, Microsoft, which obtained it from another firm, Seattle Computer Products. Microsoft secured from SCP non-exclusive rights for $50,000 and later exclusive rights for $925,000. IBM's imprimatur convinced business enterprises that personal computers were more than a children's plaything, and sales soared. Since IBM's contract with Microsoft was nonexclusive, a PC

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92 Memorandum of William F. Baxter to the U.S. attorney general, January 6, 1982.

93 Thomas J. Watson Jr. (with Peter Petre), Father, Son & Co.: My Life at IBM (New York: Bantam, 1990), p. 415. See also my review of the DeLamarter book, Antitrust Bulletin, vol. 32 (Fall 1987), 829, 840.

94 On the consequences, see F. M. Scherer, "Microsoft and IBM in Europe," Antitrust & Trade Regulation Report, January 24, 2003, pp. 65-66.

95 For a complementary sociological explanation, see Clayton M. Christensen, The Innovator's Dilemma: When New Technologies Cause Great Firms To Fail (Harvard Business School Press: 1997

"clone" industry emerged using the MS/DOS operating system. The large number of PCs, from IBM and clones, residing on desktops induced applications software houses to assign first priority to writing applications programs -- thousands of them -- running on the MS/DOS platform. Superior availability of applications software in turn stimulated consumers to prefer desktop computers running MS/DOS, giving Microsoft a leading position in the provision of operating systems.

Personal computer pioneer Apple sought to escape this snowball effect by introducing in January 1984 its Macintosh computer, the first economically-priced desktop computer to offer a graphical user interface (GUI) (conceived but not successfully commercialized by the Xerox Corporation's Palo Alto Research Center). Commissioned by Apple in 1982 to write applications programs for the Macintosh, Microsoft learned the Macintosh operating system's structure and devised its own GUI operating system, Windows, pre-announced in November 1983 but not available to consumers until two years later. A suit by Apple alleging that Windows infringed the Macintosh copyright's "look and feel" was unsuccessful. So also were the early under-powered versions of Windows, but Windows 3.0, rolled out in May 1990, became a spectacular market success. One reason for the success of Windows 3.0 was that it resided on an MS/DOS platform and could therefore run applications programs written for either MS/DOS or Windows. Software houses offering the leading PC application programs at the time were focusing their GUI efforts on IBM's OS/2 operating system, which both IBM and Microsoft predicted would be the PC operating system of the future. But Microsoft was ready with its Excel spreadsheet and WORD word-processing programs optimized for Windows 3.0, and it soon captured a dominant position in office applications programs to complement its 85 to 90 percent share of desktop computer operating systems placements. By choosing not to "port" Excel and WORD to operating systems other than Windows and Macintosh, Microsoft enhanced what came to be called an "applications barrier to entry" congealing the preferences of users trained on and loyal to Excel and WORD.

Microsoft's dominance was investigated in the early 1990s by the Federal Trade Commission, which reached no decision to act, and then by the Department of Justice, which filed a complaint in July 1994. The complaint addressed an array of Microsoft practices, including premature product pre-announcement to combat rival products and unfair advantages allegedly possessed by Microsoft applications program writers through earlier and more complete knowledge of operating system interface parameters. But the negotiated consent decree filed on the same day as the complaint remedied mainly Microsoft's practice of charging computer assemblers a royalty for every PC they sold, whether it contained a Microsoft operating system or one offered by competitors. To install a rival's Windows clone, therefore, the PC producer paid twice, which was unattractive, solidifying Microsoft's dominance. The consent decree banned this practice. Reviewing the proposed decree under the Tunney Act, District Judge Stanley Sporkin rejected it, stating that it was insufficient to correct other named abuses.[96] Microsoft appealed. The Appellate Court found that Judge Sporkin had exceeded his authority and remanded the case to a new judge with instructions to enter the decree.[97]

The mid-1990s brought a new threat to Microsoft's dominance. The Internet evolved from a Department of Defense computer-linking system in the 1970s through the National Science Foundation's NSFnet to an open system in 1995. The extensive installation of optical fiber cables made it possible to transmit computer data inexpensively, and the relaxation of AT&T's "foreign attachments" restrictions permitted easy coupling of computers with telephone - cable networks. In November 1994 Netscape introduced a full-scale test version of its Navigator browser, which made it possible for computer users to access materials stored on servers throughout the world. It achieved extraordinarily rapid growth in 1995. Microsoft officials saw in Navigator a threat to the dominant position of Windows. Software writers might

96 U.S. v. Microsoft Corporation, Civil Action 94-1564, Memorandum Opinion, February 14, 1995.

97 U.S. v. Microsoft Corporation, 56 F. 3rd 1448 (District of Columbia Circuit, 1995).

write applications programs not to Windows, but target them to Internet servers, optimized for applications program interfaces (APIs) exposed by a "middleware" browser such as Navigator, and allowing computer users to combine a browser with a stripped-down operating system to bypass Windows. Meeting with Netscape officials in June 1995, Microsoft officials allegedly offered Netscape 20 percent equity financing in exchange for Netscape's limiting its browsers to older Windows operating systems and leaving the nascent market for significantly improved Windows 95 to Microsoft. Netscape refused. Microsoft thereupon denied Netscape Windows 95 API information until two months after Windows 95 was on the market, putting Navigator software writers at a disadvantage. In December 1994 Microsoft had licensed an alternative browser, Spyglass, from a small firm. It revised the Spyglass instructions to create Internet Explorer, which in late 1995 it began including on a separate diskette free with every copy of Windows 95, forcing Netscape to follow suit and offer Navigator free to all customers. Microsoft also brought pressure to bear upon computer assemblers, threatening them with Windows license cancellation, forfeiture of discounts, or other retaliatory measures if they favored Navigator over Internet Explorer.

At about the same time Sun Microsystems devised a new programming language, Java, for Internet applications. Sun's announced intention was to make Java a universal language with a compiler that would run applications written for it on any computer operating system, with or without Microsoft operating systems. Microsoft officials saw Java as another threat that would divert applications program writers from writing first for Windows. In March 1996 Microsoft contracted with Sun to include unmodified Java compilers with Windows. But to prevent Java from becoming a universally available standard, it changed the Windows Java installations so that applications written for them would not run on the standard Java system.

In the fall of 1997 Microsoft took another decisive step. It announced that Windows 98, to be marketed beginning in mid-1998, would have its Internet Explorer browser physically bundled with the operating system, so new PC buyers could not avoid installing Explorer with Windows 98. When this happened in 1998, it accelerated the increase in Explorer's usage share relative to Navigator. The announcement prompted the Justice Department to sue, alleging that physical bundling of Internet Explorer violated the 1995 consent decree. District Judge Thomas Penfield Jackson issued a preliminary injunction requiring that Microsoft provide a version of Windows 98 from which Explorer was unbundled. But Microsoft had bargained hard to have language in the 1995 consent decree stating that Microsoft was not prohibited from "developing integrated products," deleting from a government draft four trailing words, "which offer technological advantages."[98] This permissive language was stressed in the Appellate Court's reversal.[99] The Court reserved judgment on whether the bundling independently violated the Sherman Act.

Stung by this defeat, the Department of Justice filed a more sweeping complaint accusing Microsoft of violating Sherman Act Sections I and II, citing the practices articulated in the previous three paragraphs and others. Judge Jackson scheduled a "fast track" trial, among other things limiting each party to 12 trial witnesses plus two rebuttal witnesses. The trial began in October 1998 and lasted 76 days. The government took the unusual step of having as its lead counsel a prominent private-sector antitrust attorney, David Boies, who had been second-in-command on IBM's defense team in the 1970's litigation. Another curious feature of the government's otherwise vigorous prosecution was the failure to present testimony on Microsoft's profits, which, a private study had shown, translated to an extraordinary 88 percent return on

98. See John Heilemann, "The Truth the Whole Truth and Nothing But the Truth," Wired, November 2000, p. 275, which provides a fascinating chronicle of the later Microsoft case's procedural history.

99 U.S. v. Microsoft Corp., 147 F. 3d 935 (D.C. Circuit 1998).

invested capital for 1998 when one did the accounting properly.[100] The government's case was strengthened by a plethora of e-mail messages among Microsoft executives explaining how and why the company was taking strategic actions against various rivals and uncooperative business partners -- discovered, apparently, because the company's leaders had chosen not to implement the thoroughgoing antitrust compliance programs maintained by most U.S. companies with a dominant market position.

On November 5, 1999, Judge Jackson issued lengthy findings of fact indicating that Microsoft's market position and its practices constituted probable Sherman Act violations.[101] He found inter alia that the bundling of Internet Explorer with Windows 98 had improved the quality of Web browsing software, reducing its cost, and increasing its availability, "thereby benefitting consumers."[102] However, to the detriment of consumers, Judge Jackson added, the bundling forced computer assemblers to ignore consumer demand for a browserless version of Windows, increased confusion, degraded system performance, and restricted memory.[103] He concluded with an admonition:[104]

> Most harmful of all is the message that Microsoft's actions have conveyed to every enterprise with the potential to innovate in the computer industry. Through its conduct toward Netscape, IBM, Compaq, Intel, and others, Microsoft has demonstrated that it will use its prodigious market power and immense profits to harm any firm that insists on pursuing initiatives that could intensify competition against one of Microsoft's core products. Microsoft's past success in hurting such companies and stifling innovation deters investment in technologies and businesses that exhibit the potential to threaten Microsoft. The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest.

Judge Jackson thereupon engaged Appellate Judge Richard Posner to mediate between the government and Microsoft with the objective of finding mutually acceptable remedies. Four months of mediation yielded no positive result. On April 3, 2000, Judge Jackson issued conclusions of law, finding that Microsoft had violated Sherman Act Section I through its tying of Internet Explorer to Windows 98 and Sherman Act Section II through monopolization and attempted monopolization. He asked plaintiffs to file a brief on remedies and consolidated actions brought by 19 state attorneys general with the federal government case. The plaintiffs then proposed that Microsoft be divided into two separate companies, one with responsibility for applications and one for operating systems. They requested diverse prohibitions against bundling "middleware" products within the Windows operating system unless an otherwise identical unbundled version was offered, against contractual ties, and against exclusive dealing arrangements. In addition, Microsoft would be required to provide information to third-party software developers needed to ensure that their software interoperates effectively with the Windows operating system. On June 7, 2000, the Court ordered that the plaintiffs' proposed remedies be implemented without significant changes.[105]

Needless to say, Microsoft appealed. And from that point on, the tide turned against the plaintiffs. The Supreme Court denied certiorari and remanded the appeal to the District of Columbia Court of Appeals for

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100 Remedies Brief of Amici Curiae Robert E. Litan et al., April 27, 2000, Appendix p. 2. The probable reason was that the government's lead economic expert, Franklin Fisher, had testified in U.S. v. IBM that profitability data were meaningless.

101 U.S. v. Microsoft Corp., 84 F. Supp. 2d 9 (1999).

102 Ibid., para. 408.

103 Ibid. para. 410.

104 Ibid., para. 412.

105 U.S. et al. v. Microsoft Corp., 97 F. Supp. 2d 59 (2000).

en banc hearing. The Clinton Administration left office, and a new team was appointed by President George W. Bush. The Bush team chose to have the appeal argued by Solicitor General staff with no prior connection to the case and minimal understanding of its facts and economic principles.[106] In its decision, the Appellate Court sustained the lower court's finding that Microsoft had monopolized the personal computer operating system market through its dominant position and its conduct.[107] It vacated, however, Judge Jackson's conclusion that Microsoft had attempted to monopolize a browser market, ruling that the market had been insufficiently defined. It remanded for further analysis on a rule of reason basis Judge Jackson's decision that Microsoft's bundling of Internet Explorer with Windows was a per se violation of Sherman Act Section II, observing that:[108]

> Microsoft does not dispute that many consumers demand alternative browsers. But on industry custom Microsoft contends that no other firm requires non-removal because no other firm has invested the resources to integrate web browsers as deeply into its OS as Microsoft has.... Microsoft contends not only that its integration of IE into Windows is innovative and beneficial but also that it requires non-removal of IE.... Microsoft argues that IE and Windows are an integrated physical product and that the bundling of IE APIs with Windows makes the latter a better applications platform for third-party software. It is unclear how the benefits from IE API's could be achieved by quality standards for different browser manufacturers. We do not pass judgment on Microsoft's claims regarding the benefits from integration of its APIs. We merely note that these and other novel, purported efficiencies suggest that judicial "experience" provides little basis for believing that, "because of their pernicious effect on competition and lack of any redeeming virtue," a software firm's decisions to sell multiple functionalities as a package should be "conclusively presumed to be unreasonable and therefore illegal without elaborate inquiry as to the precise harm they have caused or the business excuse for their use."

Because it chose not to sustain two of the three broad violation findings, which might arguably render the divestiture remedy excessive, and also because it believed Judge Jackson had erred by not holding hearings on the efficacy of the proposed remedies, the Appellate Court vacated the remedial order and remanded the matter to a lower court for reconsideration. And because, it said, Judge Jackson had violated judicial canons by talking to representatives of the press before the proceedings had ended and made to them disparaging remarks about Microsoft's good faith, the Appellate Court disqualified Judge Jackson from further participation in the case. A new district Judge, Coleen Kollar-Kotelly, was appointed to preside over the remaining proceedings.

In renewed negotiations, Microsoft and the Department of Justice agreed upon a settlement without divestiture or mandatory unbundling provisions. The settlement was widely criticized in the press as mild and insufficient.[109] Ten state attorneys general dissented and elected to pursue their own remedy

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106 "Upfront: Trustbusters: Did Microsoft Catch a Break?" Business Week, March 12, 2001, p. 14. The author listened to the proceedings on public radio and reached the same conclusion.

107 U.S. v. Microsoft Corp., 253 F. 3d 34 (June 2001).

108 Ibid., at 88, 90.

109 See e.g. "It's Still a Safe World for Microsoft," New York Times, November 9, 2001, p. 27; "An Unsettling Settlement," The Economist, November 10, 2001, pp. 57-58; "Settlement or Sellout?, Business Week, Nov. 19, 2001, pp. 112-116; "Slapping Microsoft's Wrist" (editorial), Business Week, November 19, 2001, p. 152; and "Skepticism in Senate Panel Over Accord with Microsoft," New York Times, December 13, 2001, p. D1. See also the Reuters news dispatch of February 9, 2005, in which Judge Kollar-Kotelly is quoted as saying that her job was not to ensure that new competition is stimulated, but only to make sure that Microsoft abides by the agreements reached.

proceedings -- ultimately, with little effect. The government chose not to follow through on the appellate court's invitation to retry the bundling issue on a rule of reason basis. After complex hearings, a final judgment with remedial order was issued by Judge Kollar-Kotelly in November 2002 -- five years after the initial complaint against Microsoft's bundling announcement.[110] It required non-discriminatory licensing of the Windows operating system at publicized terms, barred restrictive agreements limiting computer assemblers' freedom to feature middleware competitive with Microsoft's and retaliation by Microsoft against firms that installed rival software, and required disclosure of interface specifications and communications protocols used by Microsoft middleware software to interoperate with the Windows operating system, along with other procedural measures.

Throughout the litigation extending from 1997, Microsoft argued that limitations on its ability physically to integrate (i.e., bundle) software features with its operating system would be an unjustifiable constraint on its ability -- indeed, its right -- to innovate. The claim must be received with a grain of salt, because in Microsoft's history since the early 1980s, licensing or cloning other firms' software innovations, to be sure with Microsoft's own improvements, vastly predominated over coming up with successful, really new software features. And equally clearly, strategic objectives -- disadvantaging rival vendors -- played a major or even decisive role in its bundling decisions.

Despite being put on notice in 1997 that it risked antitrust prosecution through strategic bundling, Microsoft in May 1999 physically integrated its Windows Media Player, which up to that time had been supplied as a separate product, into its Windows operating systems. This bundling action became one key focus, along with Microsoft's promotional claims that Microsoft server software interoperated more smoothly than rival server software with ubiquitous Microsoft desktop operating systems because of secret communications protocols and Microsoft's superior knowledge of APIs, of a major European Commission competition policy complaint and adverse decision.[111] In April 2004 the Commission ordered Microsoft to market Windows versions with Windows Media Player unbundled and to undertake much more extensive disclosure of applications interface specifications and communications protocols than had been required by the United States courts. Microsoft attempted to stay implementation of the remedies until appeals had been exhausted (which could consume several years), but its petition to stay to the European Court of First Instance was denied in December 2004.[112]

9. Conclusion

Reviewing the history of seven great monopolization cases, one is forced to a mixed verdict on whether the antitrust authorities are able competently to deal with structural monopoly and related sustaining practices in high-technology industries. In a majority of the cases, it took far too long, and in some instances several attempts, to come to grips with the problems. By the time the courts were ready for judgment, technological and economic changes had radically altered the environment in which the remedies originally sought would apply. This holds true also for the unusually expeditious Microsoft litigation, which, at least in the United States, achieved little or nothing in the end. The most rapid solutions were achieved through negotiated consent decrees, which require a belief on the part of respondents that they will not be seriously disadvantaged. In Xerox and AT&T (1982), the corporate

110 State of New York et al. v. Microsoft Corporation, 224 F. Supp. 2d 76, 266 (November 2002).

111 Commission of the European Communities, Commission Decision, Case COMP/C-3/37.792 (Microsoft), April 21, 2004.

112 Order of the President of the Court of First Instance, Case T-201-04R, 22 December 2004, found at http://curia.eu.int/cgi-bin/gettext.pl?lang=en&num=7995877. The author appeared as a witness on behalf of Real Networks in the hearing and consulted previously for Sun Microsystems in its litigation against Microsoft.

settlers were probably too optimistic -- the decrees did open up avenues for substantially enhanced technological competition. In early cases, the courts shunned balancing technological gains, measured in terms of actual performance or theoretical arguments for patent accumulation, against strategies that suppressed competition. In later cases the courts' balancing record is more mixed. In Microsoft, Judge Jackson struggled admirably to weigh the benefits of browser integration against competitive harm, but his efforts were insufficient to convince a skeptical Court of Appeals fearful of impeding technological progress and reluctant to undertake the job on its own.

The courts' adjudication of complex technological tradeoff questions would be facilitated if the presiding judge were able to retain as a clerk an expert with the requisite specialized knowledge. Judge Jackson attempted to do so in Microsoft, but was blocked in 1998 when Microsoft objected to his choice. Securing unbiased expertise is undoubtedly difficult, but its solution must lie within the bounds of judicial ingenuity.

From the great cases reviewed here, it would appear that dominant firms have accumulated far more monopoly power than is necessary to motivate and sustain the most rapid and beneficial rate of technological progress. All seven of the seminal products that gave rise to monopolization actions were invented or initially developed by entities other than the eventual monopoly or by small firms that only later grew to dominance. In several cases, such as electric lamps, the telephone, and computers, early inventions were made simultaneously but independently by multiple sources of initiative. In many instances, once a single firm came to dominate a new technology, it was palpably resistant to innovation after its position was secured. And in several such cases, the "fast second" phenomenon was evident: dominant firms delayed feasible innovations until their dominance was threatened by an upstart. Quite generally, the underlying economic literature suggests, new competition and the threat of being left behind -- Schumpeter's "creative destruction" -- are the most powerful spurs to innovation for well-established enterprises.[113]

This suggests a reorientation of policy. The benefit of the doubt in high-technology monopolization matters ought to be resolved in favor of keeping structural and behavioral barriers to innovative new entry as low as possible. Even for cases in which monopoly was the natural result of significant innovation rather than other exclusionary practices, it implies skepticism toward monopoly positions that have been sustained through the accumulation of internally-developed patents for longer than the 20 years contemplated in current patent law. The "for limited Times" language in Article I, Section 8, of the U.S. Constitution should be taken seriously in order to promote the progress of science and the useful arts. Since properly conservative courts are unlikely to change the law in this direction without Congressional guidance, appropriate legislation should be enacted to ensure the vibrancy of U.S. industrial technology in a world of increasingly tough technological challenges from abroad.

[113] For wide-ranging historical evidence, see Burton Klein, Dynamic Economics (Harvard University Press, 1977).

THE POLITICAL ECONOMY OF PATENT POLICY REFORM IN THE UNITED STATES

by F.M. Scherer

PRELIMINARY VERSION

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1. Introduction

During the 1980s and 1990s, important legislative, judicial, and diplomatic initiatives emanated from the United States, strengthening patent and copyright enforcement systems both domestically and in the broader world economy. The political influences that led to these changes are interesting in their own right.[1] Even more interesting, however, is the fact that governmental emphasis on patent systems increased in the wake of impressive new findings from economic studies showing that patents played a surprisingly minor role in well-established corporations' decisions to invest in research, development, and technological innovation. The opposing movements of the political and behavioral science currents will be a principal theme of this article.

2. The Turbulent Early History

Governments' policies toward patents on inventions and copyright for artistic works have been marked by appreciable fluctuations over the course of history. At the dawn of the 17th century, patents and copyrights were components of the feudal system in Western Europe.[2] Sovereigns awarded exclusive privileges to pursue a mechanical trade, publish books or music, and present theatrical performances to selected individuals -- usually but not always those with close connections to the noble courts and often favorites of the court. The privilege system was attacked under the banner of the Enlightenment, first during the reign of James I in England (1603-25) and then with the 1789 French Revolution and the eastward spread of anti-feudal policies under Napoleon. It was replaced by patents and copyrights made available to the middle classes through more transparent procedures, but limited in the time span over which they were applicable. In the New World, granting to authors and inventors exclusive rights to their writings and discoveries for limited times was enshrined in Article I, Section 8, of the U.S. Constitution.

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1. For a contribution with a similar focus and some similar conclusions, see William M. Landes and Richard A. Posner, **The Political Economy of Intellectual Property Law** (AIE-Brookings Joint Center for Regulatory Studies: 2004), which in turn is derived from Landes and Posner, **The Economic Structure of Intellectual Property Law** (Harvard University Press: 2003).

2. For authoritative histories, see Fritz Machlup and Edith Tilton Penrose, "The Patent Controversy in the Nineteenth Century," **Journal of Economic History, vol**. 10 (May 1950), pp. 1-29; Machlup, **An Economic Review of the Patent System**, Study No. 15 of the Senate Judiciary Committee Subcommittee on Patents, Trademarks, and Copyrights (1958); and, putting copyright privileges in a more democratic light, Hansjörg Pohlmann, Die Frühgeschichte des musikalischen Urheberrechts (Kassel: Bärenreiter, 1962).

The period between the 1770s and 1840s, when patent and copyright laws spread rapidly, was followed, at least in Europe (but less so in the United States), by an "anti-patent" movement. In England, reforms following publication of Charles Dickens' spoof, "A Poor Man's Tale of a Patent," simplified the processes by which patents were issued, imposed stricter examination of patent applications, and allowed abrogation of exclusive rights in cases of demonstrated abuse. The Swiss legislature repeatedly rejected proposals to enact patent laws, and in the Netherlands, existing patent laws were repealed in 1869, to be reenacted only in 1910. The severe recession of 1873 triggered more favorable attitudes toward patents, and in 1887, even conservative Switzerland found it prudent to pass a patent law.

In the United States the patent system enjoyed widespread and persistent political support, among others, from Abraham Lincoln, who had personally patented an invention of his creation and who as an attorney in Illinois had litigated patent disputes. Inventors such as Thomas A. Edison and Alexander Graham Bell were idolized. Extensions over time of the Bell telephone monopoly and a cartel originally based upon the Edison electric lamp patents were sustained in a series of Supreme Court tests, reinforcing an earlier decision allowing a patent holder unilaterally to stipulate the minimum prices at which its licensees could sell their products and ignoring evidence that the patent-holder had pursued numerous parallel actions that in effect cartelized the relevant industry.[3] During the 1960s the Department of Justice sought to overturn the still-binding precedent, but was unsuccessful.[4]

In most respects, however, the tide turned again during the Great Depression of the 1930s. Growing hostility toward monopoly was precipitated by the belief that downward price rigidities enforced by monopolistic sellers (as well as by cartels authorized under President Franklin D. Roosevelt's National Recovery Administration) inhibited recovery from the depression. Threats to national security posed by patent-based cartels in tungsten carbide machine tools and synthetic rubber raised questions about the abuse of patent grants. So also did the wide-ranging investigations of the Temporary National Economic Committee, which showed inter alia how industries such as glass container-making had been thoroughly regimented through collusive control of patents by the Hartford-Empire Company. At an American Economic Association symposium reviewing the TNEC's findings, later Nobel Laureate George Stigler found the Hartford-Empire story "an eloquent example of an evil demanding correction" and concluded flatly that "The case for limitation of restrictive [patent] licensing is surely irrefutable."[5]

Hartford-Empire was an early target of the reinvigorated antitrust enforcement paralleling the TNEC hearings. Its extensive patent agreements with other bottle-making technology providers and users were found to violate the antitrust laws. To remedy the situation, a federal district court judge ordered inter alia that Hartford-Empire and companies with which it had joined forces be required to license all their bottle-making machinery patents -- after a Supreme Court intervention declaring royalty-free licensing to be confiscatory, at "reasonable" (i.e., modest) royalty rates.[6] After a subsequent Supreme

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3. Bement & Son v. National Harrow Company, 186 U.S. 70 (1902), followed by U.S. v. General Electric Co., 272 U.S. 476 (1926). The rationale was that since holding a valid patent allowed the patent holder to exclude others and hence to monopolize sale of the relevant products, licensing restraints that preserved the patent holder's monopoly reward were acceptable.

4. See e.g. U.S. v. Huck Mfg. Co. et al., 382 U.S. 197 (1965), in which an attempt to overturn earlier Bement and General Electric precedents failed with a 4-4 division of Supreme Court justices.

5. George J. Stigler, "The Extent and Bases of Monopoly," American Economic Review, vol. 32 Supplement (June 1942), p. 14. At the time, Stigler was teaching at the University of Minnesota.

6. U.S. v. Hartford-Empire Co. et al., 46 F. Supp. 541 (1942), 323 U.S. 386 (1944), 324 U.S. 570 (1944).

Court decision stated that district court judges could exercise "judicial discretion" in formulating remedies for patent-based antitrust law violations, royalty-free licensing of General Electric's electric lamp patents was imposed.[7]

The Hartford-Empire and General Electric cases were followed by numerous antitrust settlements in which compulsory licensing of patents was ordered to remedy monopolistic situations where patents played a significant role. Between 1941 and the late 1950s, compulsory licensing decrees had been issued in settlement of more than 100 antitrust complaints, covering inter alia AT&T's transistor and other telecommunications apparatus patents, IBM's computer patents, and DuPont's nylon and other synthetic fiber patents. The cumulative number of patents affected is estimated to have been between 40,000 and 50,000.[8] Although the pace abated after 1960, additional decrees covered the roughly one thousand patents in Xerox's plain-paper copying machine portfolio[9] and several pharmaceutical products. Many European nations had until recently laws allowing compulsory licensing of patents, notably, in cases where an invention was not actually produced within the patent-issuing nation. However, the cumulative number of compulsory licensing orders has seldom exceeded a dozen in the typical large European nation -- a far cry from the tens of thousands of patents covered by U.S. antitrust decrees. Most of the U.S. compulsory licensing decrees were entered by mutual consent rather than as the result of fully contested litigation. Only the General Electric decree imposed royalty-free licensing through a contested court order, but several others, including the AT&T order of 1956, entailed royalty-free licensing by mutual consent.[10]

3. Economic Impact Studies

The 1956 decree ordering the compulsory licensing of roughly 8,600 AT&T patents and the nearly simultaneous decree affecting IBM patents inspired particularly intense public scrutiny. The **Wall Street Journal** observed in an editorial:[11]

> So it may turn out that these are dangerous victories the Government boasts about. The settlements in these cases indicate a belief that everybody's patents should be everybody else's. But this is a philosophy that strikes at incentive; new ideas and new inventions may be lost. Such Government victories may turn out to be far more costly for the nation than for the companies.

Shortly thereafter eight colleagues and I formed a group to meet the requirement for a "topic report" in a Harvard Business School course taught by Georges F. Doriot, president of the first modern American high-technology venture capital group, the American Research and Development Corporation. We decided to study the incentive effects of compulsory licensing decrees. We read widely in the relevant literature (aided by studies commissioned under an ongoing Senate Judiciary Committee investigation); fanned out to interview 22 American corporations, many of whom had entered compulsory licensing decrees; received mail questionnaires from 69 companies holding 45,500 patents; and conducted an extensive statistical

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7. U.S. v. General Electric Co. et al., 115 F. Supp. 835, 844 (1953).

8. Marcus A. Hollabaugh and Robert Wright, Compulsory Licensing under Antitrust Judgments, staff report of the Subcommittee on Patents, Trademarks and Copyrights, Senate Committee on the Judiciary (Washington: 1960), pp. 2-5.

9. In the Matter of Xerox Corporation, decision and order, 86 F.T.C. 364 (1975).

10. U.S. v. Western Electric, Inc., and the American Telephone and Telegraph Co., CCH 1956 Trade Cases, Para. 68,246 (1956).

11. " Dangerous Victory," January 27, 1956, p. 6.

analysis of patenting trends. The results, privately-published in two book editions,[12] were profoundly surprising to us. We discovered that with rare exceptions, whether or not well-established corporations could expect patent protection was typically unimportant in their decisions to invest in research and the development of new products and processes. "Of far greater everyday importance," we concluded, "are reward structures related to the necessity of retaining market positions, of attaining production more efficient than competitors', of securing the corporation through diversification against disastrous product obsolescence, and of gaining short-term advantages which can be exploited by advertising and well-developed sales channels."[13] To be sure, there were exceptions -- notably, situations in which firms were making risky investments into fields where they had little technical or marketing experience, and arguably (since our sample included few startup companies) for small new enterprises seeking a competitive foothold against well-entrenched rivals.[14] We found also from interviews, mail survey responses, and statistical analyses that prior compulsory licensing decrees had little or no unfavorable impact on research and development decisions, although they had led to less patenting of the inventions actually made and hence greater reliance on secrecy, especially on (concealable) process as distinguished from readily observed product inventions. This finding was supported in a later statistical study, conducted when company R&D spending data first became publicly available, which showed that the companies subjected to compulsory licensing decrees spent more on R&D relative to their sales on average than unimpacted companies of comparable size in the same fields of technology.[15]

Unaware of our study, economists at Cambridge and Oxford Universities undertook similar research on how the absence of patent protection would affect the R&D behavior of British companies. They found that across all industries covered, the weighted average reduction in R&D expenditures if no patent protection could be obtained -- a condition more drastic than compulsory licensing with reasonable royalties -- would be eight percent.[16] However, in pharmaceuticals, a negative impact of 64 percent was predicted. Similar disparities between the incentive effect of patents in pharmaceuticals and other high-technology industries were revealed through particularly careful interviews with U.S. companies by Edwin Mansfield and colleagues.[17]

Many surveys have shown that the expectation of patent protection is much more important to investment in pharmaceutical R&D than in most industries. Drug R&D comes closest to what economists call the generation of knowledge as a pure public good. Most of the expenditure is directed toward finding molecules that might have interesting therapeutic action in human beings and then, through costly clinical

12. F. M. Scherer, S. E. Herzstein, Alex Dreyfoos, William Whitney, Otto Bachmann, Paul Pesek, Charles Scott, Thomas Kelly, and James J. Galvin, Patents and the Corporation: A Report on Industrial Technology under Changing Public Policy (2nd ed.: Boston: 1959). The first edition was published in 1958.

13. Ibid., p. 149.

14. The ambiguous situation of startup companies was characterized by the reaction of Professor Doriot when we told him about our contemplated research: "Hell, patents are simply instruments with which big companies bludgeon my startups."

15. F. M. Scherer, The Economic Effects of Compulsory Patent Licensing, New York University Monograph Series in Finance and Economics 1977-2 (1977), pp. 67-75.

16. C. T. Taylor and Z. A. Silberston, The Economic Impact of the Patent System (Cambridge University Press: 1973), p. 199.

17. Mansfield, "Patents and Innovation: An Empirical Study," Management Science, vol. 32 (February 1986), pp. 173-181; and Edwin Mansfield et al., "Imitation Costs and Patents: An Empirical Study," Economic Journal, vol. 91 (December 1981), pp. 907-918.

trials, ascertaining that the target molecule is really effective and safe.[18] Absent patents, once that evidence has been amassed, it might be available for any and all would-be generic imitators to exploit. All that may be needed for the free-rider (or more accurately, cheap rider) is to spend a sum on process engineering tiny relative to the amounts spent on discovery and testing, whereupon a competing molecule can be marketed (if regulatory rules permit). However, further research added a caveat to this conclusion and clarified the role of what came to be known as "first mover" advantages as a barrier to rapid new product imitation and hence as a substitute for patent protection. Comparing side-by-side two pharmaceutical entities, one unpatentable and one patented, Bond and Lean found that the erosion of the pioneer's price premium and market share was as slow for the unpatented product as for the patented product.[19] The reason, it became clear, was that being the first successfully to market a consumer product affixes in the mind of decision-makers an image of superiority and reliability that is hard for latecomers to surmount, whether the product is patented or not. However, it should be noted that the Bond and Lean study focused on products developed during the late 1950s, when regulatory strictures were more lax and the research and testing costs required to market a successful new drug entailed only about $1 million. By the late 1990s, the comparable costs had mounted to hundreds of millions of dollars, while the costs of engineering imitative generic products rose much less.

A major step toward confirming the role hoped-for patent protection plays in R&D decisions was taken by four prominent economists at Yale University.[20] They obtained elaborate survey responses from 650 U.S. R&D managers. One set of questions, emulating earlier inquiries for a smaller sample by Mansfield, asked how much R&D, measured relative to the first mover's R&D, would be needed to duplicate the first mover's innovation. For major patented new products, the average fraction was roughly 85 percent (weighting category ranges by response rates); for major unpatented products, 65 percent. Thus, patent protection raised imitation costs, but even without it, imitators could not simply "free-ride" on the innovator's work. The Yale group also asked respondents to rank on a scale of 1 ("not at all effective") to 7 ("very effective") the extent to which various instruments protected the competitive advantages from new and improved products and processes. The average scores across 130 industrial lines on the effectiveness of various means to reap the economic benefits of new and improved products were as follows:

- Patents to prevent duplication 4.33
- Patents to secure royalty income 3.75
- Secrecy 3.57
- Being first with an innovation 5.41
- Moving quickly down learning curves 5.09
- Superior sales or service efforts 5.59

18. For a survey, see F. M. Scherer, Industry Structure, Strategy, and Public Policy (HarperCollins: 1996), pp. 357-362.

19. Ronald S. Bond and David Lean, Sales, Promotion, and Product Differentiation in Two Prescription Drug Markets. Federal Trade Commission Staff report (Washington: February 1977). See also William D. Robinson and Claes Fornell, "Sources of Market Pioneer Advantages in Consumer Goods Industries," Journal of Marketing Research, vol. 22 (August 1985), pp. 305-317.

20. Richard C. Levin, Alvin Klevorick, Richard R. Nelson, and Sidney Winter, "Appropriating the Returns from Industrial Research and Development," Brookings Papers on Economic Activity (1987, no. 3), pp. 783-820.

Having patent protection was found on average to be relatively unimportant compared to three other ways of gaining first mover advantages. For new and improved processes, it was even less important on average, while, not surprisingly, secrecy was ranked more highly than either of the patent measures. There were, to be sure, exceptions. Among 77 industry groups with three or more responses, the pharmaceuticals industry ranked duplication-preventing patents as the most important means of holding off imitative competition, second in average score only to the agricultural chemicals field (with environmental effect test regulations similar to those imposed for pharmaceutical efficacy and safety).

Generally similar responses were obtained in an even larger Carnegie-Mellon University survey during the late 1990s to which more than a thousand industrial laboratory managers responded.[21] Using a somewhat different scale than the Yale survey, respondents were on asked what percentage of their product innovations various means of protecting profits were effective. Patent protection had the second lowest average score of 34.83 percent, undercut only by "other legal" mechanisms. Lead time was viewed as the most important means, with an average score of 52.76 percent. Secrecy received much higher weight than in the Yale survey, with a 51 percent average, followed by complementary manufacturing capabilities (46 percent), complementary sales and service efforts (43 percent). As in the Yale survey, patents received an unusually high score in pharmaceuticals, second only among 34 broad industry categories to television and radio equipment (a puzzling result for the late 1990s, by which time Asian manufacturers dominated the field).

Important lessons emerge from these queries addressed to real-world managers. First, alternative barriers to rapid imitation -- the substantial R&D costs imitators have to incur, lags in recognizing opportunities, image and cost advantages accruing to the first mover, and the like leave a substantial class of cases in which would-be innovators can anticipate revenue gains exceeding their innovation and production costs even when patent protection is totally absent. Second, given that non-patent stimuli to innovation exist, established firms are driven to undertake their own innovation efforts for fear of being overtaken by more aggressive rivals. This is the Schumpeterian "creative destruction" effect.[22] Third, patent protection does substantially enhance profit expectations in some industries -- e.g., much more so in industries with characteristics such as pharmaceuticals than in semiconductors or computers. Fourth, there may be complex and conflicting feedback effects from patent protection to Schumpeterian creative destruction. Patent protection may help trigger a wave of innovation that threatens established firms, but to the extent that it lessens the threat to established firms, it weakens their incentives to maintain a vigorous innovative pace.

These lessons appear to have trickled out at best slowly to the legal and policy-formulating communities. My own experience presenting them to audiences of patent attorneys reminded me of Jan Hus's experience defending his heretical views before represent-atives of the Vatican in Constance during 1415.[23] One might have expected them to have been especially relevant to legal scholars. However, a search of **Social Sciences Citation Index** for 1987 through May 2006 revealed that only 11 percent of the 496 citations received by the principal Levin et al. paper -- the most acclaimed of the various patent survey reports, and with an appropriately high citation count -- were in legal journals.

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21. Wesley M. Cohen, Richard R. Nelson, and J. Walsh, "Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S. Manufacturing Firms Patent (or Not)," working paper, February 2000.

22. Joseph A. Schumpeter, Capitalism, Socialism and Democracy (Harper: 1942), especially Chapter VII.

23. Alvin Klevorick reported a more favorable reception presenting his group's findings to more selective audiences.

The diffusion to economists also left something to be desired. Beginning in the early 1980s, there was an explosion of theoretical work on the economics of the patent system.[24] However, nearly all of the theoretical contributions assumed -- contrary to the empirical evidence -- that patent protection was the only or principal barrier to rapid imitation of an invention or innovation. Clearly, economists were delinquent in providing an adequate theoretical basis for policy reforms.

4. The Impeti to Policy Change

During the 1970s, new initiatives for patent policy change began accelerating in the United States. One might ascribe the changes to the cyclical character of patent policy change observed in the historical past, or to the increased susceptibility of the U.S. government to interest group lobbying. On the latter we shall have more to say later. There was, however, another impetus on the macroeconomic front.

In 1969, productivity -- output per hour of labor input -- in the nonfarm business sector of the U.S. economy dropped and then entered a period of significantly diminished annual growth. By 1980, productivity was 15 percent less than it would have been had it continued the 2.5 percent annual growth rate it experienced from 1947 through 1969. By 1985, the shortfall was 20 percent. Also, company-financed R&D expenditures by U.S. industry, adjusted for general inflation, experienced the first break from a rising trend since the collection of statistics was initiated beginning with the year 1950. Further year-to-year declines occurred, and even in the good years growth was slower, so that by 1981, a 28 percent shortfall had accumulated.[25] Research by David Ravenscraft and myself tapping data from a small but unusually detailed sample of company business units revealed that the decline in R&D spending was probably attributable to a drop in the profitability of R&D investments, and when R&D was cut back, its profitability rose again, precipitating new growth.[26]

Two seminal papers published simultaneously in 1967 showed that, contrary to conventional wisdom among economists, the United States could attribute much of its comparative advantage in international trade to superior technological innovation.[27] As the industrial nations of Western Europe and especially Japan recovered fully from the devastation of World War II, however, they began aggressively to challenge U.S. corporations for technological leadership.[28] In 1975, U.S. exports of high-technology

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24. See my paper, "Patents: What Do We Know; What Must We Learn?" in the proceedings of a November 1996 conference in Luxembourg on Appropriability and Patent Value: Econometric Aspects, which shows that the number of articles covered by the ECONLIT bibliography with "patent" or some compound thereof in their titles rose from an average of four per year between 1969 and 1982 to 23 per year between 1984 and 1995.

25. See F. M. Scherer, "R&D and Declining Productivity Growth," American Economic Review (May 1983), pp. 215-218.

26. David Ravenscraft and F. M. Scherer, "The Lag Structure of Returns to R&D," Applied Economics, December 1982, pp. 603-620. For similar results with the pharmaceutical industry, see F. M. Scherer, "The Link Between Gross Profitability and Pharmaceutical R&D Spending," Health Affairs, September/October 2001, pp. 216-220.

27. William Gruber, Dileep Mehta, and Raymond Vernon, "The R&D Factor in International Trade and International Investment of United States Industries," and Donald B. Keesing, "The Impact of Research and Development on United States Trade," Journal of Political Economy, vol. 75 (February 1967), pp. 20-48.

28. For statistical analyses and eleven case studies, see F. M. Scherer, International High-Technology Competition (Harvard University Press: 1992).

goods exceeded imports by a ratio of 2.4 to 1. By 1980, the ratio had declined to 1.95 to 1 and by 1985 to 1.05 to 1.[29] The first reaction of U.S. industries to high-technology challenges from abroad was on average what the theory of arms races calls "submissive," i.e., a relative decline in R&D outlays. Some industries such as steel, automobile tires, and television sets essentially gave up. But others such as the producers of integrated circuits, medical imaging apparatus, optical fiber cables, and (less unambiguously) airliners responded aggressively and redoubled their R&D efforts to retain or regain their world market positions.

It was argued, among other fora in Congressional hearings, that patent policy reforms could help restore U.S. technological leadership. Perhaps, but the chains of causation were clearly more complex.[30] Reductions in corporate R&D spending were precipitated by a fall in profitability. If stronger patent protection could restore profitability, it might facilitate a resurgence. And it was true that the most formidable new rival to U.S. technological leadership, Japan, maintained a much weaker patent system, among other things requiring the licensing of most patents and limiting through foreign exchange controls the royalties Japanese firms could pay U.S. patent holders.[31] But the exercise of patent rights within the United States did blunt some Japanese challenges, e.g., in optical fibers and integrated circuits.

Alternatively, however, the profits from innovation may have declined because the pool of attractive technological opportunities had been depleted following intensive "fishing" during the decades following World War II. In this sense, the productivity growth slump that began around 1969 was an extension of the so-called Kondratief cycles emphasized by Joseph A. Schumpeter in a 1939 classic.[32] Industrial research and development efforts were intensified in those industries that elected to fight back against tougher foreign competition.[33] But more importantly, growth was restored, sometimes with long lags, as a result of fundamental scientific and technological breakthroughs that underlay the information and biotechnology revolutions of the late 1990s and the early 21st century -- notably, the invention of integrated circuits around 1959 and microprocessors in the early 1970s and the steady cost declines that occurred through learning-by-doing and denser circuit-packing; the laser in the late 1950s and optical fiber data transmission during the 1970s; and gene splicing during the early 1970s. Patents played some role in all of these breakthroughs, but given uncertainties, long lags, and the university origins of key breakthroughs, hardly a precipitating role. The Department of Defense insisted upon widespread licensing

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29. U.S. National Science Board, Science & Engineering Indicators: 1989 (Washington: 1989), p. 379. Later editions of the same report show a more modest decline because of a redefinition of what constituted high-technology industries.

30. For similar arguments, see Richard Posner, "The Insignificance of Macroeconomics in Patent Antitrust Law: A Comment on Millstein," Cardozo Law Review, vol. 9 (1988), pp. 1203-1207. The paper on which Posner commented, by Ira Millstein, chief counsel at the time to the influential Business Roundtable, considered studies such as those by Levin et al. "inconclusive" and argued that the effects of non-patent barriers "do not make the patent a less significant inducement."

31. See Daniel Okimoto, Between MITI and the Market (Stanford University Press: 1989), pp. ---; and Janusz Ordover, "A Patent System for Both Diffusion and Exclusion," Journal of Economic Perspectives, vol. 5 (Winter 1991), pp. 43-60.

32. Joseph A. Schumpeter, Business Cycles (McGraw-Hill: 1939). For the most persuasive empirical support, see Alfred Kleinknecht, Innovation Patterns in Crisis: Schumpeter's Long Cycle Reconsidered (St. Martin's: 1987). For an analysis from the 1970s and 1980s skeptical of the general depletion hypothesis, see Martin N. Baily and Alok Chakrabarti, Innovation and the Productivity Crisis (Brookings: 1988). For theoretical support rooted in the logic of highly skew payoff distributions, see William D. Nordhaus, Comment, Brookings Papers on Economic Activity: Microeconomics (1989), pp. 320-325.

33. International High-Technology Competition, Chapter 5.

of integrated circuit patents, and several early developers of microprocessors cross-licensed their patents among one another and to other chip makers.[34] A small fortune was made through broad-based licensing of basic laser patents by the winner of a law suit claiming priority of invention, but only after more than two decades of litigation.[35] From a beginning in 1980, the Cohen-Boyer gene splicing patents were licensed at modest royalties to hundreds of entities by Stanford University and the University of California, yielding cumulative total royalties to the two universities of some $124 million by 1995.

5. How Patent Policy Was Changed

We turn now to our analysis of the principal changes in U.S. patent policy, focusing mainly on events of the late 1970s and early 1980s.

Copyright Law

Changes in copyright law may have been precursors to what happened on the patent front, so a brief look is warranted. As of 1962, the life of a copyright was limited to 28 years, with one 28-year renewal to 56 years allowed. Then, in the four decades that followed, Congress extended copyright lives eleven times, so that by the turn of the century, works were copyrighted for 70 years beyond the life span of the copyrighted work's creator.[36] In 1976, copyright extensions were made automatic, without the need to apply or register. According to Kevin Kelly, these changes occurred as an increasing number of creative works came to be owned not by individuals but by corporations able successfully to lobby Congress to prevent materials from returning to the public domain. Or as Lawrence Lessig concludes (p. 304), "The law speaks to ideals, but it is my view that our profession has become too attuned to the client. And in a world where the rich clients have one strong view, the unwillingness of the profession to question or counter that one strong view queers the law."

Patents from Government-Supported Research

World War II and its aftermath, including the cultivation of basic science through the National Science Foundation and the development of atomic energy, brought the U.S. federal government into extensive technological cooperation with private industry and universities. Who should have primary rights to patents resulting from government-financed R&D was a question settled in a diversity of inconsistent ways. Some clarity was brought through a policy statement issued by President John F. Kennedy in 1963,[37] but debate continued. In 1965 an inter-agency task force, the Committee on Government Patent Policy, operating under the auspices of the Federal Council for Science and

34. Texas Instruments later collected an estimated $1 billion in royalties on its integrated circuit patents until it lost key lawsuits in Japan and the United States. "New Profits from Patents," Fortune, April 25, 1988, pp. 185-188; "When Copying Gets Costly," The Economist, May 9, 1992, p. 95; "Chip Patent Suit by Texas Instruments," New York Times, June 30, 1992; and "Texas Instuments' Shares Fall on Ruling," New York Times, September 1, 1994.

35. " Now the Father of the Laser Can Get Back to Inventing," Business Week, February 17, 1986, p. 98; and "An Unexpectedly Bright Idea," The Economist Technology Quarterly, June 11, 2005, pp. 25-29. Had Bell Laboratories won the lawsuit, it would have been required under its antitrust decree to license the patents non-exclusively.

36. See Lawrence Lessig, Free Culture: How Big Media Uses Technology and the Law To Lock Down Culture and Control Creativity (Penguin: 2005), pp. 134-135; and Kevin Kelly, "Scan This Book," New York Times Magazine, May 14, 2006, p. 48.

37. The Kennedy memorandum was published in the Federal Register, vol. 28 (October 10, 1963).

Technology, undertook an ambitious empirical study of how the various patent policies were working. It hired a consulting firm, Harbridge House, to compile data on 2,024 patents made under government contracts and several hundred more originating in government laboratories, and to conduct a series of historical case studies on attempts to bring inventions conceived with government financial support into private-sector utilization. Harbridge House completed several interim volumes and, in May 1968, a four-volume compendium of research findings.[38] The Committee on Government Patent Policy published its own report and patent policy recommendations on the fall of 1968[39] and presented them at a briefing conference before the Federal Bar Association in September 1969. The Committee's recommendations, which emphasized flexibility in allowing contractors to obtain exclusive patent rights mainly when there were prospects of commercial utilization or when granting exclusive rights broadened the government's potential contractor base, formed the basis for a new policy statement issued by President Nixon in August 1971.[40]

The Harbridge House research revealed that several variables affected the likelihood that government contract-originated inventions would be commercially utilized: (1) the intrinsic relevance of the technology to civilian needs; (2) whether the contractor had prior commercial experience in the relevant field; (3) how far the development had been carried under contract; (4) the magnitude of additional development outlays required in comparison to the market size and the risks attendant thereto; and (5) whether or not the contractor or another assignee had exclusive patent rights. For 1720 patents on which complete data were available, commercial utilization rates varied over two key variables as follows:[41]

	Contractor Had Prior Commercial Experience	Without Prior Commercial Experience
With exclusive rights	23.8%	6.6%
Without exclusive rights	13.3%	2.2%

Evidently, patent protection mattered, although the chain of causation remained ambiguous. In some cases, the qualitative studies showed, exclusive rights encouraged investments in commercial utilization; in others, contractors bargained more vigorously to obtain exclusive rights when commercial utilization was expected.

The pharmaceutical industry was found again to be an extreme case. One in-depth Harbridge House study revealed that, up to 1962, drug companies routinely screened new organic molecules synthesized by academic researchers under government grants.[42] However, when the Department of

38. Harbridge House, Inc., Government Patent Policy Study, published in loose-leaf binder form, May 1968. The summary report is reproduced in U.S. House of Representatives, Committee on Science and Technology, Background Materials on Government Patent Policies, Vol. II (August 1976), pp. 69-140.

39. It is reproduced in Background Materials, vol. II, pp. 143-182. I served as principal economic adviser to the Committee throughout the Harbridge House study period.

40. Federal Register, vol. 36 (August 1971). It is reproduced in volume I of the House Committee on Science and Technology, Background Materials, pp. 11-23.

41. This analysis is drawn from Scherer, The Economics of Compulsory Patent Licensing, pp. 78-84.

42. Harbridge House Inc., Report, "Effects of Government Patent Policy on Drug Research and New Product Development" (Boston: 1967), Sections I and IV.

Health, Education, and Welfare imposed new reporting requirements that threatened exclusivity of drug companies' rights to commercialize molecules found to be therapeutically interesting, such testing ceased abruptly. The moratorium ended in 1968 when HEW changed its policies to allow drug companies exclusive rights on grant-originated molecules they tested.

A particularly controversial question at the time was whether, when a government agency allowed its contractors to obtain exclusive patent rights, the government should retain "march-in" rights to require wider licensing of the patent if there was a failure to commercialize or there were monopolistic abuses in commercialization. Cases of clear abuse were found to be rare, in all but one questionable instance because adequate substitute products existed. Both the Committee on Government Patent Policy and the Nixon memorandum recommended retention of march-in rights, to be used flexibly and presumably rarely under an implicit rule of reason, or in cases of jeopardy to public health or safety.

The U.S. Congress chose in due course to insert its own views into the debate. In 1965 S. 1809, embodying compromise policies, was approved by the Senate Judiciary Committee, but in 1967 its consideration by the full Senate was postponed indefinitely pending completion of the Harbridge House Study.[43] A draft bill was proposed to Congress by the White House in August 1976, supplanted by a bill drafted in the House of Representatives.[44] Hearings in 1976 before the House Committee on Science and Technology summoned as witnesses the executive secretary of the Committee on Government Patent Policy and others affiliated with it along with representatives of the principal government R&D contract-issuing agencies, industry, and an organization comprising university patent administrators. The Harbridge House report summary and related documents were published as background materials. No legislation ensued at first, but in subsequent sessions of Congress, further hearings were held by the House Science Committee as well as the Monopolies subcommittee of the House Judiciary Committee. The latter hearing, in December 1977, added substantive balance, inviting as witnesses inter alia outspoken Admiral Hyman Rickover (father of the Navy's nuclear submarine program), Walter Adams (an economist well-known for his anti-monopoly views), and the consumer activist chairman of the Federal Trade Commission.

After characteristic delays, two major bills emerged from the effort, the Bayh-Dole Act, signed into law in December 1980;[45] and the Stevenson-Wydler Act, passed in October 1980.[46] The floor debates were brief, and both bills sailed through Congress (controlled in both houses by Democrats) on voice votes. Bayh-Dole reversed the prevailing but flexible presumption that the government would retain title to inventions made under R&D contracts. It articulated a presumption that government contracts or grants to academic researchers or small businesses would normally permit patent rights to be retained by the contractors, subject to march-in under imprecisely articulated conditions. A 1987 executive order extended it to apply to all government R&D contract recipients, regardless of their size.[47] Stevenson-Wydler required the principal government agencies conducting R&D in-house to set up Research and Technology Applications offices. Since "the whole point of [the] bill [was] to stimulate the commercialization of industrial innovations," as one Congressional proponent observed in the final debate,[48] the offices were

43. Howard Forman, "Retrospection and Introspection Concerning Patents and Government Patent Protection," Journal of the Patent Office Society, vol. 49 (September 1967), pp. 687-688.

44. They are reproduced in Federal Council for Science and Technology, Report on Government Patent Policy (Washington: 1976), pp. 88-119.

45. PL 96-517, 94 Stat. 3019.

46. Public Law 96-480 or 418 [check], 94 Stat. 2311.

47. 3 C.F.R. 220 (1988).

encouraged to negotiate exclusive patent licenses with industry for inventions resulting from agency research. In 1986, the Federal Technology Transfer Act extended Stevenson-Wydler to permit formation of cooperative research and development agreements (CRADAs) between government laboratories and industry, with the industrial partners retaining principal patent rights subject to standard march-in provisions.[49]

These legislative patent policy changes had important implications. Academic institutions in particular changed their behavior. Many which had not done so already created technology licensing offices to encourage patenting of relevant inventions by faculty researchers. University patenting rose sharply -- from an average of 332 patents received per year during the last three years of the 1970s to 952 per year in the last three years of the 1980s. At least part of the increase appears to have been caused by the imposition of lower standards on the patents sought. There was a marked decline in the number of subsequent citations received by the average university patent following the law change.[50] Links between university researchers and their industry counterparts increased in number and intensity, with an undoubted positive impact on the commercialization of academic research, especially in the field of biotechnology. Whether academic research as a result has been diverted at least marginally from basic to more applied goals and whether discoveries are disclosed more slowly so as not to jeopardize patentability is less than certain. To the extent that such consequences have followed, their desirability continues to be debated.[51]

Especially in academic circles, but also on inventions made cooperatively with government laboratories, serious questions have arisen over the resulting product prices. As we have seen, patents are of special importance to pharmaceutical (and related biopharma-ceutical) companies, in part because they provide strong protection from competitive imitation on products that often have relatively inelastic demands. This means that high prices can be commanded. AZT (azidothymidine), the first antiretroviral effective against AIDS, was synthesized by a medical institute researcher with federal research support.[52] After the unpatented molecule was offered to the National Institutes of Health by the private firm Burroughs-Wellcome, its therapeutic efficacy was demonstrated in clinical trials conducted initially at NIH and Duke University with significant support from federal government funds. Burroughs-Wellcome was able to obtain "method of use" patents covering AZT along with exclusive marketing rights reflecting AZT's early "orphan drug" status. It chose to sell AZT at annual costs per patient approximating $10,000 when production costs could not have been more than $2,000. This pricing strategy provoked outrage among AIDS advocates and members of Congress plus demands that the National Institutes of Health exercise their march-in rights to require the issue of non-exclusive patent licenses. That was not done, but Burroughs-Wellcome eventually implemented substantial price reductions in response to the public pressure. Several other drugs conceived or developed with federal government support have had similar high-price histories. What could have been the most egregious case was thwarted by a judicial finding of

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48. Congressional Record, September 8, 1980, p. 24566.

49. Public Law 99-502, 100 Statutes 1785 (October 1986). Check march in provisions.

50. See Rebecca Henderson, Adam Jaffe, and Manuel Trajtenberg, "Universities as Sources of Commercial Technology," in Jaffe and Trajtenberg, Patents, Citations & Innovations (MIT Press: 2002), pp. 252-256.

51. See e.g. Derek Bok, Universities in the Marketplace (Princeton University Press: 2003), pp. 10-12 and 140-143.

52. This discussion benefits from a case study, "AZT: A Favored Orphan?" written by Kris Thiessen at the John F. Kennedy School of Government in 1998.

patent invalidity after the University of Rochester sought royalties it expected to reach $3 billion from its work, supported by a National Institutes of Health grant, underlying the development of Cox-2 inhibitors.[53]

The National Institutes of Health directorate has declined to exercise its Bayh-Dole march-in rights on patents covering drugs sold at particularly high prices. Indeed, as of 2005, the march-in provision had never been invoked by a government agency. There appear to be two main reasons. For one, the leadership of NIH claimed to an investigator that it had no experience determining what a reasonable price was and did not consider implementing price controls to be part of its mission.[54] Also, the law itself left ambiguities. The relevant march-in clause states in part that the granting agency has the right to compel issuance of non-exclusive licenses when:[55]

(1) [T]he contractor or assignee has not taken ... within a reasonable time ... effective steps to achieve practical application of the subject invention... [or]

(2) [A]ction is necessary to alleviate health or safety needs which are not reasonably satisfied by the contractor, assignees, or their licenses.

Debate centers on the meaning of the reasonable satisfaction of needs provision. In response to a critical article in the **Washington Post**[56], the Bayh-Dole Act's co-sponsors insisted that the march-in rights are not contingent upon the pricing of a resulting product or the profitability of the commercializing company, but they can be invoked only "when the private industry collaborator has not successfully commercialized the invention as a product."[57] This seems an unreasonable interpretation of subparagraph (2) above even if not (1),[58] but on such fuzzy constructs, reasonable people can disagree.

53. "University's Patent for Celebrex Is Invalid," New York Times, February 14, 2004. See University of Rochester v. G.D. Searle Co. et al., 358 F. 3d 916. In November 2004 certiorari was declined by the Supreme Court. See also "Jury Rules Company Infringed Drug Patent," Harvard Crimson, May 5, 2006, reporting on a Federal District Court finding in favor of royalties for a fundamental biological pathways discovery by Harvard University researchers licensed to a biotech company. The case was Ariad Pharmaceuticals v. Eli Lilly Co. et al., Federal District court, Massachusetts.

54. Private communication from the investigator to the author. See also David Korn and Stephen Heinig, "Recoupment Efforts Threaten Federal Research," Issues in Science and Technology, Summer 2004, pp. 24-29.

55. 35 U.S.C. Sec. 303 (a) (1) and (2).

56. Peter Arno and Michael Davis, "Paying Twice for the Same Drugs," Washington Post, March 27, 2002, p. A-21.

57. Birch Bayh and Bob Dole, "Our Law Helps Patients Get New Drugs Sooner," Washington Post, April 11, 2002, p. A28.

58. For an extended discussion, see Peter S. Arno and Michael H. Davis, "Why Don't We Enforce Existing Drug Price Controls?" Tulane Law Review, vol. 75 (.... 2001), pp. 631-693.

A Special Court for Patent Appeals

The status quo as the 1970s began was for patent case decisions at the Federal district court level to be appealed to any of the ten regional appellate courts, while appeals from decisions of the U.S. Patent and Trademark Office went to a special Court of Customs and Patent Appeals, sitting in Washington, D.C. There was considerable discontent over conditions in the appellate courts. Quite generally, an increased number of appeals with little expansion in the number of judges led to a perceived overload situation. Patent cases, which amounted to less than one percent of all decentralized appeals, were only a small part of the problem, although it was said (without clear quantitative evidence) that patent appeals were more complex than the average appeal. Patent advocates were unhappy over what they claimed to be wide differences in the outcomes of their appeals, allegedly because some appellate courts took a tougher line toward the validity of challenged patents, and on whether patents passing the validity screen were actually infringed, than others. This was said to have led to "forum shopping" -- patent owners sought venue in appellate courts friendly toward patent protection while alleged infringers sought more skeptical courts. Differences between courts in legal precedents were also an alleged problem, and inter-court differences were seldom carried to the Supreme Court for resolution. Patent advocates sought a unified appellate forum that would minimize forum-shopping and generate consistent precedents.

Appellate court reform questions were addressed repeatedly by diverse study groups. One of the most thorough was the so-called Hruska Commission, chaired by Senator Roman Hruska, which delivered its conclusions in 1975.[59] It favored creation of a new nationwide appellate court to which matters that posed important precedential questions (inclduing patent cases) would be **transferred** at the behest of the normal appellate courts, which would retain jurisdiction over most patent appeals from federal district courts. Or alternatively, cases could be referred to the court by the Supreme Court when the high court was reluctant to hear an appeal itself. However, the proposal to create a separate court hearing all appeals on patents or other specialized subject matter was soundly rejected (a point largely neglected in subsequent Congressional reports and debate). The Commission warned that:[60]

> ... [T]he quality of decision-making would suffer as the specialized judges become subject to "tunnel vision," seeing the cases in a narrow perspective without the insights stemming from broad exposure to legal problems in a variety of fields.... Judges of a specialized court, given their continued exposure to and greater expertise in a single field of law, might impose their own views of policy even where the scope of review under the applicable law is supposed to be more limited.... [I]ndeed the court as a whole may be "captured" by special interest groups.

A consultant to the Commission found that among 90 identified conflicts on legal doctrines at the U.S. appellate court level, only three were in the patent field.[61]

Nevertheless, prodded in part by President Carter, the U.S. Congress began considering bills (H.R. 3806, 2405, and eventually H.R. 4482 and S. 1700) that would create a unified new Court of Appeals for the Federal Circuit with jurisdiction over all patent appeals as well as federal contract dispute claims, customs matters, and an array of other subject matter that was pruned back in Congressional committees. The bill was passed in both houses of Congress but became bogged down through unrelated procedural complexities in late 1980. It was called up again in the 97th Congressional session beginning in January

59. Its report is reproduced as "Proposed Revision of Appellate System," 67 F.R.D. 195 (1975).

60. 67 F.R.D. 195, 234-235 (1975). See also Marver Bernstein, Regulating Business by Independent Commission (Princeton University Press: 1955), pp. 116-117.

61. 67 F.R.D. 195, 196 (1975).

1981 -- a Congress in which Republicans had gained a majority in the Senate while Democrats retained control of the House. New hearings were held. Two witnesses at the principal House Judiciary Committee hearing were judges from existing courts who would be automatically promoted to the new court and another was a company patent attorney who would later be appointed to the new court. In addition to a former Commissioner of Patents, other witnesses represented the American Patent Law Association, the American Bar Association, the Industrial Research Institute (presumably reflecting the views of R&D-oriented corporations), and an independent committee opposing the new law, one member of which had testified in an earlier hearing on behalf of the American Bar Association.

The Bar Association was split. Some of its patent law members, and especially those who practiced in Washington, D.C., favored the bill. Others were against it. The ABA had created committees to consider the proposal for a centralized patent appeals court. At its plenary meeting in February 1980, a majority of the members present voted against it.[62] The ABA representative at hearings in April 1981 reported "very, very substantial division in views among patent lawyers;" said that the forum shopping claim was overblown; and testified that:[63]

> Uniformity, without more ... is quite plainly not a desirable objective. The legal system as a whole reaps the reward that various ideas are able, in the words of Mr. Justice Holmes, to "compete for acceptance in the marketplace" such that the law is refined and grows in a rational and just manner.

A House committee report following the hearings recommended creation of the new court by merging the existing federal Court of Customs and Patent Appeals and the Court of Claims, with jurisdiction mainly for the subject matter of those lower courts but handling patent appeals from all federal circuits. It observed that the responsible Subcommittee had inquired "deeply into technological innovation as an element of productivity in the American marketplace" and cited witness testimony arguing that the new court would be "one of the most far-reaching reforms that could be made to strengthen the United States patent system in such a way as to foster technological growth and industrial innovation."[64] There was no focused testimony on the causes of the productivity slump or on how changes in patent policy might be expected to remedy it.

During the most extended debate on the bill, a list was presented of individuals and organizations that had, usually through letters, supported passage of the bill.[65] Among 85 corporations favoring the bill, including two universities, 76 of the letters were signed by patent attorneys and only five by individuals whose titles suggested broader responsibilities. Among the 20 organizations cited for their support (none with responsible individuals identified), six were patent law groups, two federal bar associations, six business interest groups, and two were American Indian tribes. If one understands how Washington works, one must infer that lobbyists in favor of the new court were active.

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62. See the testimony of Benjamin L. Zelenko at the June 1980 hearings, reproduced as an appendix in U.S. House of Repre-sentatives, Committee on the Judiciary, Subcommittee on Courts, Civil Liberties and the Administration of Justice on H.R. 2405 (April 1981), p. 422.

63. Testimony of James W. Geriak in the Hearings on H.R. 2405, April 1981, supra note 58, p. 85.

64. House of Representatives, Committee on the Judiciary, Report together with Dissenting Views, Court of Appeals for the Federal Circuit Act of 1981 accompanying H.R. 4482 (November 4, 1981), pp. 20 and 27.

65. Congressional Record, Nov. 17, 1981, pp. 27793-4.

One amendment made to the bill during its journey through Congress was a statement of the sense of Congress that the quality of the Federal judiciary is determined by the competence of its judges, and that President should nominate as judges for the new court "from a broad range of qualified individuals" -- a counterfoil to the charge that the court's judges would be narrow specialists.[66]

In the definitive House of Representatives roll call vote on the bill November 18, 1981, 321 voted in favor and 76 against. Among Democratic congressmen, the vote in favor was 9.5 to 1; among Republicans (in the minority), 2.2 to 1. A regression analysis of the vote division introduced three explanatory variables:

DEM Dummy variable; 1 if Democrat, 0 if Republican.

RAND Research and development expenditures in 1981, millions of dollars per million population in a representative's home state.[67]

PROPAT The percent of cases in which patents were found to be both valid and infringed on appeal in the representatives' home appellate circuits between 1953 and 1977.[68]

The resulting regression equation in ordinary least squares[69] was as follows, with VOTE scaled as 1 for a "yes" vote and 0 for a "nay" vote, and with t-ratios in subscripted brackets:

VOTE = 0.706 + 0.222 DEM + 0.00033 RAND - 0.0035 PROPAT;
[10.75] [5.83] [2.31] [2.04]

$R^2 = 0.112$; N = 394.

The preponderance of Democratic support is verified, holding constant other variables. Representatives from states with relatively intensive R&D activity were more likely to support the bill, all else equal. Surprisingly, representatives from circuits with a high prior incidence of decisions in favor of patent holders were more likely to vote against the court's creation, all else equal.

The vote in the Republican-controlled Senate on December 8, 1981, was more one-sided, with 83 votes in favor and only six nays, three from each party. And so the new Court of Appeals for the Federal Circuit (CAFC) was created, commencing its work on October 1, 1982.

Its initial complement of judges was inherited from the prior Court of Customs and Patent Appeals and Court of Claims. As of early 1983, four of the eleven sitting judges had backgrounds in patent law; seven others were from alternative backgrounds. The enabling statute urged the President to make new nominations "from a broad range of qualified individuals." A committee appointed by President Reagan to explore the sources of declining productivity growth and identify improvements recommended to the contrary that the President appoint "experienced patent lawyers to vacancies that occur in the new Court of

66. Section 305 (1) and (2).

67. The source is National Science Foundation, Research and Development in Industry: 1987 (NSF 89-323), pp. 55-56.

68. The data are from Jaffe and Lerner, Innovation and Its Discontents, p. 100.

69. Logit regressions were quite similar; the coefficients in OLS regressions are more easily interpreted as the amount by which the vote fraction shifts with a unit change in an explanatory variable.

Appeals."[70] The recommendation does not appear to have had much impact. In May 2006, the court, whose membership had turned over completely, had five active judges with patent practice backgrounds and six without. However, the court heard a spectrum of cases broader than merely patent matters. Although assignment to panels was in principle random, the choice of the judge who would report the panel's decision, and hence with the opportunity to set at least a precedential tone, was far from random. A study by John Allison and Mark Lemley revealed that in 143 patent validity decisions rendered by the Court between 1989 and 1996, 63 percent of the decisions were written by judges with prior patent practice experience, even though the judges with a patent background comprised only 38 percent of the total number of judges participating in panels hearing validity arguments.[71] Similarly, in a panel discussion among CAFC judges televised by C-SPAN3 on May 19, 2006, chief judge Paul Michel observed that the court did not want judges without patent law experience hearing patent cases and noted the importance of "cohesion" among the CAFC members.

Senator Robert Dole was quoted in the floor debate as saying in Judiciary Committee deliberations preceding the passage of S- 1700 that "the bill will not substantively affect current law."[72] However, affect it did. The changes were immediate and dramatic, but also subtle. Most significantly, the new CAFC proved to be much more generous than the decentralized appellate courts in ruling that patents whose validity was challenged on the basis of insufficient novelty or utility were in fact valid. The old courts rejected roughly two thirds of the patents on validity grounds; the new court accepted roughly two thirds.[73] This fed back to induce a higher acceptance rate at the district courts. With a validity ruling more likely, there were more attempts by patent holders to enforce patents, whose ultimate success depended then upon whether the courts ruled the relevant patents to have been infringed. The new appellate court's statistical record in infringement questions was more like that of the previous decentralized courts, and on one point -- interpretation of the so-called doctrine of equivalents -- the CAFC tended to view the scope of litigated patents somewhat more narrowly than its predecessors.[74] But with a higher fraction of patents found to be valid, the percentage of tested patents found to be both valid and infringed rose significantly.

The new court also blazed a trail toward accepting new kinds of patents, e.g., on business methods and computer software, on which the difficulties of showing that prior art would preclude patenting were particularly great, and (with Supreme Court encouragement[75]) an expanded array of life form inventions -- much wider than European Community chose to protect.[76] It proved more amenable to accepting jury

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70. White House Conference on Productivity, Productivity Growth: A Better Life for America (April 1984), p. 80.

71. Allison and Lemley, "How Federal Circuit Judges Vote in Patent Validity Cases," Florida State University Law Review, vol. 27 (2000), pp. 752-753.

72. Statement of Senator Charles Grassley in Congressional Record, December 8, 1981, p. 29887. I was told the same thing about the bill's intent by a member of the Senate Judiciary Committee staff at the time.

73. See Jaffe and Lerner, Innovation and Its Discontents, pp. 100-106; John R. Allison and Mark A. Lemley, "Empirical Evidence on the Validity of Litigated Patents," AIPLA Quarterly Journal, vol. 26 (Summer 1998), and Matthew D. Henry and John L. Turner, "The Court of Appeals for the Federal Circuit's Impact on Patent Litigation," Journal of Legal Studies, vol. 35 (January 2006), pp. 85-...

74. See Henry and Turner, "The Court of Appeals," supra note --. A key case was Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., 234 F. 3rd 558 (2000).

75. Diamond v. Chakrabarty, 447 U.S. 303 (June 1980).

76. For a survey 1,770 DNA sequence patents issued between September 1998 and June 2000, see F. M. Scherer, "The Economics of Human Gene Patents," Academic Medicine, vol. 77 (December 2002), pp.

findings, despite evidence that juries were more likely to be awed by claims of technical novelty than judges. It was more willing than the decentralized courts to grant preliminary and final injunctions eliminating infringers from a field -- although on this, its exertions may be restrained by a major Supreme Court pronouncement in 2006, the final resolution for which remains to be determined on remand to lower courts.[77] And very importantly, it revised the principles for assessing damages in cases of proven infringement, making it more likely that estimates of profits lost by the patent holder would err on the generous side, that the "profits lost" standard would normally be favored rather than the milder "reasonable royalty" standard, and awarding damages under both standards even though the later is logically subsumed within the former.[78] Under the new standards several damages awards running into the hundreds of millions of dollars were made.

These changes on balance strengthened patent protection, made it likely that companies found to be infringing valid patents would pay substantial damages, and hence raised the perceived benefits to companies (and universities) from building strong patent portfolios. Patent applications and patent issues soared in the years following the creation of the CAFC (marked by a dotted vertical line), as shown in Figure 1. A regression analysis shows a distinct and statistically significant break in the series at the year 1983,[79] with the growth rate of applications (less subject than patent issues to Patent Office backlog fluctuations) averaging 1.4 percent per year between 1955 (after postwar adjustments were made) and 1982, and 5.97 percent per year between 1983 and 2004. With many more patents being sought, more patent attorneys had to be hired. The number of patent attorneys per billion dollars of price level-adjusted industrial R&D expenditures rose from approximately 50 in the 1970s to 75 in the mid-1990s.[80] With many more patents being issued, specific areas of technology became more congested, leading to a higher likelihood that one firm's proprietary technology would conflict with another firm's.[81] In an analogue of an arms race, companies strove all the more vigorously to expand their patent portfolios so they could use their patents in defensive counter-claims when accused of infringement. With many more patents and higher damages if one's technology were found to infringe another firm's patents, fielding new products became like walking through a mine field, with dire consequences from a misstep.

While stronger patent protection per se should have increased the profitability of innovation and hence stimulated R&D expenditures, all else equal, the increased danger from infringing another firm's patents exerted an opposite negative influence. Figure 2 shows the long-run trend of U.S. industrial expenditures on research and development from 1953, the first year covered by systematic surveys,

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1356-1359. See also Kyle Johnson and Fiona Murray, "Intellectual Property Landscape of the Human Genome," Science, vol. 310 (October 14, 2005), pp. 239-240.

77. eBay v. MercExchange, decided May 15, 2006.

78. See Cecil D.Quillen, Jr., "Innovation and the Current U.S. Patent System," forthcoming in the Virginia Law and Business Review (2006).

79. The F-ratio in a test of differences is 8.54 percent, which is highly significant statistically, with N = 20 and 81. The data, including only "utility" patents and not design or plant patents, were obtained from the Patent and Trademark Office web site.

80. John Barton, "Reforming the Patent System," Science, vol. 287 (March 17, 2000), p. 1933.

81. See e.g. Jaffe and Lerner, Innovation and Its Discontents, especially Chapter 2; Bronwyn Hall and Rosemarie Ziedonis, "The Patent Paradox Revisted: An Empirical Study of Patenting in the U.S. Semiconductor Industry," Rand Journal of Economics (Spring 2001, pp. 101-128); and Ziedonis, "When the Giants' Shoulders Are Crowded: Fragmented Rights and Incentives To Patent," working paper, March 2001.

through 2000. Outlays are measured in constant 1996 dollars. As in Figure 1, the plot is logarithmic, so that a straight line indicates a constant rate of growth. Factors other than the legal regime in which patents were administered -- notably, macroeconomic shocks, the energy shocks of 1973-74, and the advent of wholly new technologies such as the Worldwide Web -- had an obvious impact. The most that can be said is that there is no noticeable acceleration of the growth rate in R&D following the creation of CAFC. In a statistical test comparing the periods 1956-82 and 1983-2000, the rates of growth are insignificantly different.[82]

I conclude that the CAFC did change patent policy when the legislators who supported it said it would not, that the record of debates on the enabling bill contains no solid evidence that the change would in fact stimulate R&D, and that there is no evidence of an acceleration in company-financed R&D between the 27 years before the bill was enacted and the 18 years thereafter.

Pharmaceutical Patent Reforms

As the 1980s dawned, pharmaceutical manufacturers had two major complaints, leading eventually to the Hatch-Waxman Act of 1984.[83]

For the makers of relatively new, typically patented, drugs, the key problem was declining effective patent life. Responding to the record of adverse side effects found with the tranquilizer Thalidomide, the Kefauver-Harris Act of 1962 increased the Food and Drug Administration's power to ensure that new drugs were safe. It also required proof from well-controlled clinical trials of a new drug's efficacy as well as its safety. Clinical trial periods and FDA decision-making lengthened appreciably as a result -- to an average of 7.5 years, with considerable variation, between the time when the FDA authorized testing in human beings to the date at which approval for marketing a new drug (a so-called NDA) was granted. Typically, drug companies filed for patent protection when animal tests demonstrated possible therapeutic effects, about a year before human tests began. With an average lag between patent application and patent issuance just short of two years and a patent life (since changed) of 17 years from issue to expiration, new drug marketers enjoyed on average only 10 to 11 years from the initiation of marketing to patent expiration, at which point, in principle, generic competition could begin. Both directly and through their trade association, the Pharmaceutical Manufacturers' Association (PMA), the research-oriented drug companies sought relief from Congress in the form of patent life extension.

The generic drug manufacturers also had a problem. Because of restrictive FDA rules approved by the Supreme Court,[84] the obstacles to generic competition were substantial even after relevant patents expired. Generic producers were not able simply to "free ride" on the test results of the original drug producers, which, the pioneers claimed, generated data that were their exclusive property. Would-be generic producers were required to conduct their own clinical trials nearly as extensive as those of the pioneers. This barrier to imitation significantly discouraged generic entry.[85] Generic drug companies sought from Congress eased testing requirements taking advantage of an original drug's evident safety and efficacy, proved in both FDA-required tests and the marketplace.

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82. The F-ratio is only 1.33. Observations before 1956 are excluded because the National Science Foundation had not perfected its survey techniques. The source is National Science Foundation, Science and Engineering Indicators: 2004, vol. 2, pp. A4-5-6.

83. PL 98-417, 98 Stat. 1585.

84. U.S. v. Generix Drug Corp. et al., 460 U.S. 453 (March 1983).

85. See E. W. Kitch, "The Patent System and the New Drug Application," in R. L. Landau, ed., Regulating New Drugs (University of Chicago: 1973), pp. 81-108.

Extensive hearings were conducted by several Congressional committees.[86] The hearings were a model of how proposed legislation should be considered. They included not only top officials of the principal interested parties -- the PMA, the Generic Pharmaceutical Industry Association, the Food and Drug Administration, and various drug companies -- but also the government's Office of Technology Assessment, which had made a study of the various proposals; a leading economic researcher on the economics of pharmaceutical innovation; a university-based physician who had done important research on drug testing; consumer advocate Ralph Nader; and a representative of the AARP, among others. The relevant issues were thoroughly aired.

In the end, compromise language was negotiated by the two principal outside parties -- the PMA and the Generic Industry Association. It had two main parts. First, an extension on the life of one patent, chosen by the drug firm, would be allowed to compensate for regulation-mandated test and decision delays. The maximum extension, however, could not be more than five years or enough only to allow an effective patent life of 14 years from the time of FDA approval. Second, once patents expired, generic producers would be allowed to enter the market immediately on the basis of chemical analysis and abbreviated clinical tests -- typically involving 24 subjects -- showing that the generic version was chemically identical (i.e., bioequivalent) to, and was absorbed into a patient's bloodstream at approximately the same rate as, the original patented and FDA-approved drug. The most controversial part of the compromise, Section 202, the so-called Bolar amendment,[87] allowed generic drug makers to produce experimental quantities of a patented product "solely for uses reasonably related to ... the submission of information under a Federal law which regulates ... drugs" -- i.e., to conduct the trials demonstrating bioequivalence. In this way, the generic drug maker could submit its application to the FDA and, with luck, hit the ground running with its marketable product the day the original drug's blocking patent expired. The Bolar amendment established a new principle -- that experimental uses of a product might not be blocked by patent protection.[88]

The compromise was passed by overwhelming majorities in both houses of Congress. Within the pharmaceutical industry, however, controversy persisted. A cabal led by the Swiss-based company Hoffmann-LaRoche was displeased and saw to it that the president of the Pharmaceutical Manufacturers Association, Lewis Engman, who had played a key role in brokering the compromise that eventually reached Congress, was fired from his position.

The Hatch-Waxman Act had important effects. The share of all drug prescriptions dispensed in the United States and filled generically rose steadily from 19 percent in 1984, when the new law was

86. They include "Patent Term Restoration Act of 1981," hearings on H.R. 1937, H.R. 6444, and S. 255 before a subcommittee of the House Judiciary Committee, July to November 1981; Patent Term Extension and Pharmaceutical Innovation," hearings before the House Committee on Investigations and Oversight, February 1982; "Patent Term Restoration Act of 1983," hearings before a subcommittee of the Senate Judiciary Committee on S. 1306 (June-August 1983); and "Drug Legislation," hearings before the House Subcommittee on Health and the Environment on H.R. 1554 and H.R. 3605 (July-October 1983).

87. The name comes from a decision by the new Court of Appeals for the Federal Circuit in Roche Products Inc. v. Bolar Pharmaceutical Co., Inc., 733 F. 2d 858 (April 1984), preventing generic manufacturers from producing test quantities of a drug as long as the drug was under patent.

88. For an extension reversing the CAFC's narrow reading of the Bolar amendment and allowing use in investigating novel drugs as well as generics, see Integra LifeSciences v. Merck A.G. (Supreme Court, June 14, 2005).

passed, to 47 percent in 2000, with further increases expected. [89] Generic competition clearly became tougher.[90] Significant patent life extensions were also achieved, partly under the main terms of the Act and partly through strategic manipulation of provisions defining the various parties' rights in patent disputes.[91] The extension in patent lives should have increased industry profits, but more rapid and extensive generic competition worked in the opposite direction. Industry profitably did increase markedly after passage of the Act,[92] but the rising trend began three years earlier and had two other plausible causes -- the advent of so-called "rational drug design" in which scientific knowledge played a larger role, and the rapid spread of health insurance plans with drug expenditure reimbursement, which reduced the elasticity of demand and hence supported increased prices for patented drugs sold under monopolistic conditions.

A plausible argument can be advanced that the Act shaped an ideal compromise in terms of stimulating pharmaceutical innovation. Longer patent protection had at the margin its desired effect in increasing the profitability of a given efficacious new drug. Less widely recognized, but equally true, the acceleration of generic competition forced pharmaceutical makers to intensify their efforts to discover and test improved replacement products, for without them, the sales and profits from a patented drug can be expected to plummet shortly after patent expiration.[93] Thus, the Act provided both a carrot and a stick to encourage innovation.

Changes in Administration of the Patent-Antitrust Interface

There were other Congressional and judicial decisions altering patent policy in the 1980s and 1990. Here we note briefly one other line of development -- the presumptions applied by the U.S. antitrust agencies when the exploitation of patent positions was alleged to conflict with antitrust prohibitions.

During the 1970s the Antitrust Division of the Department of Justice articulated a list of nine so-called "no-no's," most of which delineated what a patent holder could do in licensing other firms before running afoul of the antitrust laws.[94] The approach in effect asked whether restrictions written into patent licenses were necessary and whether less restrictive measures could have achieved the same objectives. Agreements to set minimum prices at which licensees could sell licensed products and to restrict licensing of third parties, mandatory package licensing, and requirements that the licensee buy unpatented products from the licensor (i.e., ties) were viewed with special skepticism.

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89. PhRMA, Pharmaceutical Industry Profile: 2003, p. 62.

90. One consequence is little recognized. By reducing the front-end testing costs incurred for generic entry, the Act's provisions not only encourage early generic competition, but make it possible for more generic firms to squeeze into a given market, intensifying price competition. The existence of Hatch-Waxman plus the large size of the U.S. market explains why U.S. generic drug prices tend to be the lowest in the world.

91. Many of the manipulations were found to be illegal. See Federal Trade Commission, Generic Drug Entry Prior to Patent Expiration: An FTC Study (July 2002); and "Generic Drugs: The Window Has Loopholes," New York Times, July 1, 2006, Business Section p. 1.

92. See Scherer, "The Link Between Gross Profitability and Pharmaceutical R&D Spending," supra note ---.

93. See the C-SPAN3 interview with Sidney Taurel, CEO of Eli Lilly Co., on May 8, 2006.

94. See Section of Antitrust Law, American Bar Association, The Federal Antitrust Guidelines for the Licensing of Intellectual Property, 2nd edition (Chicago: 2002), pp. 8-10. The document provides a comprehensive overview of the issues and reproduces Guidelines published by the antitrust agencies.

Partly because of Supreme Court decisions taking a more benign view of certain vertical restraints (such as exclusive franchising) and the installation of relatively pro-business Reagan appointees, a more tolerant view emerged on how patents and antitrust interacted. An early statement by an Antitrust Division official said that the nine no-no's "contain more error than accuracy" as statements of rational economic policy.[95] Five years later a deputy assistant attorney general criticized the "history of antagonism toward patent licensing" and urged that patent licensing could have numerous pro-competitive benefits.[96] On this he was clearly correct. Some deeper premises, however, were debatable. Ignoring the emerging literature on alternative first-mover advantages, he singled out patents as instruments for preventing free-riding on investments in technology, arguing that "patents create property rights without which technology would not exist -- or certainly not in its current abundance." As the work of Taylor and Silberston and Mansfield, already available at the time, made clear, this could be true for some new technologies, but by no means for all. The DoJ spokesman's further premise, therefore, is also questionable:

> Efforts to appropriate as much as possible of the surplus -- the social value in excess of marginal cost -- lying under the demand curve for the patented technology do not harm competition. Indeed, the potential for appropriating those rents is **the** engine [emphasis added] that drives the technology market.

In effect, the implication was that almost anything done unilaterally to increase an innovator's profits was beneficial for competition -- and given the way antitrust had come to be interpreted, beneficial for consumers. Such a view goes too far.

In 1995, after substantial interaction with the legal and scholarly communities, the Department of Justice and Federal Trade Commission jointly issued new **Guidelines for the Licensing of Intellectual Property**. In effect, the **Guidelines** stated that the antitrust agencies would analyze questionable patent - antitrust interactions on a "rule of reason" basis, asking whether a restraint "is reasonably necessary to achieve procompetitive benefits [e.g., superior or more extensive innovation] that outweigh ... anticompetitive effects." Given the complex repercussions of the practices addressed, a careful "rule of reason" approach seems eminently reasonable. One might hope, however, that antitrust agency staff charged with enforcing the guidelines and the courts interpreting them possess a broad understanding of what economic analysis -- on both the theoretical and empirical sides -- reveals about the limited and conflicting roles patents play.

Extension of U.S. Patent Standards to Other Nations

Undoubtedly more important than reforms in domestic patent law were U.S. efforts to influence the patent laws of other nations, and especially less-developed nations. Piracy of copyrighted music, motion pictures, and computer programs -- matters not addressed in this paper -- was one provocation.[97] On patents, a key problem was the fact that the Paris Convention governing inter-national patent relations, inaugurated in 1883, allowed member nations to determine the coverage of their patent laws, requiring mainly that they not discriminate between domestic and foreign patent applicants. Many nations had

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95. Remarks by Abbott B. Lipsky Jr. before the American Bar Association November 5, 1981, reproduced in CCH Trade Regulation Reports, para. 13,129.

96. Remarks by Charles F. Rule before the World Trade Association and the Cincinnati Patent Law Association, October 21, 1986, reproduced in CCH Trade Regulation Reporter, para. 13,131.

97. The term "piracy" was already used to denote cribbing of musical compositions in the 18th Century. See F. M. Scherer, Quarter Notes and Bank Notes: The Economics of Music Composition in the 18th and 19th Centuries (Princeton University Press: 2005), pp. 167 and 176.

patent systems providing much less protection for inventions than the United States did. Among 33 sizeable developing and high-income nations in 1990, for example, 14 offered no patent protection for pharmaceutical products, 15 none for food products, and 11 none for chemical products.[98] Eight of the 33, including Switzerland, home to three of the world's leading pharmaceutical companies, had joined the list of nations allowing patents for pharmaceutical products only between 1975 and 1989.

For pharmaceuticals, in which patents are accorded such importance, Italy was an early bete noire and focus of action. A patent law passed in 1939 and still applicable in the 1970s excluded pharmaceutical products from patentability. As a consequence, Italy became a world leader in producing and exporting generic pharmaceuticals to other nations -- before existing patents expired for the importing nations without product patent protection, otherwise as soon as national patent laws allowed. Among other things, during the late 1960s it was a major supplier of early "wonder drugs," broad-spectrum antibiotics, to the U.S. military purchasing authorities. This was stopped through an amendment to a foreign assistance bill, offered by a Congressman from Indianapolis on the floor of the House of Representatives in 1961 and passed by a vote of 87 to 65 (less than a quorum) after cursory debate.[99] A 1963 attempt to change the law, led by large Italian pharmaceutical companies, was blocked in the Italian Parliament owing to small-firm opposition.[100] During the 1970s, a group of multinational pharmaceutical companies from the U.S.A., Germany, Japan, and Switzerland, joined by some larger Italian firms, challenged the constitutionality of Italy's law. In March 1978, Italy's Corte Constitutionale found the exclusion of pharmaceutical products to be unconstitutional and ordered the prompt acceptance of drug patent applications. In the decade that followed, Italy's balance of trade in pharmaceuticals shifted from positive to negative.[101] India took Italy's place as the world's leading supplier of generic drugs to nations without product patents and, given its first-mover advantage, as an early generic supplier in the United States.

Beginning in the late 1970s a concerted effort began to bring the full array of laggard nations up to U.S. patent law standards. Among the prime movers were the U.S. pharmaceutical companies. Unlike the other legislative developments covered by this paper, the lobbying efforts that followed are richly documented.[102] Between 1981 and 1987, Edmund Pratt, CEO of Pfizer Inc., was chairman of the U.S. President's Advisory Committee on Trade and Negotiations (ACPTN). Its subcommittee on intellectual property was chaired by IBM CEO John Opel. In their role as advisors to the U.S. Trade Representative (USTR), coordinating international trade matters for the Executive Branch, and also in their communications with Congress, they pushed hard to bring patent and copyright issues to the forefront of U.S. trade dealings with other nations and international agencies. At the time USTR had, with one overburdened exception, virtually no independent economic analysis capability.[103] Pratt and Opel reached

98. Edson K. Kondo, "Patent Laws and Foreign Direct Investment: An Empirical Investigation," Ph.D. dissertation, Harvard University, May 1994, p. 62.

99. Congressional Record, August 18, 1961, pp. 16283-16285.

100. "Italian Sees Rise in Drug Research," New York Times, September 26, 1963, p. 47.

101. Sandy Weisburst, "Strengthening Patent Protection in Italy," senior thesis, Harvard University, March 1995. The results are summarized in Scherer, Patents: Economics, Policy, and Measurement (Edward Elgar: 2005), Chapter 6.

102. See especially Michael Santoro, "Pfizer: Global Protection of Intellectual Property," Harvard Business School case study 9-392-073 (1992); and Michael P. Ryan, Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property (Brookings: 1998). Much of what follows is drawn from those publications.

out to organize lobbying efforts by other industry groups such as the Pharmaceutical Manufacturers Association, the Business Roundtable, and a panoply of organizations seeking copyright protection.

These lobbying efforts led initially to the passage of two amendments to Section 301 of the U.S. International Trade Act, which defines unfair trade practices against which the United States might retaliate. The first, in 1984, authorized the U.S. government to impose unilateral sanctions against nations that failed to provide adequate intellectual property protection. Section 301 was strengthened into what was called "Special 301" in 1988, requiring the USTR to prepare an annual report identifying foreign nations with the most objectionable patent and copyright policies, placing them on a priority list, and commencing an investigation to determine whether the subject nations' "IP" policies merited retaliatory measures. The USTR proceeded cautiously, establishing in 1989 only a "priority watch list" that included Brazil, India, Mexico, the Peoples Republic of China, South Korea, Saudi Arabia, and Thailand. In May 1989 the United States levied 100 percent tariffs on $39 million of imports from Brazil as punishment for its deficient pharmaceutical patent policies. Threats were levied against Mexico, South Korea, China, and Thailand, among others. In 1991 the first actual priority list was issued, naming Thailand, India, and China as prime targets. Thailand's government had been dissolved in a no-confidence vote as a direct consequence of a patent bill introduced into the National Assembly in 1988 in response to early U.S. pressure.

The business advisors to the U.S. government and their industry allies also worked on a broader international front. Both directly and through U.S. representatives, they sought to have the Paris Convention modified to require uniformly high patent law standards for member nations. Efforts to reach this goal through the World Intellectual Property Organisation (WIPO), a branch of the United Nations, and at the Nairobi round of Paris Convention negotiations were a failure. Efforts with WIPO were "a disaster," a Pfizer executive said, because "WIPO works by majority, and simply put, there were more of them than us."[104] Nairobi Round efforts during the late 1970s failed because United States, European, and Japanese delegates were unable to agree on a united front.[105] Absorbing the lessons from these failures, Pratt and Opel organized a combined lobbying effort by U.S. patent- and copyright-sensitive industries, who in turn recruited their counterparts in Europe, e.g., the Dolder Group of pharmaceutical companies,[106] and the Keidanren in Japan. All put pressure on their governments to make stronger intellectual property rights a priority issue in international trade deliberations.

The opportunity arose with the start of a new round of international trade policy negotiations -- the Uruguay Round -- in September 1986. The United States component of the effort was organized through

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103. During the 1980s the author made presentations to USTR representatives on the first two rounds of the softwood lumber dispute between the United States and Canada. Even though several USTR officials were wearing neckties bearing the likeness of Adam Smith, as was the fashion during the Reagan Administration, they had no understanding of Smith's theory of spatial rent, which lay at the heart of the dispute.

104. Santoro, p. 7, quoting Lou Clemente, Pfizer general counsel and chair of the intellectual property committee of the U.S. Council for International Business.

105. See Fenton Hay, "Canada's Role in International Negotiation Concerning the Patent Laws," in John Palmer, ed., Research in Law and Economics, vol. 8 (1986), pp. 239-263.

106. So-called because their chief executives met each year at the Dolder Grand Hotel in Zürich.

an "Intellectual Property Committee" comprising the chief executives of 13 major companies.[107] Working with their counterparts from Europe and Japan, the IPC members distributed in June 1988 a 100-page "Basic Framework" setting goals for the inclusion of intellectual property issues in whatever treaty resulted from Uruguay Round negotiations. A key to the agreed-upon strategy was "linkage." Most less-developed nations opposed their inclusion, but United States negotiators, supported inter alia by individuals seconded to their team from the Patent and Trademark Office, made it clear that the United States would not ratify any treaty unless it included IP standards, and there would be no cherry-picking -- all provisions had to be accepted by a ratifying nation. If less-developed nations were eventually to secure relief from the Multi-Fibre Agreement, which limited the textile exports on which they had comparative advantage, and developed-nation barriers to agricultural product imports, they would have to go along with the intellectual property provisions. And perhaps even more important, having intellectual property questions covered by the ratified Uruguay Round Treaty removed most possibilities that the United States could brandish its Section 301 sword unilaterally. Tough bargaining yielded a compromise draft of what came to be called the "TRIPS" (Trade-Related Aspects of Intellectual Property Rights) agreement, which was included in the final draft treaty compiled by the GAAT Secretary-General and in the ultimate treaty that replaced GAAT with the World Trade Organization.

U.S. advocates of TRIPS argued inter alia that less-developed nations should welcome strengthened patent laws because they would encourage domestic innovation, which among other things flourished in the early history of the United States, and because it would induce more inward technology transfer through foreign direct investment by multinational enterprises. There is an element of paradox in this argument, since most less-developed nations with weak patent policies were opposed to the changes, which suggests that the LDCs did not know what was good for them. The argument also overlooks the fact that during the first 47 years of its existence, the United States provided strong patent protection to domestic residents, but denied patents to foreigners, whereas LDCs were being asked under TRIPS to increase the scope of their patent protection to both domestics and foreigners. Economic theory provided at best ambiguous guidance on the alleged benefits to poor nations of strong and open patent systems.[108] Some econometric studies suggested that strong patent systems encouraged inward foreign direct investment, but the most positive early findings were based on subjective measures of patent system strength that could have reflected the evaluators' broader views on the desirability of nations for investing, and the only early study using more objective measures reported negative or inclusive results.[109]

The opposition of LDC negotiators to uniform U.S.-grade patent protection led to compromises in the TRIPS version ultimately accepted. For one, full implementation of TRIPS by nations categorized as

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107. Pharmaceutical makers Pfizer, Merck, du Pont, Bristol-Myers, and Johnson & Johnson, plus General Electric, Warner Communications, Hewlett-Packard, FMC Corporation, General Motors, and Rockwell International.

108. See e.g. Alan Deardorff, "Should Patent Protection Be Extended to All Developing Countries?" The World Economy, vol. 13 (December 1990), pp. 497-507, and "Welfare Effects of Global Patent Protection," Economica, vol. 59 (February 1992), pp. 35-51; and F. M. Scherer, "A Note on Global Welfare in Pharmaceutical Patenting," The World Economy, vol. 27 (July 2004), pp. 1127-1142.

109. Compare Richard Rapp and R. Rozek, "Benefits and Costs of Intellectual Property Protection in Developing Countries," Journal of World Trade, vol. 24 (October 1990), pp. 75-102; and Jeon-Yeon Lee and Edwin Mansfield, "Intellectual Property Protection and U.S. Foreign Direct Investment," Review of Economics and Statistics, vol. 78 (May 1996), pp. 181-186; with Edson Kondo, "The Effect of Patent Protection on Foreign Direct Investment," Journal of World Trade, vol. 29 (December 1995), pp. 97-122, along with note --- supra. See also Keith E. Maskus, Intellectual Property Rights in the Global Economy (Institute for International Economics: 2000), Chapter 5.

least-developed could be delayed until 2005. Provision was made in Article 40 for non-exclusive compulsory licensing of patents in cases of monopolistic abuse and also, in Article 31:

> [Such] use may ... be permitted if, prior to such use, the proposed user has made efforts to obtain authorization from the rights holder on reasonable commercial terms and conditions and that such efforts have not been successful within a reasonable period of time. This requirement may be waived by a Member in case of a national emergency or other circumstances of extreme urgency or in cases of public noncommercial use.

Curiously, most references to this provision in the U.S. press have stressed the "national emergency" part and ignored the language allowing compulsory licenses when negotiations have failed to converge on "reasonable commercial terms." How that misconception was propagated is unclear.

Article 31, subparagraph (f), also stipulated that compulsory licenses be authorized "predominantly for the supply of the domestic market of the Member authorizing such use." For most of the world's least-developed nations, this provision posed a special difficulty in such areas as pharmaceuticals, since those nations typically had neither the technical capabilities nor sufficient demand to support efficient domestic drug production under license. The problem was singled out as critical at the start of the Doha Round of trade negotiations in 2002, and in 2003, agreement was reached on amendments allowing waivers from subparagraph (f) for least-developed nations and for other nations showing that they lack the capacity to manufacturing particular pharmaceutical products.[110]

To the best of the author's knowledge, the compulsory licensing provisions of the TRIPS agreement have been implemented sparingly, if at all. But their use has been threatened frequently to induce, especially from multinational pharmaceutical companies, substantial product price concessions or, e.g. in Brazil, voluntary licensing to domestic suppliers at modest royalties. Indeed, even the United States threatened compulsory licensing in 2001 to elicit substantial price reductions from Bayer AG of Germany on the drug Cipro when terrorist activity threatened an epidemic of otherwise untreatable anthrax.

6. Propaganda

In many contemporary discussions of patent policy, and even in this paper, the term "intellectual property" trips off the tongue as if it were implanted in the human brain's genetically inherited grammar. It is certainly a magical phrase. "Patents" and "copyrights" are words with little or no appeal to the moral sensibilities. But "intellectual property!" What right-thinking person could be against property? And who among the scribbling professions could not be all the more entranced when the property is intellectual?

What strikes a scholar who has been studying patent questions for more than a half century is that the phrase "intellectual property" was almost never heard during the 1950s and 1960s. None of the O'Mahoney Committee's 28 commissioned titles exploring the history, implementation, and economic consequences of the patent system during the late 1950s contains the term. A search of the two most comprehensively bibliographic of the O'Mahoney Committee studies and a later Joint Economic Committee study reveals very few titles, mostly ancient, using the term.[111] It repays effort therefore to investigate how the phrase achieved common currency.

110. WTO document IP/C/W/405, 28 August 2003.

111. Fritz Machlup, An Economic Review of the Patent System, Study no. 15 of the Subcommittee on Patents, Trademarks, and Copyrights, Senate Committee on the Judiciary (1958); Julius W. Allen, Economic Aspects of Patents and the American Patent System -- A Bibliography, Study No. 14 of the committee; and S. C. Gilfillan, Invention and the Patent System, Joint Economic Committee of the U.S. Congress (1964).

At first, "property" appears to have entered the literature without its "intellectual" modifier. Patent-like privileges were given out by sovereigns in the period of late feudalism, and in the revolutions against feudalism and royal fiat, some acceptable substitute for "privilege" had to be invented. The U.S. Constitution referred to "exclusive rights," but in Europe at the end of the 18th Century, it was de rigeur to refer to a creator's rights in inventions and artistic creations as "property." The usage was not without controversy. In their survey of French antecedents, Machlup and Penrose observe that "those who started using the word property in connection with invention had a very definite purpose in mind: they wanted to substitute a word with a respectable connotation, 'property,' for a word that had an unpleasant ring, 'privilege.' This was a very deliberate choice on the part of politicians working for the adoption of a patent law in the French Constitutional Assembly."[112] Their construction was rejected by America's first federal patent examiner, Thomas Jefferson, who wrote flatly that "Inventions cannot in nature be a subject of property."[113] Nevertheless, the property concept proved to be durable, and the first world-wide patent treaty, in 1883, was called the Paris Convention for the Protection of Industrial Property.

"Intellectual" was added to "property" much later. The earliest known printed use of the term is in an obscure Massachusetts circuit court ruling.[114] It appears four times in French and German works from the 1860s cited in Machlup's bibliography, mostly addressed to the attack on patent systems being waged in Europe at the time.[115] Its next recorded appearance in American literature titles, gleaned from a search of three research library catalogs, was in a collection of essays by N.S. Shale in 1878.[116] It them reappears, according to the compendium by Julius Allen,[117] in the titles of three articles published between 1944 and 1952 in the house organ of the U.S. Patent Office, **The Journal of the Patent Office Society.** A published lecture by Sir Arnold Plant titled **The New Commerce in Ideas and Intellectual Property** followed in 1953.[118]

The phrase's takeoff into widespread use may have been associated with the creation of the Geneva-based World Intellectual Property Association (WIPO) in 1966 and its predecessor, United International Bureaux for the Protection of Intellectual Property, founded in 1963. Few intervening references could be found in bibliographies and library catalogs. A seminal role in establishing those organizations was played by Arpad Bogsch, who before their formation was a legal counselor at the U.S. Copyright Office. Obituaries at the time of his death in 2004 called him "the founding father of modern

112. Fritz Machlup and Edith Penrose, "The Patent Controversy in the Nineteenth Century," Journal of Economic History, vol. 10 (May 1950), p. 16. See also Machlup, An Economic Review, p. 22.

113. John P. Foley, ed., The Jefferson Cyclopedia (Funk & Wagnalls: 1900), p. 728 (letter to Isaac McPherson in 1813). A consistent but more extended discussion is found in what appears to have been an earlier letter to McPherson reproduced at p. 433.

114. Davoll et al. v. Brown, cited in Woodury & Minot, CCD Mass. 7 F. Cas. 197 (1845).

115. Machlup, An Economic Review, pp. 85-86 (cited works by Molinari, Paillotet, Rentzsch, and Vermeire). The University of Pennsylvania library catalog lists an additional 1859 book by Frederic Passy.

116. Thoughts on the Nature of Intellectual Property and Its Importance to the State (Osgood: 1878).

117. Economic Aspects of Patents, supra note --, at pp. 15 and 29.

118. Plant's earlier and more famous work, "The Economic Theory Concerning Patents for Inventions," Economica, new series (February 1934), pp. 30-51, does not use the phrase. It contains a remarkably prescient view of first mover advantages as a substitute for patenting.

intellectual property" and "the creator of the modern intellectual property system."[119] None of the six books, all on copyright, written by Bogsch before 1966 and listed in the Harvard University catalog included the words "intellectual property" in their title, but he appears to have been an important contributor to their acceptance in popular discourse.

Other organizations followed suit during the period when the U.S. patent policy reform movement was at its peak. The American Patent Law Association changed its name to American Intellectual Property Law Association and made a corresponding change in the name of its journal (now **AIPLA Quarterly Journal) in** 1983 or 1984. The relevant section of the American Bar Association was still named the Section of Patent, Trademark & Copyright Law in 1987, but it then changed its name to Section on Intellectual Property Law and in 1993 renamed its quarterly newsletter the **IPL Newsletter** in place of **PTC[120] Newsletter**. It sponsored a conference on "Industrial and Intellectual Property: The Antitrust Interface," in October 1984. The **Intellectual Property Journal** was initiated in 1984. During the early 1980s the office of the U.S. President's Special Trade Representative created a new position, Assistant USTR for International Investment and Intellectual Property.[121] The industry lobbying group formed in 1986 to influence deliberations under the Uruguay Round was called the Intellectual Property Committee. In 1989 a revived subcommittee of the U.S. House of Representatives Committee on the Judiciary was named the Subcommittee on Courts, Intellectual Property, and the Administration of Justice. In 1994 the U.S. Senate still had a Subcommittee on Patents, Copyrights, and Trademarks. It was dissolved in 1995 and reborn in 2005 as the Intellectual Property Subcommittee.

Semantics are not policy. But they undoubtedly influence policy-making as well as being influenced by it. The growing use of the term "intellectual property" to describe patent and trademark matters probably contributed to the emergence of a favorable mind set that in turn set the stage for the patent policy reforms of the 1980s.

7. Conclusion

U.S. patent policy was altered in significant ways during the 1970s and 1980s through legislatative, administrative, and judicial actions. Some of the legislative changes were well-grounded in objective analyses of the problems at hand and what could be accomplished; others, and in particular the centralization of patent appeals in a Court of Appeals for the Federal Circuit, were not. In most cases, the parties with the strongest vested interest in new legislation got what they wanted -- most generally, with the exception of the generic drug provisions of the Hatch-Waxman Act, a strengthening of the role patents play in American industrial life. The patent law profession in particular thrived. But the changes brought negative consequences along with the positive. In particular, by encouraging the proliferation of patents covering inventions of dubious novelty and increasing the statistical probability that knowing or inadvertent infringement of patents leads to dire consequences, it increased the risks as well as the rewards from inventive activity. It is far from clear that the positive effects outweigh the the negatives. Fortunately, as economic studies have shown repeatedly, patents do not play a particularly important role in most fields of industrial innovation, and equally fortunately, those who advise industrial leaders in their journeys through the patent minefield are adept at negotiating solutions that in most instances avoid serious impediments to the pace of technological progress. It is nevertheless useful to assess the negatives and

119. Obituaries published on the worldwide web by the International Association for the Protection of Intellectual Property and the International Confederation of Societies of Authors and Composers. See also Ryan, Knowledge Diplomacy, p. 126.

120. I.e., Patent, Trademark, and Copyright.

121. Santoro, p. 9.

attempt to correct them through legislative or judicial action. In this, we would be emulating the example of one of the world's most famous inventors, James Watt, who observed "I have been trying experiments on the reciprocating engine, and have made some alterations for the better and some for the worse, which latter must return to their former form."[122]

The world patent policy environment experienced even more dramatic change. The harmonization demanded by first-world pharmaceutical makers and media-oriented enterprises was advanced significantly with the inclusion of TRIPS provisions in the Uruguay Round Treaty. Third-world nations were arguably disadvantaged by the changes, or at least, most considered themselves to be, but they accepted the bargain in the hope of better export prospects in agriculture and textiles and to ward off punitive measures under U.S. Trade Act Section 301. Because the textile and especially agricultural changes have at best been slow in coming,[123] it would not be improper to suggest that the third-world nations were led into a Faustian bargain. In Europe, on the other hand, competition policy authorities have become noticeably more aggressive, among other things requiring what amounts to the compulsory licensing of Microsoft's server-desktop communication protocol specifications and other proprietary information at royalty rates kept reasonable through Commission supervision.

We conclude by itemizing briefly some of the most important possibilities for improved policies, among other things guiding the European Community in its continuing efforts to establish a community-wide patent code. Their merits have been debated at length elsewhere,[124] so they will be presented here as mere recommendations with minimal accompanying analysis:

1) To purge the landscape of spurious and invalid patents that lead mainly to blackmail and/or costly litigation, a system of third-party opposition should be inaugurated in the United States. It would be similar to the opposition systems enforced in many Western European nations. Filing of an opposition by an interested party could commence at the time patent applications are first published, e.g., 18 months after application, rather than waiting until patents have issued.

2) So-called "patent trolls" -- i.e., entrepreneurs who acquire patents merely to use them as instruments of blackmail rather than developing the underlying inventions and introducing them commercially -- should never be allowed to obtain injunctions against others who are actually developing the subject matter and utilizing it commercially. Rather, if the subject patents are shown to be valid and infringed, the non-commercializing patent holders should be limited to recovering reasonable royalties. Ideally, the royalties would be set by arbitration rather than being subject to the caprices of a jury decision.

122. Letter of James Watt to Dr. William Small, January 28, 1769, reproduced J.P. Muirhead, The Origin and Progress of the Mechanical Inventions of James Watt (London: 1854).

123. See "Poor Nations Are Still Waiting for U.S.-European Trade Accord," New York Times, July 4, 2006, p. C3.

124. See in particular Jaffe and Lerner, Innovation and Its Discontents, supra note ---; United Kingdom Commission on Intellectual Property Rights, Integrating Intellectual Property Rights and Development Policy (London: September 2002); U.S. Federal Trade Commission, To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy (Washington: October 2003); and U.S. National Research Council, A Patent System for the 21st Century (Washington: National Academies Press, 2004).

3) In other cases, when acceptable substitutes for an infringed product or process exist, and given the great difficulty of estimating damages under a "lost profits" standard, damages should be limited to reasonable royalties.

4) Companies that acquire dominant patent positions in meaningful markets through the acquisition of patents from inventors whose R&D they did not support financially should be consisdered to have monopolized in the antitrust sense and subjected to compulsory licensing remedies, unless they can show that the persons from whom they acquired the patents could not have commercialized the inventions independently.

5) Inventions resulting from research efforts supported in substantial measure by government funds should continue to be licensed for commercialization to private parties, as authorized under the Bayh-Dole and Stevenson-Wydler Acts. However, when such licenses are exclusive, as they may need to be to encourage commercialization, but when the resulting products are priced at levels out of all proportion to the costs and risks undertaken by the commercializing enterprise, the march-in rights embodied in those Acts should excercised. A rule of reason should be applied in judging both the necessity of remedies and their extent. Since this is difficult, the U.S. federal government should create a commission whose task is to determine and recommend remedies sufficient to correct abuses of government-supported patents.

6) Clarification from either the U.S. Supreme Court or Congress is needed on a matter the Supreme Court elected not to hear on appeal after the government antitrust agencies filed conflicting briefs.[125] A decision by the Court of Appeals for the Federal Circuit permitted a patent holder to pay $60 million to a would-be generic competitor to delay generic entry into a prescription drug market when, under the Hatch-Waxman Act, the generic firm could have entered following expiration of the period when entry had to be delayed because of a patent dispute.

7) The Court of Appeals for the Federal Circuit is a fait accompli unlikely to be eliminated. However, the Supreme Court should be diligent in accepting certiorari on its decisions and reversing those that operate to the detriment of balanced technological progress. The U.S. President should take seriously the will of Congress that "a broad range of qualified individuals" be appointed to the Court, nominating relatively fewer individuals who have made their living through the practice of patent law and nominating instead individuals with professional backgrounds in technological research and the economics of technological innovation.

8) The so-called "research exemption" whose status in U.S. law has been questioned should be affirmed. That is, patents should not enforceable to block the application of a technology purely for purposes of research and development, especially when the research is done by not-for-profit organizations. Only when such research has progressed to the point at which products or products are commercized should patent protection have exclusionary power or be used to levy tolls on the advance of technology.

9) Some of the impediments to economic development and health care programs in less-developed nations as a result of the Uruguay Round Treaty have been alleviated by provisions delaying implementation of patent law changes for the least-developed nations

125. F.T.C. v. Schering-Plough et al., certiori denied June 26, 2006.

until 2016, by the compulsory licensing provisions of the TRIPS agreement, and by the Doha-Cancun interpretation allowing compulsory licensing for importation of e.g. pharmaceuticals by nations unable to produce under compulsory license for their own use. The developed nations, however, should cease their opposition to full utilization of these exceptions and recognize that compulsory licensing is a fully acceptable measure under appropriate conditions.

10) A skeptical view should be taken by the U.S. Congress and the parliaments of other nations toward the patentability of business methods, computer programs, natural processes that operate within the human body, surgical methods, and human DNA sequences and the proteins they express. To the extent that the development and commercialization of medicines, vaccines, and therapeutic methods comes into conflict with such patents and also with patents on research tools, injunctive remedies should be unavailable. When voluntary agreement on licenses or cross-licenses at mutually acceptable royalties cannot be reached, stalemates should be eliminated by determining reasonable royalties through arbitration.

SUMMARY OF DISCUSSION

Competition Committee Chairman Frédéric Jenny opened the discussion by noting that this roundtable had solicited a very strong response with 16 contributions as well as considerable outside academic interest. As a result, the discussion would be wider in scope than usual and would focus less on enforcement issues. The roundtable would address two main themes: the relationship between competition and innovation and the relationship between intellectual property rights and innovation.

The Chairman welcomed the panel of experts:

- Professor F.M. Scherer, Harvard University
- Professor Bronwyn Hall, Universities of Maastricht and California at Berkeley
- Dr. Dominique Guellec, OECD Directorate for Science and Technology; former Chief Economist of the European Patent Office
- Paul Lugard, Head of Antitrust at Philips International
- Louis Lupin, General Counsel at Qualcomm
- David Simon, Chief Patent Counsel at Intel
- Dr. Nicholaus Thumm, Swiss Federal Institute of Intellectual Property

1. Competition and Innovation

Professor Scherer provided a general introduction to the topic, observing first that there is a basic dualism in the relationships between the degree of competition and incentives for technological innovation. Rivalry accelerates the pace of technological progress both through a behavioural stimulus and by ensuring that a diversity of technological approaches is explored. But too much rivalry dries up the pool of rents achievable through innovation and hence discourages it. This insight led to the inverted-U theory first advanced in the 1960's. In this theory, middling levels of concentration are conducive to the fastest rate of technological progress. Scientific and technological progress on the one hand, and the growth of demand on the other, interact in what can be called a Marshallian "scissors" to make innovation profitable. According to discounted present value, at some point in time, for instance, 6 years, it becomes profitable for the first time to innovate, as the profits that can be extracted exceed the research and introduction costs.

At that point only a secure monopolist or a firm with security that it will achieve a monopoly can in fact profitably innovate. However, a secure monopolist will delay its innovation until costs fall further so as to maximise the difference between the discounted present value of innovation costs on the one hand and the discounted present value of rewards on the other hand.

A market that is contestable rather than secure can force innovation to occur earlier. This competition for the market which pushes the innovation date ahead in time is known as Schumpeter's creative destruction. A more sophisticated view of the same phenomenon distinguishes technology push inducements, which stimulate innovation even in the presence of a secure monopolist, thereby shortening the time for new technology. This occurs typically where the discounted present value of R&D costs falls

precipitously because of a new, generally external, scientific or technological advance, opening a large gap between costs and pay-offs. This may also occur on the demand pull side, where demand suddenly rises, for example, because of an energy shock that makes the innovation of energy saving devices much more profitable. In these situations, there is a gap immediately between possible pay-offs on the one hand and the costs of innovation on the other hand, making it possible for not just a secure monopolist but for several firms competitively to explore the new technology, bringing the innovation date closer to the zero point. A monopolist will, however, still try to delay even in these situations.

Another impairment to the speed of innovation in the case of secure monopolists is that the monopolist is apprehensive about cannibalising its own existing profits. It will, in these instances, delay as long as it is not threatened by external competition. Outside rivals, in contrast, will see the whole pre-innovation surplus, plus the enhancement due to the superiority of the innovation as their potential gains, if they can leap ahead of the incumbent monopolist. Confronted with this kind of competition, an incumbent monopolist may try to ward off the loss of its profits by engaging in what is called 'a fast second strategy', accelerating its own R&D and taking other measures to try to secure its profits.

A psychological variant of this phenomenon is dealt with in Clayton M. Christensen's best selling book "The Innovator's Dilemma". Christensen argues that the incumbent firms pay attention most to the improvements desired by existing customers and tend to ignore so-called disruptive innovations. The policy implication is that it is important for the maximum rate of technological progress to keep market entry open, so that outsiders can threaten and, if the incumbent does not react, take over the relevant market.

Professor Scherer then referred to several case studies beginning with Intel. When Intel was all alone in the 32 bit microprocessor field it had a relatively gentle speed of improvement curve. But when AMD and Syrex began challenging Intel in this field, the speed at which microprocessors were improved accelerated and Intel brought out far more innovations than it did during the period without competition. Here again, rivalry accelerated innovation in a near monopoly situation.

Other case studies referred to by Professor Scherer are contained in a paper written for the American Bar Association entitled "Technological Innovation and Monopolisation' which is forthcoming in a volume of essays. It deals with seven great American high technology monopolisation cases.

Professor Scherer last mentioned the Xerox case in which fifteen years after the initial discovery of the Xerox 914 copier, it still had more than 90% of the market with extensive patent protection. The Federal Trade Commission negotiated a compulsory licensing decree with Xerox which clearly stimulated R&D and had beneficial effects for consumers.

Professor Scherer submitted that based on his work and the book 'Patents and the Corporation', compulsory licensing has had little negative effect on R&D incentives. In general, companies found non patent first mover advantages plus the threat of Schumpeterian creative destruction much more important in their R&D decisions than the expectation of patent protection. This notion has been confirmed in major studies by Silberstein and Taylor, Mansfield, Richard Levin et al, Wesley Cohen et al, in a variety of much larger scale studies.

The Chairman noted that the introduction outlined the complexity of the innovation process and the fact that in order to have any idea of how innovation is going to develop in a particular sector, not only structural but also strategic variables must be taken into account.

1.1 What is the motivation for innovation by companies?

The Chairman then turned to the contribution from Turkey which points to the diversity of situations and the goals of firms when they innovate in different types of sectors.

A delegate from Turkey reviewed the cases examined by the Turkish competition authority. It appears that companies have different reasons to conduct R&D activities in order to create more innovation. Firstly, in markets such as that for information and communications technology, competition is based on the continuous introduction of new products. Companies innovate to survive and keep their existing position as the technology develops and improves very quickly. The delegate referred to Schumpeter in terms of destructive creation as firms lagging behind are driven out of the market. Secondly, in the GSM market, in addition to the existence of network externality, the incumbent operator is motivated to innovate in order to keep its market position whereas the other two companies are basically innovating to survive in the market. Thirdly, in some so-called mature markets, such as spirits and cigarettes, the main motivation for innovation is to maintain market position, due to the restrictions on advertising.

As for the pharmaceutical industry, primarily the branded product manufacturers conduct R&D and introduce new products. In some cases, the motivation for introducing a new drug on existing markets is to protect market position. However, when a pharmaceutical company introduces a new product for an uncured illness its main motivation is to obtain a first mover advantage in this market. Lastly, in the cement market companies have no incentive to innovate, due to their practice of colluding on prices. Despite the fact that they could introduce new products with better quality and at cheaper prices, they refrain from doing so because they prefer to collude.

The Chairman noted the complexity of the problem depending on whether markets were contestable, rate of knowledge advancement and shifts in industry costs. The nature of the product and its level of differentiation make a difference. This issue is relevant particularly to merger control because it often requires predicting what might happen in terms of innovation.

Professor Scherer noted that the situation of Turkish firms is not unlike that of Japanese firms in the 50's and 60's as described in a brilliant book by Daniel Okimoto 'Between MITI and the Market'. Japanese firms relative to the world economy were tiny in those days, but in what really mattered for their innovation they were very much like the small US firms, as patent protection could be quite important to provide that extra margin of security to defend against rapid imitation and the erosion of profits. This is, of course, a double-edged sword as patents can also be used by large firms to protect their markets from small start-ups.

1.2 Does dominance promote innovation or stifle it?

Paul Lugard then took the floor on the specific subtopic of the relationship between dominance and innovation and on the importance of having a framework of analysis for exclusionary conduct engaged in by dominant firms that might threaten innovation but which also balances static and dynamic gains.

Lugard first commented on the idea that the most important policy recommendation is that barriers to entry should be low. Economic literature tells us that the optimum rate of innovation is not necessarily achieved if there is fierce competition. Professor Scherer just mentioned the inverted-U relationship between competition and innovation which, although it has been partly discredited, nonetheless indicates that in many cases less than absolute competition might produce more innovation. Equally, it seems that monopolistic situations produce less innovation. If that is true then stimulating price competition might not be the best approach in all circumstances. For instance, the market for consumer electronics is

characterised by heavy price erosion as prices decrease very rapidly, with shorter life cycles over time. As price competition is fierce, it is very difficult to innovate. As a result, introducing more price competition in this already very competitive market may not bring about innovation.

As for the relationship between intellectual property and competition law, it is well established that both bodies of law seek to achieve economic efficiency and consumer welfare. Although it could be argued that IP law is more geared towards dynamic efficiencies and that perhaps competition law is a little bit more focused on static gains, the distinction is far from clear cut. Lugard submitted that the competition agencies should be extremely reluctant to intervene against the exploitation of IPRs. There are two areas which are of specific concern, the first one is compulsory licensing, which in Lugard's view should be mandated only in the most exceptional set of circumstances, simply because it may defeat innovation. In Europe, this might require a clarification of the *IMS* criteria and reflection upon the present wording of the Article 82 discussion paper.

In Lugard's view, the competition agencies should also be very reluctant to estimate the value of technology and to assess, for example, the royalty rates that holders of IPRs would be allowed to apply. IP licensing is simply a knowledge input into a final product and guessing the precise value of that knowledge is too risky from an innovation point of view. Nonetheless, there are cases where IPRs can be abused and in which the agencies should intervene, for example, in the context of standard setting activities where companies may hold back their patents such as in a Rambus situation. A second case the agencies should examine is the imposition of excessive non-assert and pass-through obligations on licensees by IPR holders. These clauses force the licensees to surrender their IPRs to the licensor, thereby depriving those licensees of ways to exploit their rights.

As for the question of how to assess restraints on innovation and competition by dominant firms, there is no consensus about the proper framework and methodology to identify exclusionary behaviour by dominant firms. This is especially the case if the conduct produces both positive and negative effects, and when there are dynamic effects involved. Lugard offered three suggestions on the elaboration of a framework of analysis:

- Because it is so difficult to identify upfront whether conduct restricts innovation and therefore competition, ex ante intervention is especially risky. Ex post intervention, where the agencies can evaluate past market outcomes, is to be favoured over ex ante intervention.

- Negative effects on innovation are only likely to occur if the company is indeed dominant for a durable period of time. There is a need to improve upon the analysis of significant market power and dominance and to bring together diverging approaches among jurisdictions. Considerable work undertaken by this group will hopefully continue over time especially in relation to barriers to entry and the assessment of significant market power.

- Intervention is only justified if there is a clear theory of harm. There must be an assessment of the possibilities and the financial incentives to exclude companies and hamper innovation in line with the EAGCP report of July 2005 commissioned by the European Competition Directorate General in the framework Article 82 discussions.

The most difficult question is what standard – if any – is most likely to properly identify anti-competitive conduct. Of the many competing tests used currently, the no economic sense test and the consumer surplus test attract most attention. The objective of the latter test is to optimize long term consumer surplus. Nonetheless, it is not clear that this test properly distinguishes good and bad conduct as it may be over inclusive with respect to efficient behaviour. This test is also difficult to apply in practice as

it requires some quantification of positive and negative effects over time which is particularly difficult if dynamic efficiencies are claimed.

Lugard questioned the necessity of the consumer surplus test pointing out that in many important innovation related cases it was fairly obvious that the dominant company abused its position and that innovation was restricted. In consequence, one can wonder if the no economic sense test, which is easier to apply, would not properly define and identify those cases which are bad for innovation.

The Chairman noted that there has been a series of provocative statements starting with Professor Scherer's comment on compulsory licensing. Mr. Lugard then intimated that price competition could stand in the way of innovation, or at least that competition authorities should be more aware of this based on the inverted-U shape relationship.

A delegate from Italy emphasized that competition is multidimensional. Price is an important element when products share the same characteristics. When products differ, price is just one element, although in practice it is very difficult to distinguish price and non-price competition. Competition in differentiated product markets is mainly a non-price issue which can become a price issue. In general, it is the new entrant that breaks up markets and monopoly positions. Competition authorities don't have a fixation on price competition but rather a fixation on competition in general.

Lugard clarified that his point was that additional price competition may not further innovation in certain markets. If it's true that innovation creates the largest gains for society and if it's also true that most innovation is generated in a market structure that is not perfectly competitive and where markets may even be oligopolistic, then the observation that additional price competition does not improve the result is an important one.

The Chairman then introduced the empirical research undertaken by the Competition Policy Research Centre of the Japanese Fair Trade Commission on whether there is relationship between competition, innovation and productivity.

A delegate from Japan stated that the purpose of the research was to undertake an empirical study using data on Japanese firms to see whether market competition promotes dynamic efficiency or economic growth through innovation. The study found a negative relationship between market competition measured by HHI[1] and innovation represented by R&D spending or number of patents held. Thus it supports the so-called Schumpeter theory. However, this study also found that when the data was divided into two groups based upon the level of market competition, the relationship between market competition and innovation in terms of R&D spending becomes positive for more competitive markets, while it is still negative for less competitive markets. This part of the study shows a result which is quite opposite to the traditional inverted-U-shaped theory. The delegate pointed out, however, that there is one weakness in these findings; they are not statistically significant.

The study concluded that in many cases the relationship between competition and innovation is complex and cautioned that there is much room for improving the econometric models. Since this is virtually the first empirical study conducted by the Centre and considering that the findings are mixed, the delegate indicated that this study by itself cannot have significant policy implications at this time. Further empirical research focusing on Japanese data could be instrumental for the JFTC in terms of enforcement activities and in seeking to strike the right balance between patent protection and prevention of abusive conduct.

[1] Herfindaht Hirschmann Index.

The Chairman noted there is obviously a great interest in understanding better the relationship between competition and innovation as well as the national environment of this relationship. The Chairman then questioned how these studies can be used by the competition authorities in regular enforcement activities and noted that the British contribution is very interesting in this respect. The UK's contribution states that since this issue was first examined years ago, economic thinking has changed in at least two areas: (i) the type of innovation makes a difference with a distinction between leap-frogging and step-by-step innovation; and (ii) evidence supports the inverted-U relationship between product market competition and innovation.

The Chairman then turned to the UK delegation to expand on this and to comment on two mergers that are referred to in the contribution: the Bio-Rad Microscience/Carl Zeiss case and the Landis and Gyr/ Bayard case. The Chairman questioned whether the change in the concepts about the relationship between competition and innovation played a role in the determination to clear those mergers, which involved high concentration levels.

A delegate from the UK first responded to the broad question of how these studies can be helpful. The studies suggest that the agency needs to look much more carefully at cases on an individual basis rather than trying to define generally applicable principles, which is why the agency has not attempted to introduce IP guidelines.

Before addressing the two merger cases, the delegate discussed a monopoly case concerning video games. A new market emerged very rapidly in the early 90's for hand held video games. There appeared to be a duopoly between two Japanese suppliers, Nintendo and Sega. There was concern these suppliers were exercising IPRs to control access to supply games for those machines as well as the pricing of their products. There was one new entrant who was just coming into the market in a very small way. Although the industry was clearly going through a period of very rapid technological change, the competition authority recommended compulsory licensing. One supplier concerned exited the market rapidly losing market share. The new entrant, Sony, raised its market share from virtually 0 to over 50% in about 5 years and a further new entrant, Microsoft with its Xbox product, rapidly built a significant market share. In consequence, the delegate argued that this is a case where the authorities should not have intervened, but rather should have seen the rate of technological innovation and left the market to find its own solution.

Moving on to the merger cases referred to by the Chairman, the delegate indicated that these new studies have led the UK authorities to analyse much more carefully the markets concerned and the rate of technological change. The Landis and Gyr / Bayard case involved electricity meters. Although there were four competitors each with its own system, there was a high rate of innovation leading to competing technologies. As a result, it was likely that even in the face of a significant merger, market share would not bring about market power and innovation would continue, leading to a clearance in Phase 1. The case involving microscopes, Bio-Rad and Carl Zeiss, was more difficult. Although there seemed to be strong arguments that innovation would not be stunted as a result of the merger, it was nevertheless important to carry out a further investigation. The Competition Commission concluded that the company being taken over by Bio-Rad was going to exit the market in any event and there were still plenty of incentives to innovate between the two remaining suppliers.

The Chairman opened the floor to questions on the presentations made so far.

A delegate for the European Commission asked Professor Scherer and the panel to comment on three issues in view of the importance of the relationship between competition and innovation to antitrust policies. Considering the complexities brought to light by the Japanese and UK contributions, certain clarifications of terms may be helpful:

- With respect to the relationship between innovation and price competition, the type of innovation may be important as, for instance, process innovation could reduce costs having an immediate effect on price. Therefore, a more precise definition of innovation categories could help to determine certain competitive outcomes.

- As for the relationship between competition and innovation: there is a tendency to identify competition with concentration. In fact, however, the commentaries are questioning whether innovation is more or less present when there is more or less competition. The number of competitors on the market is not crucial in that regard, particularly when large R&D expenditure is involved. The delegate questioned whether there should not be a clarification of terms as regards the Y axis and X axis relating to competition and innovation.

- In reference to the HHI, there is a tendency to regard a monopolist at one extreme and lots of players at the other. If the monopolist holds an IPR, it may lead to increased market power but it does not necessarily indicate dominance. The analysis should be based on whether the player on the market is already a monopolist for other reasons.

Professor Scherer responded that innovation was more important than price competition as the penalties of retarded innovation are much more severe than the penalties of imperfections in price competition. As regards the sub-question on product versus process innovation, Professor Scherer referred to an article by Cohen and Klepper, showing a difference between market structure and the vigour of competition for process innovation. In fact, dominant firms have on average stronger incentives to engage in process innovation than do small fringe firms. This is in contrast to product competition, which constitutes about 75% of industrial R&D, as in this case a greater number of firms tends to result in more vigorous innovation.

As regards the number of players on the market, first the market needs to be defined. Innovation tends to take place in world markets, not individual domestic markets, so the number of players might be quite different in the relevant world market What is more important, however, is the degree of contestability as the policy objective should be to prevent market closure to new comers who might have better ideas.

Finally, Scherer remarked that patents do not necessarily result in monopolies or dominance. Although it may occur that dominance is related to one patent, a more important concern is agglomerations of patents that may close off a field of technology. Professor Scherer referred to his work with Dietmar Harhoff of the University of Munich on the value of individual patents and their finding that most patents are valueless.

A delegate from the **US** remarked that if the US system has so many valueless patents perhaps the best approach would be to fix the patent system and not simply tinker around with it after the fact with antitrust intervention, which is where more dangers lurk. The delegate then asked Scherer to clarify that his comment concerning compulsory licensing was limited to use as a remedy to antitrust violations. The delegate noted that more generalized use of this measure may be quite a dangerous exercise for competition authorities.

The Chairman indicated that it would be preferable to defer the response to this question in light of BIAC's contribution, which takes a very strong stand against any kind of compulsory licensing and the Brazilian contribution which discusses a change in Brazilian law facilitating compulsory licensing.

1.3 Mergers and innovation

The Chairman then considered the contribution from Canada concerning the issue of whether a merger might, although decreasing the number of players, also lead to a decrease in the cost of innovation, particularly when the merging firms were involved in related R&D such as in the Pfizer/Pharmacia case. The Chairman questioned whether the Competition Bureau in objecting to the merger on grounds that it would decrease innovation, also took into consideration whether the merger would have made R&D more efficient and less costly.

In response, a delegate from Canada stated that R&D efficiencies are considered in the merger review procedure as well as whether a process or product market is concerned under the IP guidelines. In the Pfizer transaction, one product was on the market and the other product was very advanced in the pipeline. In looking at the sort of costs involved and potential savings, the Bureau found that the costs were more associated with bringing the product to market than with R&D. The Bureau was able to clear the merger with remedies including divestitures and licensing arrangements that ensured that both products came into the market. Ultimately R&D savings were not considered sufficiently significant to be taken into account.

The Chairman remarked that the Czech Republic has a case which is fairly similar to the Canadian case as it also involved a merger between pharmaceutical companies which was approved even though it gave substantial market power to the merging firms. A delegate from the Czech Republic clarified that the case was slightly different as it involved the merger of the largest Czech and Slovak firms; but the merging entities were producing just generics, not original drugs. The merging entities were not strong enough to compete efficiently with much bigger firms and their financial power was limited so they could engage in research and develop for only a few products, although the companies did compete on the generics market to be the first mover. The Office concluded that the increase in financial power of the merging entities would enable more investment in R&D leading to the development of generic substitutes as well as eliminating some duplication in R&D. The Office imposed structural remedies on markets where the overlap of existing production was too high.

The Chairman then addressed a question to Professor Scherer about whether competition in R&D leads to more or less innovation as this is one of the issues raised, at least in the pharmaceutical sector.

Scherer distinguished between generic competition in pharmaceuticals and the development of new molecules, which are different universes in terms of costs and risks. At the R&D stage, competition (meaning contestability rather than the HHI), stimulates R&D. The threat of generic competition stimulates companies to engage in aggressive R&D to replace their existing patented products with better patented products. To simplify greatly, even in pharmaceutical R&D competition is desirable. But even in R&D, one must weigh economies of scale on the one hand versus the benefits of competition on the other hand. Although there is a tendency to promote mergers to avoid duplicative R&D, it should be kept in mind that R&D is inherently uncertain often having parallel paths with more than one alternative being pursued in trying to reach a solution for the general good.

In exceptional cases, where the R&D problems are fairly well defined and uncertainties are not high, such as development of large scale civilian airliners, one might consider merger to achieve economies of scale in R&D. Turning back to the pharmaceutical sector, on average, the cost to bring a new successful compound to market is approximately 400 million USD. In contrast, the costs involved in bringing a generic to market are only a few million. In a relatively small country like the Czech Republic, there are economies of scale in generic production, which would lead the authorities to consider that the advantages of combining operations and yielding the economies of scale outweigh the price competition considerations. Another factor is that competitive generic imports were also available. Expert knowledge of the industry is required to make these tradeoffs properly.

In response to the comment from the US, Professor Scherer clarified that his observations about compulsory licensing were intended as a remedy for anti-competitive practices not as a general blunderbuss to be used against any patent accumulations.

1.4 Remedies and innovation

The Chairman then asked Mr. Lupin to make a brief presentation on the issue of whether competition law remedies may have positive or negative effects on incentives for innovation and on whether the agencies and courts are capable of analyzing the innovation/monopolization trade off.

Lupin stated that he would address these issues through the example of his company, Qualcomm, which is dependent on innovation, not only for its success but for its continuing existence. He began his comments with three cautionary notes in fashioning remedies or proposed changes to regulation and enforcement policy.

First, one should be very careful to avoid any modification which weakens or destroys the incentives to innovate. The principal incentive for innovation is a strong predictable patent system based on property rights. In the absence of such a strong system of patent rights, many fundamental disruptive innovations that create dynamic competition and provide consumers with major technological advances simply will not occur. Secondly, in the enforcement environment, one should be sure there is evidence of an observable market effect prior to imposing remedies or changes in policy or the law. Finally, one should beware of any solution that proposes to substitute alternatives for the judgment of the marketplace when it comes to determining the value of IP.

Qualcomm is involved in the mobile communications industry. It is primarily a provider of technologies through a very widespread licensing program to the industry. It provides chipsets and software, for example, to handset manufacturers and to manufacturers of cellular network equipment. Qualcomm started in the late 80's with a radically new approach to cellular telephony, which made better use of very limited spectrum with a higher rate of data throughput. Understanding that an important factor in the cellular industry is that it is very capital intensive for fundamental inventions, Qualcomm obtained patents as it needed very substantial capital investment. As a start-up, Qualcomm recognised that it would need to ensure major equipment suppliers accepted the technology and provided equipment to carriers.

Probably the second major factor in the cellular industry is that it relies very heavily on standardization, which is typically accomplished through industry standard bodies. Patents became a very important part of the techniques and tools that would allow Qualcomm to share the technology and yet still ultimately achieve a return on investments if it was successful over a long period of time. Qualcomm was able to achieve commercial acceptance of its technology. Today Qualcomm's technology is the basis for all 3 G cellular systems. Qualcomm has entered into over 130 licensing agreements over the last 15 years with almost every industry player in the telecommunication industry and consumer electronics field. Qualcomm continues to innovate and will spend 1.5 billion dollars this year in fundamental research.

Without a strong predictable patent system and the ability to obtain royalties on technology that it shares widely with the industry, Qualcomm would have no way to ensure a return on its continuing investment. Would Qualcomm exist today without such a system? Mr. Lupin indicated that the answer is very clearly no. Would there be a 3 G cellular technology today without such a system? The answer is also probably no.

One observation that is that fundamental technology advances often come not from the existing well-established market players but from outsiders. Existing successful companies typically may be more resistant to change and less motivated to invest in fundamental disruptive R&D. The outsiders, of course,

don't have the same countervailing considerations, but they do have potential barriers to entry. A strong patent system levels the field as it gives some degree of certainty that if research is successful there is an established mechanism for obtaining a return and also for protecting against those who would attempt to expropriate the innovation.

The Chairman recognized Mr. Lupin's call for a strong and predictable system of international property rights. The interesting question is what constitutes a strong and predictable system, an issue on which BIAC would like to shed some light since its contribution makes a very strong statement against compulsory licenses in general.

A delegate from BIAC noted that competition laws and patent rights are intended to achieve the same goals, that of enhancing economic efficiency and promoting consumer welfare. There seems to be a consensus on this point among the submissions. Tom Barnett, in a recent paper, indicated that "strong intellectual property protection is not separate from competition principals but rather is an integral part of antitrust policy as a whole. Properly applied strong intellectual property protection creates the competitive environment necessary to permit firms to profit from their inventions which encourages innovation effort and improves dynamic efficiency." The corollary of this principal is that, as a matter of policy, competition law enforcement authorities should proceed with caution in dealing with the intersection between competition law and patent rights. Caution is particularly appropriate in analysing new and evolving technology-based industries which inherently experience rapid market developments and are highly dependent on innovation.

The delegate added that competition law should to the extent possible treat IPRs as it treats any other form of property. Such an approach ensures consistency and provides businesses with a large degree of certainty and predictability. The principal that IPRs are to be treated no differently from other forms of property for the purposes of competition law simply means that IPRs are neither particularly free from competition scrutiny nor particularly suspect. The mere ownership of a patent should not be presumed to grant the holder market power. Guidelines in the US and Canada, for example, make clear that the mere holding of an IPR does not create market power in the competition context. These authorities require the traditional competition law analysis of defining the relevant market taking into account other factors that determine the effects of IPRs on the market such as market concentration, entry barriers and technological change. Similarly, the EC guidelines note that there is no presumption that IPRs and license agreements as such give rise to competition issues.

The delegate also stated that the ability to refuse others the use of a patented innovation is an integral part of treating patent rights as a form of property. Businesses should be free to determine the circumstances and terms under which they would like to license and correspondingly refuse to license their IPRs. Regulatory authorities are not necessarily best placed to value these rights and determine the terms on which they should be exchanged. Even in the EC's *IMS* case, the bar is set very high. According to that case, compulsory licensing may be required where the IP is indispensable, all competition may be eliminated, and failure to order such licensing would prevent the emergence of new products for which there is a potential consumer demand.

What is essential is the balancing of IPRs and antitrust concerns. That balancing exercise is very difficult. The view of BIAC is that when in doubt the competition authority should err on the side of protecting IPRs, as that is the engine that has spurred innovation. For example, the refusal of a compulsory license in a situation where the competitor in the absence thereof would develop around the existing patent would actually further, rather than limit, innovation.

The Chairman then introduced the delegate from Brazil noting that Brazilian Law No. 8.884/94 provides the competition authority CADE with the possibility to recommend compulsory licensing to the

National Institute for Intellectual Property even if the anti-competitive practices have nothing much to do with IPRs.

A delegate from Brazil noted that indeed Brazilian competition law does allow CADE to recommend to the patent authority compulsory licensing of a patent. In practice, this decision will be taken only when the conduct is based on the abuse of IP protection even though the law does not require such a linkage. The cases presented in the Brazilian contribution illustrate this approach as applied to merger cases. The first cases reported are related to mergers involving biotechnology applied to the agricultural sector, more specifically to transgenic seeds resistant to glyphosate herbicide development where the Brazilian patent belongs to Monsanto. The restrictions imposed on the mergers were designed to keep entry open. The restrictions tried to avoid the time extension of the already expired patent on glyphosate-based herbicide, called Round-up, by using a tying strategy that limited the productivity guarantee of the Round-up Ready soya bean seeds to cases where the farmers used the Round-up herbicide.

Regarding another group of mergers also involving transgenic seeds and licensing agreements, CADE imposed a restriction in order to guarantee potential entry in the market for new comers. Due to exclusivity clauses in technology licenses with all the local seed companies which hold germoplasm banks, new transgenic seed suppliers would otherwise not have had the possibility to develop seeds adapted to Brazilian conditions. CADE needed to intervene because no one could bring another seed to market as they could not find partners to develop the varieties.

The only case which truly imposed compulsory patent licensing is very recent and relates to SIM cards, such as payment cards and phone cards. CADE obliged the merging companies to license their patents related to SIM cards to any interested party operating in the Brazilian market in any form. The restrictions followed a similar decision taken by the EC for the same firms. The control of the merging companies over patents was understood as a potential source of barriers to entry in the Brazilian market.

In view of the small number of cases and the limited restrictions imposed, Brazil is far from being aggressive on compulsory licensing despite the legal provision that can be used if necessary. The fact that the Brazilian competition authority has had few cases involving IP issues is a reflection of the lack of importance of patent registration as a competition strategy in the Brazilian marketplace as well as the extremely low investment in R&D. Therefore, the lack of innovation in the Brazilian economy is not a problem caused by restrictions on property rights imposed by the competition authority, but a much more complex issue to be addressed by other institutions.

The Chairman noted that at some level, all of the participants indicate that the system should be predictable and strong. But the view has been put forward that strong and predictable systems should not prevent the competition authority form intervening to order compulsory licenses, for example, if there is a risk that market entry will be blocked. Such intervention is predictable and doesn't really undermine the IP system.

Turning to Professor Scherer, the Chairman questioned whether compulsory licenses are likely to decrease the incentive to innovate, or whether there could be cases where compulsory licenses are a way to increase the rate of innovation.

Scherer responded that his early survey studies from 1956 to 1958 followed on the DOJ negotiated consent decree with IBM and AT&T for compulsory licensing of some 11,000 patents mostly at 0% royalties. With a few exceptions, the studies concluded that these decrees had not had a negative impact on the affected companies' incentives to invest in R&D. These finding were confirmed by other studies which indicated that first mover advantages are much more important in the decision to take the risks of investing in technological innovation than is the expectation of patent protection. Scherer mentioned a very

extensive survey of 650 US R&D managers by Richard Levin, now President of Yale University and co-Chairman of the IP Committee of the National Academy of Sciences, which has recently issued a report on the patent system. To supplement survey data, in 1974 when data by company became available in the US, Scherer returned to the question and found that companies that had been subject to compulsory licensing decrees were spending more relative to their size in the industry on R&D than the companies that had not been so affected. Therefore, in his view, the weight of the evidence suggests that compulsory licensing sensibly applied in cases of abuse or protracted monopoly positions simply does not have an adverse effect.

A delegate from Switzerland stated that as a general approach, compulsory licensing is viewed as the ultimate measure to take and which should not be used unless there is no other means. As an example, the delegate mentioned that the patent law reform in Switzerland provides for a single non-exclusive license for research tools, as there is a belief that in order to help innovation to grow, there is a special necessity to create access. Perhaps this type of regulation could be a more appropriate way of approaching this very delicate issue.

Mr. Lupin then stated that Professor Scherer had made perhaps the most important point on this issue in that it very much depends on the facts in a given situation. In the majority of the cases presented by Scherer, the companies investing in R&D were not planning to obtain a return on their R&D through a direct exploitation of the patent by licensing. Expectations for return on R&D were in other forms, through product innovation, product differentiation, cost reduction and so on. One can imagine in those cases, particularly where other forms of competitive conduct were also at issue or in a merger context where there were potentially constraining effects rising from the merger, that compulsory licensing could well be an appropriate remedy. In the case of a situation involving a company which is expecting to derive direct revenue from exploitation of patents, extreme caution in considering compulsory licensing would be warranted.

In Mr Lugard's view, what may be important in compulsory licensing is the reason a compulsory license is mandated. There may be static reasons, where potential licensees simply wish to produce the same product. In that case, there less reason to allow or even consider imposing compulsory licensing. There may be reasons much more related to dynamic efficiencies. In that case, there is more of a need to consider efficiency gains.

Secondly, Mr. Lugard expressed his puzzlement by the relationship between the US compulsory licensing case and the reaction of the companies on which compulsory licenses were imposed. If companies are confronted with compulsory licensing it may not immediately slow down their innovative efforts, but if the regulatory environment changed so that the balance between IP law and competition law was fundamentally modified in the sense that compulsory licenses would occur much more frequently, then the position of many companies might be completely different. There may be a difference between the reaction of companies which are confronted with compulsory licenses almost as an unexpected event and companies reacting to a regulatory environment in which compulsory licensing is much more common than it is now.

Professor Scherer noted that this is a very good point as in the study at Harvard Business School, interviews were carried out with both companies that had actually experienced compulsory licensing decrees and those that might be considered threatened by the overall umbrella. In some cases, companies were apprehensive but simply refrained from practices that would cause trouble with the antitrust authorities. The Harvard study did find one generalized effect from compulsory licensing and that was a tendency toward somewhat greater secrecy and somewhat less reliance on patents. Interestingly enough, the statistics found this effect strongest in the companies with a preponderance of patents on the process side. As it is easier to keep a process secret than a product, there was a generalized reaction in the

direction of relying somewhat more on secrecy and somewhat less on patenting to protect process innovation.

The Chairman then noted that the contribution from Finland raised another point which may be of interest to competition authorities. Usually, when faced with an anti-competitive practice, the authorities have fairly solid evidence regarding whether there are sufficient static efficiencies to allow the practice. In the case of dynamic efficiencies, however, one never has the certainty that those efficiencies exist. As a result, an anti-competitive practice should never be allowed on the basis that it could contribute to dynamic efficiencies because the evidentiary standard is not met. The Finnish delegation therefore proposed to explore the question of whether there could be alternative ways to solve this issue.

A delegate from Finland explained that their contribution focused on the nature of the challenge that innovation poses to competition law enforcement and policy. First of all, on the basis of empirical and theoretical literature, it cannot be questioned that a very difficult trade off between dynamic and static efficiencies exists overall. Nonetheless, in certain industries, situations, time periods and with certain actors in the market this kind of trade off may materialize.

The Finnish contribution formulated an extreme case where parties are seriously engaged in innovative activities, the innovative activities are necessarily connected to rather statically restrictive conditions, the significance of the innovative activities compares favourably with static effects and there are no apparent alternative circumstances where the same kind or better innovative output could materialize.

What is to be done in this kind of situation? The papers and the contributions give many examples of this kind of situation or one very similar. First, if real innovation is not involved, then the practices are exclusionary or collusive and the problem of innovation actually does not exist. Another possibility is that there are no innovative-specific circumstances such that the static conditions and innovation could be separated. A third possibility is that innovation actually is harmed. In consequence, the trade-off can be avoided in most cases. The need for clear and convincing evidence is another possibility. If the static effects are substantial, then there is not much room to accept the dynamic efficiency defence.

How often does this trade off happen? Standards or products of a platform nature were just mentioned and raise good questions as to the type of situation and frequency of occurrence.

Conditional decisions address these issues by allowing the parties to realize their innovative potential within a reasonable range of time depending on the nature of the innovation. Such decisions may nonetheless postpone an examination of the state of innovation which may later lead to the adoption of, for example, structural measures if innovation has not materialized. This is not an easy option but the question is: what would be conclusive evidence that innovation has been realised and implemented? The questions being asked relate to the type of situation, the length of period to examine and how to rectify the situation by structural conditions if innovation does not come about. These are difficult questions, but they cannot be avoided if one really wishes to tackle the trade-off issues.

The Chairman then gave the floor to the US delegation.

A delegate from the US mentioned the possibility that compulsory licensing could undermine rivals' incentives. For example, firm A – dominant or not – has property for which a compulsory license is being considered and there are a number of competitors. If it is taken as a given that one of the most important objectives is to encourage many new innovators, then one of the most damaging measures would be to create incentives not to undertake innovation. One of the concerns with compulsory licensing is that it will have a corrosive effect on the incentive of the rival. It will lead to petitioning behaviour rather than

innovating behaviour because it is easier to pursue access to an existing item than to put forth the effort needed to innovate. For a company trying to make the case to a government agency that it desperately needs a compulsory license to compete, it would be damaging through discovery or a mere leak in the press, to learn that, in fact, the company has made a robust effort and is on the cusp of coming to a technological workaround that would obviate the need for a compulsory license.

In the US, companies frequently petition the competition agencies, saying there is no way they can compete without access to X. The agencies reply: "I'm sorry, we haven't identified any anti-competitive harm. We can't intervene without an antitrust violation." Six months later the companies are still on the market and have come out with workarounds. This is not to say that compulsory licenses do not have their use. In the US they are used often in the context of mergers, for example, as a less drastic alternative to a divestiture. But it is very important for the enforcement agencies to keep in mind that the possibility of holding out the compulsory license to somebody else's technology does have a corrosive effect on the incentives of rivals.

A delegate from Italy then put forward a question for the US delegation. Assuming that intellectual property is like any other property, as BIAC also suggests, are there any differences with respect to physical infrastructures and what are these differences, if any?

The US delegate responded that there are differences in the sense that use of physical infrastructures typically can be made only by one person or company at a time. The unique characteristic of IP is that you can license it to dozens of companies. In terms of whether physical property is to be treated differently for antitrust purposes, this question depends somewhat on the context, but in general strong property rights already exist even for non intellectual property. Under US antitrust law typically you're not required to share your physical property with someone unless you chose to do so.

A delegate from Turkey then questioned whether BIAC had any empirical econometrical study to endorse its position against compulsory licensing.

A delegate from Mexico remarked that in the WTO there has been a very vivid discussion on compulsory licensing. The issue concerned creating a mechanism to produce medicines which were accessible to poor countries that did not have the capacity for production even with compulsory licensing. This discussion just ended with a modification to the TRIPS agreement. The delegate questioned whether this modification of the TRIPS agreement really generated any damage to the research and investment capability of companies producing medicine for diseases such as malaria, tuberculosis and AIDS/HIV, especially for African countries.

BIAC responded that the WTO rules on IP are contained in the agreement on TRIPS which requires WTO members to grant exclusivity to patent holders. Immediately following this provision, however, the rules provide for the possibility to impose a compulsory license subject to a number of important conditions. Certain conditions are not applicable if the compulsory license is intended as a remedy to anticompetitive conduct. For example, general rules on compulsory licenses provide that a company wishing to obtain such a license must first attempt to obtain a voluntary license. However, this rule does not apply to cases of anticompetitive conduct. As regards the question from Mexico, the WTO rules were modified in 2003 as confirmed in December 2005 to facilitate access of poor countries to public health.

The Chairman stated that the question related more to the effect on innovation of the modification and asked Professor Scherer to comment.

Scherer expressed surprise that companies would ask the FTC for compulsory licensing to enter a field because they haven't done the research. In his experience, he knew of only one case in which that

happened: the SCM lawsuit against Xerox. As SCM lost the case, it intervened in the FTC's proceedings. The FTC staff viewed SCM's actions as simple self interest as they were not an active player in the market, and had not tried to be so. The FTC ignored their request and looked at the broader public interest.

Secondly, as for the difference between physical and intellectual property, Scherer suggested for remedial reading Thomas Jefferson, the first US patent examiner. In Jefferson's view there is no such thing as property in inventions, as patents are completely different from physical property and have different rationales.

Third, the Doha Cancun resolution is a very sensible solution to a very serious problem. It's been addressed in a variety of fora including a conference between the WTO and the WHO in Norway in 2001. Scherer wrote a paper identifying the problem and it led to the Doha Cancun change in the TRIPS agreement.

The Chairman said that there seemed to be another side to the Mexican question: is there any evidence that this weakening of IP rights has led to a lower level of innovation by the firms concerned?

Professor Scherer commented that to the extent this measure has been implemented it is mostly by bargaining rather than by the formal invocation of compulsory licensing. It primarily concerns less developed countries which represent just a tiny part of the world profits derived by pharmaceutical companies. Whatever effect there may have been is *de minimus*. As markets in the third world are so weak, the major problem is finding research incentives for medicines targeted against diseases mainly occurring in the third world. With or without a patent system, there is insufficient incentive for R&D investment. Therefore, alternative mechanisms have been sought including the G8 initiatives of about nine months ago to develop guaranteed markets for certain kinds of vaccines against third world diseases and the kind of work that the Gates Foundation is doing.

The delegate from Mexico added that if this is a very small market which does not have any impact on global R&D, it is incredible that on the international level it took so many years to generate a solution for a major problem concerning a large proportion of populations in poor countries.

The Chairman summarized the first part of the discussion, which started from the idea that innovation is a societal objective and focused on whether competition promotes innovation. Participants talked about the inverted-U theory, finding that it is probably rivalry which is the dynamic factor facilitating innovation. To the extent competition policy and enforcement increases rivalry, the discussion considered the means that are used and whether some of those means are in fact undermining the IP rights system. Throughout the conversation, the underlying assumption was that IP rights themselves are good for innovation.

2. Patents, Patent Laws and Innovation

What are the different aspects of the relationship between IPR and innovation? The Chairman opened the second part of the round table by asking Professor Hall to provide an overview of the issues, particularly on the extent to which changes in patent systems in OECD countries have had an effect on the intensity of innovation.

Hall introduced began by clarifying the use of the words 'monopoly' and 'market power'. These terms simply describe the situation where prices are above marginal costs. Patents don't create monopolies. Nevertheless, firms apply for patents in the hope of obtaining market power. In some sense, this is the goal of the patent system, so the use of the word 'monopoly' or 'market power' should not necessarily indicate that antitrust authorities must intervene. The traditional view of patents is that they provide a positive incentive for innovation, but the downside is that patents grant some short term market power to firms. In

certain industries, however, particularly the ones based on standards where there is a substantial network effect, market power can become quite long term unless patents accelerate the pace of innovation.

There is a growing concern that patents could have a negative effect on innovation particularly with respect to cumulative innovation, where there are many patents on a particular product, but they could also have a positive effect on competition. For instance, venture capitalists recognize that for investment purposes, patent protection is the only important asset for many high tech companies that possess knowledge assets.

Patent protection grants a very limited term right to exclude in return for innovating and revealing the invention in question. This traditional view says patents are good for innovation and bad for competition, but patents may help competition by facilitating entry. The presentation from Qualcomm was intriguing as it is another example of competition enhancing vertical disintegration in industries where trade in technology rather than trade in goods is the norm. In this case, licensing inventions created an enormous industry beneficial to society at large.

Taking the hypothetical case in which Qualcomm could not have used patents to protect their technology; it would no doubt have resulted in a large vertically integrated manufacturer, supplying cell phones, service and technology in order to protect the investments. In the alternative, there would have been innovation, perhaps not as rapid but it probably would have led to a different industry structure.

The question of inhibition is difficult because you don't see the dog that doesn't bark. In other words, the amount of innovation inhibited by the existence of patent thickets is difficult to determine as inventors will simply find alternatives rather than complain about difficulties in obtaining assurances as to non infringement.

When do patents encourage innovation? On an economic theoretical level it's fairly straightforward, if there is one patent per product in a static world, it's very clear that it is going to encourage innovation. If there is one patent per product but it is building on past innovation it's also true that innovation will be encouraged. There may however be problems obtaining a license for the original invention the innovation is building on. It may be difficult to find the right price, leading to an outcome which is not best for either firms or consumers. For instance, the maker of a new cell phone will build on some earlier inventions, either his own or those of someone else. If, in this setting, there are stronger patents or more patents as patents are easy to obtain, does this result in more innovation? The best paper on this is by Eric Maskin and Jim Bessen. It shows that innovation is not always favoured in these circumstances, particularly not if there is a lot of uncertainty or if the population of inventions looks as Professor Scherer has characterized it, with many patents not being very valuable and a few being quite valuable. If that is the distribution of possible outcomes, then it could be that there is actually less spending and less innovation if you have stronger patents.

That is economic theory. Economic evidence is tough to obtain because it requires counting and measuring innovation. Counting patents doesn't work for this question. As for whether patents encourage innovation, a change in the rules to make patents easier to obtain or stronger clearly results in more patents but that doesn't mean that there is more innovation.

On this question, 19th century studies have the advantage of typically looking at a set of European countries and also possibly the US and Canada, where certain countries had patent systems and others – notably Switzerland and the Netherlands – didn't. There was also a lot of variation in the patent term with some countries having short terms and others longer ones. As a result, one could look across those countries and question whether they innovated more or less, after controlling for size and other factors, if they had a patent system. According to a 2005 study by Petre Moser on the Crystal Palace exhibition in

London in 1868, the level of innovation didn't seem to vary much across countries regardless of the existence of a patent system. However, the type of innovation did vary; in countries without a patent system, innovation focused on sectors and technologies where it could be kept secret. These results were confirmed by Lerner in 2001 who engaged in much the same type of exercise. The 20th century evidence is much more finely focused, but does include one study which finds a positive effect of patenting on R&D.

Recently Professor Hall and four co-authors did a series of studies on developments in the US concerning patent and non-patent holding firms in hardware and software. The Circuit Court of Appeals in a series of decisions in 1994 and 1995 ruled in favour of the issuing of software patents, against the US PTO's decisions. At the time, the US PTO was attempting to hold the line at something that roughly approximates the present day European Patent Office position. In the end, the PTO issued guidelines as to patentable software. As a result, business patents became widespread in US companies.

Researchers then looked at the effect on industries and firms. First, the five day stock market rate of return for the firms affected by those decisions makes clear that software firms - especially application software firms - experienced negative returns around the time of those decisions. Accordingly, this was not viewed positively for downstream software firms. As for upstream or hardware companies, it wasn't viewed particularly negatively as software patents were not considered a large part of their business. However, after 1995 software patents became clearly more valuable than other patents to the firms that owned them. Firms shy away in general from the product classes where they see a lot of software patents. But for a company that holds some of these patents, it is more likely to enter those markets and is less likely to exit them due to survival and viability.

Large scale surveys administered to R&D managers in the US both in 1983 and 1994 were similar to the last four EU innovation surveys on product innovations. Hall referred to a paper by Anthony Arundel from 2001. The paper concerned the perceived effectiveness of different mechanisms for securing returns on innovation. The mechanisms included patents, trade secrecy, lead time (meaning being the first to market) and sales and services provided to the customer. The main conclusion was that, in general, firms rank lead time and sales/service more highly than they rank patents and secrecy for securing returns to innovation. However, it's still true that 11% of the firms ranked patents first or second, so this doesn't mean that patents don't matter for innovation. The right interpretation is that there is much heterogeneity among firms and in how they are securing returns to their innovations. For some segments of the market patents are quite important. The Carnegie Mellon survey has numbers that are roughly in the same order of magnitude except that secrecy has become more important.

As for process innovations, the message is basically the same except that patents are less important. They've slipped down to fourth and secrecy is a little more important as process is easier to protect with secrecy. Arundel's 2001 numbers basically say that lead time advantage is the number one way firms secure returns to innovation.

As for sectors where patents matter, in general the number one sector is pharmaceuticals, followed by plastics, chemicals, medical instruments, and sometimes all or parts of special machinery. In Europe the data is not as clear because the survey reports don't include pharmaceuticals. But 40% of the chemical firms ranked patents first for securing returns to innovation.

These results highlight something that is becoming fairly common. The simple assessment of heterogeneity is that there are discreet and complex product technologies. This assessment aligns to a certain extent with certain industries, but not perfectly. Biotechnology –although it's in the pharmaceutical sector – has some characteristics which are beginning to look like complex products. This alignment can be used to predict whether a firm will be in favour or against certain changes in patent policy. In general, patents are more important for appropriability purposes ensuring direct returns to innovation in discreet

product industries. The strategic uses of patents in cross licensing and negotiations are much greater in complex product industries. Complex product industries are simply industries where each product may have several hundred patents whereas discreet product industries concern products which have one or a few patents mostly owned by the same firm producing the product.

The conclusion on the bulk of the evidence is that the role of patents in encouraging innovation is ambiguous. In complex product industries, there are many firms which are not very enthusiastic about patents. Nonetheless, firms such as Qualcomm will view patents as very important in complex industries because they are a technology firm. So on balance the view on patents is neutral or negative, but there are definitely firms which take a positive view. There is considerable heterogeneity as patents may actually help competition if they facilitate entry or leap-frogging technologies.

Another evident concern relates to the application by patent offices of a uniform standard of patentability across industries and technologies. If an economic analysis of costs and benefits is not mandated, it is not performed. Competition authorities, especially in this area, will rely entirely on rule of reason, and each case is evaluated differently, based partly on an economic cost/benefit analysis. As a result, competition and patent policies are not comparable at least for the moment. Every so often, however, the 'one-size fits all system of patents' is questioned, if one starts thinking about policy.

As for changing patent policy other than the one-size fits all system, the first issue is raising the bar. A bigger inventive step and stricter non obvious requirements will cut down the number of patents as well as the thickets. The benefit/cost ratio is very likely to be larger for the higher inventive step. The loss is negligible as many of these patents are just causing trouble. The value is in patents that make big changes for consumers and for companies. The second problem concerns damages in complex product industries. If each of 400 patents is essential to the production of a product and they are owned by 400 inventors, there is no way all 400 inventors can be paid off. For some firms, when they are threatened on a small piece of their technology, it is cheaper for them to settle. This occurs even if the firm views the patent as invalid because the litigation cost would be very high and also because the patent happens to be essential for their activity. Assessing damages on a proportional basis is one way to discourage some of this activity.

The Chairman gave the floor to Spain for questions.

A delegate from Spain referred to the comment that when an invention is not properly examined, it may have a deterrent effect in the market in spite of its lack of novelty or inventive step due to the cost of litigation. How is it then that national patent offices obtain their income from fees? This question concerns only the European situation – it may be that at times a national patent office prefers to grant patents without proper examination because the renewal fee is higher than the cost of the examination fee.

The delegate also asked whether Hall has considered that the expansion of the European patent system to new fields such as biotechnology and software may also be the consequence of the aggregated interest of patent offices.

Hall clarified that the problem with weak patents is that the patent holder may apply for a preliminary injunction for the entire value of the product. Even though the patent may look invalid the risk of losing in court may be more costly than a settlement agreement.

Regarding the patent office fee issue, Hall said that economists generally don't think that fees should be linked to patent office performance. Because patent offices act in the general public interest, fees are not necessarily linked to services provided to companies. From a perspective of economic policy, patent offices should provide good services to companies, but receiving service fees doesn't mean that they should do exactly what those companies want.

Regarding renewal fees, which are usually assessed every four years, it is a very useful policy tool for ensuring that certain patents are cleaned out. In general, pharmaceutical companies will renew as they need the full term to recoup their investments. In fast-changing industries, there are many inventors who will not renew because the patent is not worth enforcing. One of the ways to target strategic patenting, that is piling large portfolios, is charging a fairly high renewal fee after the first five years which essentially puts the technology into the public domain pretty fast. In some cases, this tool may not be adequately used as fees are not high enough.

Concerning the expanding patent system, it has grown in the direction of software and biotech as these are huge markets with many inventions. This has come about because the companies were pressing for patents, not because the patent offices were looking for fees.

2.1 How are patents and patent regimes affecting innovation?

The Chairman gave the floor to Dr. Guellec, who discussed three topics: the explosion in the number of patents granted, the pro-patent policies of the 1980's and 1990's, and the assessment of certain effects on innovation and the economy at large.

Patent applications have increased by nearly 150% over the past 10 years in Europe and about 100% in the US, which means that the past decade has been an exceptional period. Not only have patent numbers soared but also the volume of individual patent applications measured by the number of claims and pages has increased by nearly 50% over the past 10 years. There are many explanations for this surge including an increase in the number of inventions in a knowledge-based economy and the impact of worldwide markets, which inflates the number of global patents. Markets are more competitive. For instance, deregulation and privatisation of national telecom monopolies have had a huge impact on the patenting industry. New organisation of industry and research has also played a part with the emergence of a market for technology and patents as a kind of currency on that market. Changes in the regulatory and legal environment have been important. The so-called pro-patent policy of the last 10, 15 or 20 years started in the US in the late 1970's and has progressively spread to all OECD countries. Patent strengthening measures include the creation of centralized court systems for IP matters, such as the CAFC in the US and the Tokyo IP High Court in Japan.

The second type of change is the extension of the subject matter to biotechnology and genetic material which became patentable first in the US, then in Europe in the 1990's. Software is patentable in the US. In Europe, certain software is patentable, but the tendency has been to progressively increase the area of patentable subject matter in that field. Another change has been higher damages awarded by courts. In addition, the TRIPS agreement is leading to upward harmonization of patent rights worldwide. Finally, patenting standards, notably the inventive step (or the "non-obviousness criterion"), have probably been lowered over these last 10-20 years. An OECD study three years ago asked companies if it is easier now than 10 years ago to obtain a patent in the US, Europe and Japan. The response of the majority of firms was that it is easier than before and that was even more the case in Europe than in the US.

Patent offices, patent attorneys, representatives to patent offices and patent officials in companies form a type of community which has been instrumental in developing these changes with relatively little scrutiny from the outside. This is probably why competition and legislative authorities are now also turning to this area, as it is probably in the general good that representatives of broader components of society would now be looking at the system.

The increase in patent numbers has been the highest in the areas where there are more inventions: software, IT, biotech. But probably more than just triggering inventions, patents have allowed a reorganization of these industries for the entrance of new firms specialized in research, as in the semi-

conductor and biotech industries. Without patents, these biotech firms would not exist, the research would be done by public laboratories and pharmaceutical companies.

As for criticisms of the reinforcement of the patent system to the effect that patents make access to research reserves more difficult and make it more costly to do research downstream, these criticisms are not supported by empirical evidence. For instance, in two surveys of researchers, the percentage who said that they stopped a research project or did not enter into one because they could not access patent protected material was between 1 and 2 %.

The Chairman then turned to Dr. Nicholaus Thumm of the Swiss Federal Institute of Intellectual Property to present his study on "Research and Patenting in Biotechnology – A survey in Switzerland." Thumm indicated that new data from WIPO indicates that over the last 10 years the number of patents worldwide had doubled. The question is: did this create more innovation? Patenting is about incentive for research and development in return for the loss of a little bit of competition. More important than theory though is to look at practices; patents after all are business tools, so one must look at how they are used.

Out of all inventions, it is common knowledge that only a few of them will become innovations. From the consumer side, patented inventions are interesting if they lead to patented innovation, resulting in new products on the market. However, from the business point of view, patented inventions not resulting in innovation may be more interesting, for many reasons which may be strategic, such as wishing to block competitors or simply because the patent is needed as a tool to provide freedom to operate or to increase licensing income. There are many motives and reasons for these kinds of patents, even though they are not innovations.

The Institute commissioned a survey on the Swiss biotechnology industry, as it is in the process of reforming Swiss patent law and wished to gain a greater understanding of the economic aspects of biotech patents and concrete practical problems. The survey consisted of interviews of more or less half of the industry. In response to the question: what is actually the importance of patents, the striking response was that it is to cooperate with other companies.

As for alternative tools of protection, patents are indeed very important but secrecy is equally important as is lead time advantage. However, in most cases, companies use both depending on the specific type of technology. When asked how high the percentage of potentially patentable inventions not patented is, the average response was 37% which is relatively high. These numbers are in the same range as in other surveys.

Dr. Thumm also noted that the Swiss data do not support the Schumpeter hypothesis, as the most innovative in terms of patents per employee and R&D are actually the small companies. Turning to the policy perspective, there is frequently an assumption that the stronger the protection the better for innovation. But this is clearly not the case. What is important for the process of policy making and as shown in the inverted U model, is that there is an area where a stronger level of protection will actually lead to more innovation whereas there is also an area such as in the case of patent thickets, which leads to less innovation. Therefore, one needs to determine whether, in practice, the tendency is to the left or to the right of this optimal protection level.

The focus of the patent law reform is clearly on the protection of biotechnological inventions where the Swiss Institute has identified the highest needs. The Institute looked at exclusion of patentability for reasons of public order and morality, for instance, barring the patenting of a reproductive and therapeutic process for cloning a human being or the patenting of gene sequences. The scope of protection for gene sequences is a permanent subject of discussion, and the issues of a research and experimental use exemption, research tool patents, and diagnostic testing have also been considered.

There is a certain dependency on previous patents, as there are difficulties to enter some technological fields but to a lower degree. The second survey in the area of genetic testing found a little more evidence. Survey participants were asked what steps should be taken to reduce the dependency on previous patents, to reduce transaction costs, to provide freedom to operate with these proprietary biotechnologies and to promote the dissemination of technology. Two issues clearly emerged: the broad research exemption and the protection of limited disclosure function for DNA patents.

Briefly, it is common practice that, per chemical component, there is one patent even though there might be different users. With genes that comprise proteins, this enables potentially a much larger number of possible users. If the patent on a gene is obtained with a specific function, then it covers all the others as well. As it was thought that this might cause some difficulty, there is an on-going discussion of whether the protection in this case should be limited only to a specific function. It is assumed that this practice has a positive impact on R&D.

The research exemptions are now in the new draft patent law and cover all new knowledge concerning the subject matter of the invention, as well as the so-called Bolar exemption which means that clinical trials and specimens are included but not pre-production nor stockpiling of drugs prior to the expiration of the patent. The exemptions do not include research tools, as explained previously, a specific legal licence is provided for in a separate article of the new regulation. That is the compromise which has been adopted.

In summary, there are some moderate access problems to biotech patents. The Swiss authorities encourage use of market tools and various types of measures, such as those provided for in the new patent law.

From a public interest point of view, it is more important to promote patents rather than secrecy as a means of protection. Patented inventions are publicly available providing at least potential access to technology whereas inventions protected by secrecy are only in the domain of the inventor.

In the Chairman's view, it is very hard to dismiss the idea that there is a strong sectoral dimension to all this. At some point the discussion should return to the fact that, on the one hand, IP rights are treated in very much the same way across sectors, and on the other, competition authorities favour case by case analysis in which the particular sector and local circumstances are important. This seems to indicate that competition authorities would be justified in having different types of solutions for different cases; but then the BIAC might ask: where is the predictability? A possible solution is guidelines and a little progress on this is being made.

2.2 How important are patents relative to other means of protecting investments in innovation?

The Chairman called on David Simon to discuss innovation in a world without patents and alternative means to promote innovation.

Simon addressed the topic of incentives other than patents for innovation. A key to understanding the patent system is that patents are probabilistic tools from several standpoints. First of all, in a company decision concerning what to patent and where to patent it, Simon stated that he worked with a team of technologists to determine where patent protection would be important in the future. In Intel's industry, this is frequently estimated at 5+ years out; however, very few people are very accurate at 5+ years out. One of the more well-known stories in the industry concerns 3M, which many years ago came up with what turned out to be a really bad glue. Someone came up with the idea of applying it to the back of paper to stick it onto other pieces of paper leading to the Post-it brand notes. As it was initially a bad glue, 3M didn't seek patent protection much to their regret as, many years later, it became a very valuable product.

Another probability is picking out what is going to be the right market for the product. For instance, Intel had an MP3 player many years before Apple came out with the Ipod, but the Intel product is not well known as Intel did not identify the right market at the right time in the right way. Nonetheless, the product helped the Intel patent portfolio. In this context, it becomes clear that in any company there are a limited number of resources which can be devoted to patenting. The question is: what are the best and worst places for return investment? This depends on the assessment of where future markets will develop and on where legal regimes will be. As this is often comparable to a dartboard experience, due to the uncertainty in political regimes, there has been a large increase in patenting, as studies indicate that it is a matter of a lot of luck and some skill.

The second point is that companies will assess where they may be the most lucky, in order to obtain the best return on their investment, taking into account that patent programmes over the years can cost tens of millions of dollars.

With respect to other meaningful types of protection, although the discussion has not focused much on copyrights, they are certainly in some domains a very good way to provide protection. In other domains – particularly in Intel's industry - the ability to protect what the design looks like can sometimes be critical to design whereas at other times it is virtually meaningless. Other factors include secrecy and time to market. One of the issues is where the bets should be placed. In addition, with any patent portfolio, the question is how big is enough? Although the filing of more patents may suggest more innovation, Simon questioned whether patent numbers are a good benchmark for measuring innovation. Using patents as a raw number can be very deceptive. From a numerical standpoint, a critical volume is reached where the next patent incrementally is not going to make a big difference. There is an incremental value patent portfolios have to deal with both in quality and quantity. At a certain point, when a certain quantity is reached, the company will file for fewer patents in that area. This may influence the bias on some of the data coming from smaller organisations which tends to suggest they get more patents per employee; they are not necessarily more or less innovative, they may simply be in the growth of that portfolio curve.

In essence, another way to think about this, at least in Intel's industry which is very different from the drug industry, is from an investment standpoint. Some models used by Intel try to help it in making decisions as in an investment portfolio, much like a basket of stocks in a mutual fund.

The Chairman called on the Netherlands to review its findings on why firms innovate other than to attempt to obtain patents.

A delegate from the Netherlands explained that the Dutch Patent Act provides the possibility to apply for 6 year patents which are granted after a light procedure or for 20 year patents which require a renewal study 13 months after the application date. On average, there are annually about 1800 20-year patents granted and 600 6-year patents. Most patents concern processes and are granted to small and medium size enterprises and inventors, which account for more than 50 to 60% of all applications. Large companies usually apply for patents at the European level. An evaluation study of the Patent Act in 2006 indicated that applicants were satisfied with the patent law and especially appreciated the relatively short procedure, simplicity and low cost.

To assess how companies would proceed in the absence of a patent system, companies were asked about innovation activities if the patent system were repealed. More than 75% of the respondents indicated that their expenditures on innovation would remain the same. Some 15% of the respondent patent holders stated that their expenditures on innovation would decrease. The respondents are mainly Dutch investors and SMEs and the responses for the most part concern process patents. For companies in the chemical industries and pharmaceutics, European patents are an important incentive to innovate as was shown in a study by the Dutch Ministry of Economic Affairs in 2001. Their R&D investments are huge, a life line to

the future and European patents are a means to recover investment costs. These companies also possess strong civil law instruments, are technologically advanced and profit from lead time and secrecy. It should be noted that the Netherlands has mostly services companies, for which patents are only one way of protecting inventions. Other forms of protection are trademarks, copyrights, and plant breeders' rights. As mentioned earlier, secrecy is an alternative to patents, especially for process innovation. Recoupment periods, R&D intensity and the risk of creative destruction differ widely across various sectors. For example, the difficulty of copying a sewing machine is smaller than that of copying a DNA processed medicine. The above considerations taken together may explain the finding that innovation activities in the Netherlands would remain at the same level if the national patent system were repealed.

A future research subject being considered by the Dutch Ministry of Economic Affairs concerns cooperation between companies that are active in different sectors on innovation, also known as 'open innovation'. An example is cooperation between chemical companies which cherish patents and manufacturing companies which are less fond of patents.

3. General Discussion

The Chairman opened the floor to a general discussion followed by a word from each of the panellists.

The EC delegate took the floor, noting that Professors Hall and Scherer both questioned the relationship between IP and innovation and suggested that IP systems should be established selectively from a competition point of view. The reality is that patent systems exist and it is to be hoped they will developed in an informed way. In relation to Professor Hall's remarks on competition and innovation policy, the basis is the rule of reason. Of course, use of a rule of reason for IP law leads to a very difficult procedure of effects-based analysis. It seems essential that there should be dialogue ex ante on the design of IP laws which takes account of the potential impact at least in a general sense on each sector concerned. It should be clear that the benefits in terms of incentives to innovate, rewards for innovation, disclosure and dissemination of information aren't outweighed by anticompetitive effects.

As for competition policy, it should be noted that certain factors not related to IP law could eventually be used to facilitate innovation. The OECD research report finds that anti-competitive product market regulation is six times more important than certain other factors in determining the rate of innovation. The new EU state aid framework encouraging Member States to target specific types of innovation would also be relevant.

Turning to Professor Hall's comment on market power, the EU delegate agreed that acquisition is generic to a competitive market, meaning extra but not abusive market power. Being a holder of rights as pointed out by BIAC doesn't confer market power; rather the successful application of that right will do so. Nonetheless, there may be cases where a holder of IPRs has significant and durable market power even in leap frog markets. In that case, there is a potential field where significant market power combined with certain practices in the use of patents or other aspects of IP law could justify, on an exceptional basis, antitrust intervention. One additional complication is related to secrecy. In many cases, behavioural commitments of a company obtained in the interests of long run dynamic competition and consumer welfare may not be covered by IP law; rather it may simply be a question of trade secrets. Therefore, the question of what standards and protection should cover trade secrets needs to be addressed by competition authorities, companies and IP lawyers.

The delegate from Turkey then questioned to what extent a reform to the patent system would infringe binding international agreements which are currently in force.

Simon replied that there are a number of reforms which may be carried out without violating the TRIPS agreement. For instance, the creation of specialized courts for patents in Japan or the US cannot be considered a TRIPS violation, without taking a view on whether they should come into being. A second comment concerned ex post versus ex ante enforcement. In rapidly moving technology worlds, prediction has proven difficult and this uncertainty as to the future should be taken into account by the enforcement agencies.

Lupin then intervened with a cautionary note for the international competition community: an injudicious application of the essential facilities doctrine, coupled with notions of compulsory licensing creates a danger of price regulation of IP licensing.

Lugard concluded with the view that one has to take a pragmatic approach with respect to patenting and that it is not feasible to come up with a single system for many different industries.

This requires following business activities as well as close cooperation with the relevant competition authorities. Further to the point mentioned by Hall, Lugard suggested that the policy brief arising out of this meeting should clarify the difference between patent ownership and IP monopolies so that the confusion on this point could be cleared up, which would assist in other policy fora and avoid useless discussion.

With regard to the Chairman's question concerning an ex ante view on competition problems in the field of IP, Lugard expressed the opinion that this type of intervention is very difficult and that the authorities should stick to ex post consideration when problems come up. Lugard concluded with a quote from Frits Machlup from 1958 saying: "if it didn't have a patent system it would be responsible on the basis of our present knowledge of its economic consequences to recommend instituting one. But since we've had a patent system for a long time it would be irresponsible on the basis of our present knowledge to recommend abolishing it."

Dr. Guellec indicated that from a public policy perspective, the patent system has a mission which is to encourage innovation and possibly diffusion. In a couple of countries this has more or less been put aside by institutions in charge of managing the system. In consequence, certainly it would be not only time to remind all institutions involved in the system, but also to set up regular evaluations as is the trend now for public bodies. Patent offices also should be evaluated regularly to determine, on the basis of their mandate, the extent to which their activities contribute to fulfilling their mission of encouraging innovation and diffusion. Conducting such exercises would improve knowledge of the system and would encourage patent offices to work more towards this mission.

What can be the role of a competition authority in that process? First, it is important that competition authorities have a close relationship with patent offices in terms of exchanging information, opening the view of judges in charge of the patent system, informing patent officials and so on of the economic consequences of the choices made by the patent office, even if these choices should not be explicitly based on economics. But these choices have economic implications and officials there have to be aware of that. Secondly, more specifically for Europe, which has a so-called opposition procedure in patent applications, a third party can request the Patent Office to revoke the patent in the nine months following its grant. At least in Europe, competition authorities could be encouraged to use this procedure in case they consider that certain patents would really hamper competition on grounds that are not legitimate in view of the patent statute.

Scherer first referred to the observations of Robert Solow at a recent conference held in memory of the economist John Kenneth Galbraith to the effect that "We should not be afraid that once in a while we might have to set a price under something like compulsory licensing". This was also Galbraith's message.

Scherer then clarified that there are actually two completely different theories of how patents act as incentives to technological investment. There is the so-called 'prospect theory of innovation' which was popularized by Edmond Kitsch, but which is really based on William Nordhaus's pioneering analysis of optimal patent life. There is then the lesser known 'rent seeking theory' in which firms compete for patent monopolies and in the process, exhaust most of the rents that can be achieved from having a patent monopoly. At a conference sponsored by the University of Western Ontario about 20 years ago, a comparison of these theories showed that the Nordhaus so-called 'prospect theory' leads to an optimal patent life of about 20 years. With the 'rent seeking theory', there is an optimal patent life of about one and a half to two years. These are very different policy consequences which depend upon a very subtle first theoretical and then empirical phenomenon.

Hall then clarified that Fritz Machlup's statement in 1958 was made during the consideration by the US congress of patent reform measures. Mr. Machlup's student, Edith Penrose, stated in 1951 that "if national patent laws did not exist it would be difficult to make a conclusive case for introducing them. But the fact that they do exist shifts the burden of proof and it is equally difficult to make a really conclusive case for abolishing them".

Hall had two comments on Simon's remarks. The first concerned renewal fees; due to the uncertainty during the first five years as to whether a patent will prove valuable, renewal fees are generally cheap as compared to application fees. After the first five years, renewal fees are raised as much uncertainty as to the value of the patent is resolved during the initial phase.

Concerning, small and large firms, one has heard repeatedly the notion that small firms are producing more patents than the large firms. However, in looking at the large scale US economy that relationship is not apparent. The particular graph which was presented for biotechnology has to be interpreted carefully because small biotech firms engage in research the output of which is patents. As for large biotech firms, as some of them are in production or at least in development, their spending on R&D is a very different mix of activities. For instance, in pharmaceuticals, development results in products not patents. The same argument can apply to other industries. One must therefore be extremely cautious in making this distinction. As small firms and large firms in the same industry don't do the same thing, it's very dangerous to draw the conclusion that small firms are necessarily more innovative, although it's true that really radical new ideas usually come from small entities.

As for the rule of reason for patents, Hall clarified that she did not mean to imply that it would be a good idea; rather it is simply an interesting conundrum on which to reflect. Of course, the basic implication is that competition authorities have to pay fairly close attention to patent systems and how they are used. It is not reasonable to expect the patent system to essentially evaluate each patent for its anti-competitive effect or pro-competitive effect.

With respect to the issue of what Scherer calls 'prospect theory' vs. 'rent theory', Hall interpreted this as the 'competition yields too much innovation' argument which is really rent theory. With economic theories in this area, if an answer is required there will be a theorist who will obtain it based on certain assumptions. In consequence, Hall relies mostly on empirical evidence. There are rarely cases where competition yields too much innovation. The key example here is in the pharmaceutical area. The next Viagra is a huge benefit to the firm who invents it and takes out the patent to make a product slightly better, but is of small incremental benefit to the public. This might be a case where too much R&D is being spent. But in general, as was implied earlier by Scherer, there are so many different ways to obtain an innovation, that firms are not really pursuing the same strategy.

On international agreements and patent reform, most of the reforms discussed, in the US at least, will not cause any problems with international agreements; in fact the good news is they might put the US in

conformity with international agreements, particularly on first to file. Nonetheless, there is one troublesome area, as TRIPS is fairly clear about allowing patents on just about any invention. As a result, subject matter restrictions may require a renegotiation of TRIPS.

In conclusion, the Chairman returned briefly to the strength and predictability idea developed by BIAC and to the beginning of the discussion when the UK delegate mentioned two developments since the last roundtable on patents and competition, those being the inverted U relationship and the distinctions between the different types of innovations, for instance, leap frog versus process. First of all, we have discovered thanks to one of the presentations a possible other type of inverted U between innovation and patents or strength of patent. It is a relevant question to ask whether too much protection will decrease innovation.

The discussion has also revealed that many other variables determine the way patents are viewed and how patent policy is established, with very different results depending on the circumstances and in this regard, a typology of sectors and situations has been presented.

There is general agreement that it is important to have a predictable system of IP rights. There is less agreement on whether a very strong IP rights system, which would exclude intervention of the competition authorities, would be advisable. As the method of the competition authorities is currently to proceed on a case by case basis, the drawing up of guidelines may increase the predictability of the way competition law will be applied to IP rights. But such guidelines would need to take into account that the particular circumstances and context are important in determining the treatment of patents and practices. For instance, as discussed, in some industries the process vs. product distinction may be important. Therefore, when it comes to relief in merger cases and possibly in other circumstances, a different concept of the trade-off between competition and IP rights may be applied. National patent offices do not assist greatly in this analysis as they tend to take a uniform approach.

Indeed there were three contributions – which were not discussed due to lack of time - Chinese Taipei, USA and Denmark - that dealt with this issue. Chinese Taipei found that there is no relationship between competition authorities and IP rights. The US and Danish submissions indicated that they had started a dialogue but in both cases the exchange had not focused much on establishing differentiations for types of sectors, innovations, or circumstances. Rather, the discussion centred on whether the protection of IP has gone too far. Maybe there is scope for developing cooperation between competition authorities to establish guidelines on how they should view the role of patents in different circumstances.

COMPTE RENDU DE LA DISCUSSION

M. Frédéric Jenny, président du comité de la concurrence, a ouvert les débats en signalant que cette table ronde avait suscité un grand intérêt, 16 participations ayant été reçues. De même, la communauté universitaire s'était montrée désireuse d'y participer. De la sorte, les débats seraient plus diversifiés qu'à l'ordinaire et s'attarderaient moins aux questions d'exécution. La table ronde s'attacherait à deux thèmes principaux : la relation existant entre la concurrence et l'innovation et la relation entre les droits de propriété intellectuelle et l'innovation.

Le Président a souhaité la bienvenue au panel d'experts :

- Professeur F.M. Scherer, Université Harvard ;
- Professeur Bronwyn Hall, Université de Maastricht et Université de la Californie à Berkeley (Californie) ;
- D[r] Dominique Guellec, Secrétariat de l'OCDE ;
- Paul Lugard, chez Philips International ;
- Louis Lupin, Chef du contentieux de Qualcomm ;
- David Simon, Premier conseiller juridique du service des brevets d'Intel ;
- D[r] Nicholaus Thumm, Institut Fédéral Suisse de la Propriété Intellectuelle.

1. Concurrence et innovation

Le professeur Scherer a lancé le débat en soulignant d'abord que la relation entre le degré de concurrence et l'incitation à l'innovation technologique est fondamentalement dualiste. La rivalité accroît le rythme du progrès technologique grâce à une stimulation du comportement et en garantissant l'exploration d'un éventail d'approches technologiques. Cependant, une rivalité exacerbée tarit la source des loyers pouvant être obtenus de l'innovation et décourage donc celle-ci. Cette constatation a donné naissance à la théorie dite du U inversé, énoncée pour la première fois dans les années 1960. Selon cette théorie, un degré moyen de concentration est propice au taux le plus rapide de progrès technologique. D'une part, le progrès scientifique et technologique et d'autre part, la croissance de la demande interagissent pour créer ce qu'on peut qualifier d'effet de « ciseaux » marshallien. En fonction de la valeur actuelle escomptée sur une certaine période, disons six ans, il devient rentable pour la première fois d'innover, les bénéfices pouvant être réalisés étant supérieurs aux coûts de recherche et de mise en marché.

À ce stade, seule une entreprise monopolistique établie ou une entreprise assurée d'accéder à un monopole peut en réalité innover de façon rentable. Toutefois, une entreprise monopolistique établie n'entreprendra d'innovations que lorsque les coûts auront diminué davantage de manière à maximiser la différence entre la valeur actuelle escomptée des coûts d'innovation d'une part et la valeur actuelle escomptée des bénéfices, d'autre part.

Un marché ouvert à la contestation plutôt qu'établi peut forcer les participants à innover plus rapidement. La concurrence pour une part du marché qui pousse ainsi à une innovation précoce est appelé destruction créative de Schumpeter. Une analyse plus poussée du même phénomène fait ressortir les raisons contribuant aux avancées technologiques qui stimulent l'innovation même en présente d'une entreprise monopolistique établie, accélérant par conséquent l'occurrence des innovations technologiques.

Cette situation se manifeste d'ordinaire lorsque la valeur actuelle escomptée des coûts de R&D chute soudainement en raison d'une nouvelle avancée scientifique ou technologique, généralement externe, qui crée un écart important entre les coûts et les bénéfices. Ce peut être aussi le cas en raison de la demande, lorsque celle-ci s'intensifie soudainement, par exemple, du fait d'un bouleversement du secteur de l'énergie qui augmente considérablement la rentabilité des appareils permettant d'économiser l'énergie. En pareilles situations, un fossé se creuse instantanément entre les avantages potentiels d'une part et les coûts de l'innovation, d'autre part, ce qui permet non seulement à une entreprise monopolistique établie, mais également à plusieurs entreprises d'explorer de nouvelles technologies de manière compétitive, rapprochant ainsi la date des innovations du point zéro. Une entreprise monopolistique s'efforcera tentera toutefois, même en pareilles circonstances, de retarder le processus.

Le fait qu'elles craignent le cannibalisme de leurs propres bénéfices constitue un autre frein pour les entreprises monopolistiques établies. Elles retarderont alors le processus aussi longtemps qu'elles ne sont pas menacées par une concurrence externe. Les rivaux de l'extérieur, par contraste, considéreront les surplus globaux avant innovation, combinés à la plus-value intrinsèque à la supériorité de l'innovation, comme autant de profits potentiels s'ils arrivent à damer le pion à l'entreprise monopolistique en lice. Confrontée à ce type de concurrence, l'entreprise monopolistique menacée peut essayer d'éviter la perte de ses bénéfices en adoptant ce qu'on appelle une « deuxième stratégie rapide », accélérant ses propres activités de R&D et prenant d'autres mesures visant à conserver ses bénéfices.

L'ouvrage à succès de Clayton M. Christensen, « The Innovator's Dilemna », traite d'une variation psychologique de ce phénomène. Christensen prétend que les entreprises en place se préoccupent davantage des améliorations demandées par les clients existants et ont tendance à négliger les innovations dites « dérangeantes ». Sur le plan de la politique, il est important que le taux maximal de progrès technologique maintienne le marché ouvert, de sorte que de nouveaux intervenants puissent menacer de s'approprier le marché en question, même y parvenir si l'entreprise établie ne réagit pas.

Le professeur Scherer a ensuite fait mention de plusieurs études de cas, notamment Intel. Lorsqu'Intel occupait seule le marché des microprocesseurs de 32 bits, sa courbe d'améliorations était relativement peu prononcée. Mais dès qu'AMD et Syrex ont commencé à faire concurrence à Intel dans ce domaine, la fréquence des améliorations aux microprocesseurs s'est accrue et Intel a lancé beaucoup plus d'innovations qu'elle ne l'avait fait en l'absence de concurrence. Encore une fois, la rivalité a stimulé l'innovation dans une situation de quasi-monopole.

Un certain nombre des autres études de cas mentionnées par le professeur Scherer sont présentées dans un article rédigé par l'American Bar Association et intitulé « Technological Innovation and Monopolisation » qui sera publié prochainement dans un recueil d'essais. Cet article aborde sept cas importants de monopole dans le secteur de la haute technologie aux États-Unis.

Le professeur Scherer a mentionné en dernier lieu le cas de Xerox qui, 15 ans après le lancement du photocopieur Xerox 914, occupait toujours 90 % du marché grâce aux importants brevets qu'elle détenait. La Federal Trade Commission a négocié avec Xerox un décret de licence obligatoire qui a clairement stimulé la R&D et entraîné des effets bénéfiques pour les consommateurs.

Le professeur Scherer a fait valoir que selon ses recherches et d'après le livre intitulé « Patents and the Corporation », les licences obligatoires ont eu peu d'effets défavorables sur les mesures d'incitation en matière de R&D. De façon générale, les sociétés considéraient que les avantages conférés aux innovateurs non protégés par brevet et la menace de destruction créative schumpeterienne constituaient des facteurs nettement plus importants que la perspective de la protection offerte par un brevet. Cette théorie a été confirmée dans des études importantes réalisées par Silberstein et Taylor, Mansfield, Richard Levin et al, Wesley Cohen et al. ainsi que plusieurs autres études de cas réalisées à bien plus grande échelle.

Le président a noté que l'introduction soulignait la complexité du processus d'innovation et la nécessité, pour se faire une idée de l'évolution de l'innovation dans un secteur donné, que des variables aussi bien stratégiques que structurelles soient prises en compte.

1.1 Quelles raisons les entreprises ont-elles d'innover ?

Le président s'est ensuite attardé aux commentaires de la Turquie, qui met en exergue la diversité des situations et les objectifs des entreprises au moment d'innover, et ce, dans différents types de secteurs.

Un délégué de la Turquie a passé en revue les affaires examinées par les autorités turques en matière de concurrence. Les entreprises s'engageraient dans des activités de R&D visant à créer des innovations pour diverses raisons. D'abord, sur les marchés tels que celui des technologies de l'information et des communications, la concurrence est axée sur le lancement constant de nouveau produit. Les entreprises innovent pour survivre et rester sur leurs positions, la technologie évoluant et s'émoliorant à un rythme effréné. Le délégué a fait référence à Schumpeter au chapitre de la création destructive, les entreprises traînant derrière étant souvent expulsées du marché. Ensuite, sur le marché GSM, en plus de l'existance de facteurs externes au réseau, l'opérateur en place est incité à innover pour conserver sa part du marché alors que les deux autres sociétés innovent principalement pour survivre sur le marché. Enfin, sur les marchés dits matures, notamment celui de l'alcool et des cigarettes, on innove principalement pour conserver sa part du marché, en raison des restrictions en matière de publicité.

S'agissant du secteur pharmaceutique, ce sont surtout les fabriquants de produits de marque qui se livrent à de la R&D et lancent de nouveaux produits. Dans certains cas, un nouveau médicament est lancé sur des marchés existants pour protéger la part du marché. Toutefois, la compagnie pharmaceutique qui lance un nouveau produit visant une maladie pour laquelle il n'existait pas de cure le fait principalement pour obtenir l'avantage d'être la première à occuper ce segment du marché. Enfin, les entreprises actives sur le marché du ciment n'ont aucun intérêt à innover, vu leur pratique de concertation des prix. Même si elles pourraient lancer de nouveaux produits de meilleure qualité à des prix moindres, elles s'en abstiennent, préférant la collusion.

Le président a souligné la complexité du problème selon le caractère disputable du marché, le rythme de développement des connaissances et les variations des prix de revient industriels. La nature du produit et l'ampleur de sa différenciation ont également une incidence. La question est pertinente tout particulièrement en cas de contrôle de fusion, car il est alors souvent nécessaire de prédire le potentiel d'innovation.

Le professeur Scherer a mentionné que le cas des entreprises turques ne diffère pas beaucoup de celui des entreprises japonnaises dans les années 1950 et 1960, tel qu'il est décrit par Daniel Okimoto dans son ouvrage captivant intitulé « Between MITI and the Market ». Les entreprises japonaises étaient minuscules au regard de l'économie mondiale, à cette époque, mais au chapitre des innovations, elles avaient en commun avec les petites entreprises américaines qu'elles comptaient sur la protection offerte par les brevets, laquelle pouvait de façon significative leur assurer cette marge de sécurité excédentaire leur permettant de se défendre contre les rapides imitations et l'érosion des bénéfices. Il s'agit bien entendu d'une lame à double tranchant dans la mesure où les brevets peuvent aussi être utilisés par les grandes entreprises pour empêcher les petites entreprises en démarrage d'accéder à leur marché.

1.2 La dominance a-t-elle pour effet d'encourager ou de décourager l'innovation ?

M. Paul Lugard a ensuite pris la parole sur la question subsidiaire de la relation entre la dominance et l'innovation et sur l'importance de se doter d'un cadre d'analyse pour les pratiques d'exclusion adoptées

par les entreprises dominantes susceptibles de menacer l'innovation, mais qui jauge également les gains statiques et dynamiques.

M. Lugard a d'abord discuté de l'idée que la recommandation la plus importante en matière de politique est de réduire les barrières à l'entrée. Les auteurs, dans le domaine de l'économie, nous disent que le taux optimum d'innovation n'est pas forcément atteint en situation de concurrence féroce. Le professeur Scherer venait de mentionner la relation en U inversé entre la concurrence et l'innovation qui, si elle a été en partie discréditée, indique néanmoins que dans plusieurs cas, une concurrence qui n'est pas absolue peut produire plus d'innovations. De même, il semble que les situations monopolistiques produisent moins d'innovations. Si tel est le cas, la stimulation de la concurrence par les prix pourrait ne pas être en toutes circonstances la meilleure approche à adopter. Par exemple, le marché des appareils électroniques personnels a pour caractéristique une forte érosion des prix, ceux-ci faiblissant rapidement, ainsi qu'une courte durée des cycles de vie. La guerre des prix étant féroce, il est très difficile d'innover. Ainsi, l'accroissement de la concurrence par les prix sur ce marché déjà très concurrentiel pourrait ne pas stimuler l'innovation.

S'agissant de la relation entre le droit de la propriété intellectuelle et le droit de la concurrence, il est bien établi que les deux ensembles juridiques ont pour but commun d'assurer l'efficacité économique et le bien-être des consommateurs. Il est toutefois possible de prétendre que le droit de la propriété intellectuelle est davantage orienté vers les efficiences dynamiques et que le droit de la concurrence se préoccupe peut-être un peu plus aux gains statiques, la séparation est loin d'être franche. Lugard a fait valoir que les autorités en matière de concurrence devraient se montrer très réticentes à intervenir quant à l'exploitation des droits de propriété intellectuelle. Deux domaines sont particulièrement sensibles, le premier étant l'octroi obligatoire de licences qui, de l'avis de Lugard, ne devrait être imposé que dans les situations les plus exceptionnelles, simplement parce qu'il fait échec à l'innovation. En Europe, il faudrait peut-être clarifier le critère *IMS* et examiner le texte actuel du document de travail sur l'article 82.

M. Lugard est d'opinion que les autorités en matière de concurrence devraient aussi se montrer très réticentes à estimer la valeur de la technologie et à évaluer, par exemple, les taux des redevances que les détenteurs de droits de propriété intellectuelle pourraient exiger. Une licence visant la propriété intellectuelle n'est qu'une composante de connaissance du produit final et la tentative de déterminer la valeur précise de cette connaissance comporte trop de risques dans une perspective d'innovation. Néanmoins, il y a des abus des droits de propriété intellectuelle à l'égard desquels les autorités devraient intervenir, par exemple, dans le contexte de l'établissement de normes, alors que les entreprises peuvent retenir leurs brevets, comme dans le cas de Rambus. Les autorités devraient aussi examiner l'imposition par les détenteurs de droits de propriété intellectuelle d'obligations excessives aux titulaires de licences. Ces clauses contraignent les titulaires de licences à abandonner leurs droits de propriété intellectuelle au concédant, les privant des moyens d'exploiter leurs droits.

Sur la question de l'évaluation des restrictions à l'innovation et à la concurrence par les entreprises dominantes, il n'y a aucun consensus quant au cadre et à la méthodologie à appliquer pour cibler les pratiques d'exclusion de ces entreprises, tout particulièrement si la conduite produit aussi bien des effets positives que des effets négatifs, et en présence d'effets dynamiques. Lugard a présenté trois propositions en vue de la préparation d'un cadre d'analyse :

- Parce qu'il est si difficile de déterminer instantanément si une conduite entrave ou non l'innovation et par conséquent, la concurrence, l'intervention *ex ante* est tout particulièrement risquée. L'intervention *ex port*, lorsque les autorités peuvent évaluer les résultats antérieurs sur le marché, doit être préférée à l'intervention *ex ante*.

- Les effets négatifs sur l'innovation ne sont probables que si la société est de fait dominante pour une période de temps durable. Il est nécessaire d'améliorer l'analyse de l'importance de l'emprise et de la position dominante sur le marché et de réconcilier les approches adoptées par différents territoires. Il est souhaitable que les travaux d'envergure entrepris par notre groupe se poursuivent à l'avenir, particulièrement en ce qui concerne les barrières à l'entrée et l'évaluation de l'emprise importante sur le marché.

- Il n'est justifié d'intervenir qu'en présence de la possibilité évidente de préjudice. Il faut évaluer les possibilités d'exclure les sociétés et l'intérêt financier à ce faire, nuisant à l'innovation, conformément au rapport EAGCP de juillet 2005, commandé par le Directeur Général de la Concurrence (CE) dans le cadre des débats de référence sur l'article 82.

La question la plus difficile est celle de savoir quelle norme, le cas échéant, prête le mieux à repérer comme il ce doit la conduite anticoncurentielle. Plusieurs critères sont actuellement mis de l'avant, mais celui de l'absence de motivation économique et celui du surplus des consommateurs attirent le plus d'attention. Ce dernier a pour but d'optimizer le surplus à long terme des consommateurs. Néanmoins, ce critère ne fait pas clairement la différence entre une bonne et une mauvaise conduite, car son application peut être trop large au chapitre du comportement efficient. Ce critère est aussi difficile à appliquer dans la pratique dans la mesure où il nécessite une certaine quantification des effets positifs et négatifs dans le temps, ce qui est tout particulièrement difficile si on prétend à des efficiences dynamiques.

M. Lugard a remis en question la nécessité du critère du surplus des consommateurs, soulignant que dans plusieurs affaires concernant de l'innovation, il était assez évident que la société dominante avait abusé de sa position et que l'innovation était retrainte. Par conséquent, on peut se demander si le critère de l'absence de motivation économique, d'une application plus aisée, ne serait pas apte à définir et repérer les situations défavorables à l'innovation.

Le président a noté qu'il y avait eu toute une série d'interventions provocantes, à commencer par celle du professeur Scherer sur la concession de licence obligatoire. M. Lugard a ensuite affirmé que la concurrence en matière de prix pouvait nuire à l'innovation, et pressé les autorités en matière de concurrence à être au moins plus conscientes de cette possibilité au vu de la relation en U inversé.

Un délégué de l'Italie a souligné que la concurrence est pluridimensionnelle. Le prix est un élément important des produits qui sont dotés des mêmes caractéristiques. Lorsque les produits diffèrent, le prix n'est qu'un des éléments, même si dans la pratique, il est très difficile de différencier la concurrence en matière de prix et des autres types de concurrence. La concurrence sur le marché de produits différenciés n'est pas, dans la plupart des cas, une question de prix mais peut le devenir. De façon générale, c'est le nouvel arrivant qui ébranle l'intégrité du marché et les positions monopolistiques. Les autorités en matière de concurrence ne se concentrent pas sur la concurrence en matière de prix, mais se préoccupe de toute concurrence, de façon générale.

M. Lugard a précisé qu'il entendait qu'une augmentation de la concurrence en matière de prix pourrait ne pas stimuler l'innovation sur certains marchés. S'il est vrai que l'innovation est source des gains les plus importants de la société et s'il est aussi vrai que la plupart des innovations naissent d'une structure de marché qui n'est pas parfaitement concurrentielle et où les marchés peuvent même être oligopolistiques, alors la constatation de l'inhabilité de l'augmentation de la concurrence en matière de prix à améliorer les résultats est importante.

Le président a ensuite présenté les recherches empiriques menées par le Competition Policy Research Centre de la Japanese Fair Trade Commission sur l'existence ou non d'une relation entre concurrence, innovation et productivité.

Un délégué du Japon a fait part du but des recherches, qui était d'entreprendre une étude empirique à partir des données disponibles sur les entreprises japonaises pour déterminer si la concurrence sur le marché stimule les efficiences dynamiques ou la croissance économique grâce à l'innovation. L'étude a conclu à une relation négative entre la concurrence sur le marché mesurée par HHI[1] et l'innovation représentée par les dépenses de R&D ou le nombre de brevets détenus. L'étude confirme ainsi la théorie dite de Schumpeter. Toutefois, elle a aussi conclu que lorsque les données étaient réparties en deux groupes en fonction de l'intensité de la concurrence sur le marché et de l'innovation en termes de R&D et du nombre de brevets détenus, la relation entre la concurrence sur le marché et l'innovation devenait positive pour un plus grand nombre de marchés concurrentiels, alors qu'elle demeurait négative pour un plus petit nombre de ces marchés. Cette partie de l'étude aboutit à un résultat tout à fait opposé à la théorie traditionnelle de la relation en U inversé. Le délégué a toutefois signalé que ces conclusions ont une lacune en ce sens qu'elles manquent d'importance statistique.

Il est conclu dans l'étude que la relation entre la concurrence et l'innovation est dans plusieurs cas complexe et qu'il y a amplement place à l'amélioration des modèles économétriques. Vu qu'il s'agit pour ainsi dire de la première étude empirique menée par le centre et que les conclusions sont mitigées, le délégué a indiqué que cette étude en elle-même ne pouvait avoir une incidence importante sur les politiques à ce stade. D'autres recherches empiriques sur les données japonaises pourraient être utiles à la JFTC dans le cadre de l'exécution de la loi et de ses efforts pour trouver le juste équilibre entre la protection des brevets et la prévention des conduites abusives.

Le président a fait remarquer l'existence évidente qu'un intérêt marqué à mieux comprendre la relation entre la concurrence et l'innovation ainsi que l'environnement national dans lequel évolue cette relation. Il s'est ensuite demandé comment ces études pouvaient servir aux autorités en matière de concurrence dans le cadre de l'exécution régulière de la loi et signalé que la contribution du Royaume-Uni était très significative à cet égard. Selon le Royaume-Uni, les schèmes économiques ont évolué depuis la première fois, il y a nombre d'années, ou cette question a été abordée, notamment à deux égards : (i) le type d'innovation fait une différence, l'innovation par dépassement se distinguant de l'innovation étape par étape ; et (ii) il existe selon certaines indications une relation en U inversé entre la concurrence sur le marché des produits et l'innovation.

Le président a ensuite demandé à la délégation du Royaume-Uni de développer ces affirmations et de commenter deux fusions mentionnées dans sa contribution, soit les cas de Bio-Rad Microscience et Car Zeiss et de Landis and Gyr et Bayard. Le président s'est demandé si l'évolution des conceptions de la relation entre la concurrence et l'innovation avait eu une incidence sur la décision de permettre ces fusions, qui entraînaient une forte concentration.

Un délégué du Royaume-Uni a d'abord répondu à la question générale de l'utilité de ces études. Les études laissent entendre que les autorités doivent examiner chaque cas de beaucoup plus près plutôt que de tenter de définir des principes d'application générale, ce qui explique pourquoi les autorités n'ont pas établi de principes applicables en matière de propriété intellectuelle.

Avant d'aborder les deux cas de fusions, le délégué a parlé d'une affaire de monopole concernant les jeux vidéo. Un nouveau marché s'est rapidement implanté au début des années 1990 pour les jeux vidéo portables. Il semblait y avoir un duopole entre deux fournisseurs japonais, Nintendo et Sega. On s'inquiétait que ces fournisseurs utilisent les droits de propriété intellectuelle pour contrôler l'accès à la fourniture des jeux pour ces machines ainsi que la fixation des prix de leurs produits. Un nouvel arrivant venait tout juste d'entrer sur le marché de façon très discrète. Même si le secteur se caractérisait par de rapides changements technologiques, les autorités en matière de concurrence ont recommandé la

[1] Index Herfindaht Hirschmann.

concession de licence obligatoire. L'un des fournisseurs concernés a été expulsé du marché, ayant rapidement perdu sa part de marché. Le nouvel arrivant, Sony, a augmenté en quelque cinq années sa part du marché de 0 % qu'elle était, pour ainsi dire, à plus de 50 %, et un autre nouvel arrivant, Microsoft, s'est rapidement taillé une place importante sur le marché avec son Xbox. Le délégué a fait valoir par conséquent qu'il s'agissait d'un cas où les autorités auraient mieux fait de s'abstenir d'intervenir et auraient plutôt dû constater le rythme des innovations technologiques et laisser le marché trouver sa propre solution.

Quant aux fusions mentionnées par le président, le délégué a indiqué que ces nouvelles études ont incité les autorités britanniques à analyser beaucoup plus attentivement les marchés concernés et le rythme des changements technologiques. L'affaire Landis and Gyr et Bayard concernait des compteurs d'électricité. Même en présence de quatre concurrents, disposant chacun de son propre système, le rythme des innovations était élevé et stimulait les techologies concurrentielles. De la sorte, il était probable que même en cas de fusion importante, la part du marché ne donnerait pas lieu à une emprise sur le marché et les innovations se poursuivraient, permettant de donner le feu vert en phase 1. L'affaire Bio-Rad et Carl Zeiss, concernant les microscopes, était plus difficile. Même s'il semblait y avoir des raisons convaincantes de croire que la fusion ne constituerait pas un frein à l'innovation, il était néanmoins important de mener une enquête plus approfondie. La Commission de la concurrence a conclu que la société achetée par Bio-Rad allait se retirer du marché de toute manière et que les deux fournisseurs restants avaient encore amplement intérêt à innover.

Le président a invité les participants à poser des questions sur les présentations effectuées à ce stade.

Un délégué de la Commission européenne a demandé au professeur Scherer et au panel de commenter les trois questions au regard de l'importance pour les politiques anticollusion de la relation entre la concurrence et l'innovation. Considérant les complexités mises au jour dans les contributions du Japon et du Royaume-Uni, certains éclaircissements terminologiques peuvent être utiles :

- En ce qui concerne la relation entre l'innovation et la concurrence en matière de prix, le type d'innovation peut compter, par exemple, la reconfiguration des processus pourrait réduire les coûts, ce qui aurait un effet immédiat sur les prix. Par conséquent, une définition plus précise des catégories d'innovations pourrait aider à déterminer certains résultats de la concurrence.

- S'agissant de la relation entre la concurrence et l'innovation, on tend à équivaloir concurrence à concentration. De fait, toutefois, on se demande dans les commentaires si l'innovation est plus ou moins présente en présence de plus ou moins de concurrence. Le nombre de concurrents sur le marché n'est pas d'une importance capitale à cet égard, surtout lorsque des coûts substantiels de R&D sont en jeu. Le délégué a demandé s'il ne devait pas y avoir clarification terminologique en ce qui concerne les axes Y et X se rapportant à la concurrence et l'innovation.

- Pour ce qui est des HHI, on tend à considérer que le détenteur du monopole est à une extrémité, tandis qu'à l'autre extrémité se trouvent une pléiade de joueurs. Si le détenteur du monopole possède un droit de propriété intellectuelle, son emprise sur le marché peut en être accrue, mais il ne domine pas forcément le marché. La question de savoir si l'intervenant sur le marché détient déjà un monopole pour d'autres raisons devrait sous-tendre l'analyse.

Le professeur Scherer a répondu que l'innovation était plus importante que la concurrence des prix, la pénalité pour un retard de l'innovation étant nettement plus lourde que celle qu'emportent des imperfections de la concurrence des prix. En ce qui concerne la sous-question de l'innovation des produits par opposition à la reconfiguration des processus, il a mentionné un article de Cohen et Klepper montrant

la différence entre la structure du marché et la vigueur de la concurrence pour ce qui concerne la reconfiguration des processus. De fait, les entreprises dominantes ont en moyenne davantage intérêt à entreprendre la reconfiguration des processus que les petites entreprises marginale. Cette situation contraste avec celle de la concurrence en matière de produits, qui compte pour environ 75 % des activités de R&D industrielle, le plus grand nombre d'entreprise dans ce cas ayant tendance à stimuler l'innovation.

Au chapitre du nombre des joueurs sur le marché, ce dernier doit d'abord être défini. L'innovation est plus susceptible de se manifester sur des marchés mondiaux, et non sur des marchés nationaux, le marché mondial pouvant compter un nombre significativement différent de joueurs. Plus important encore, toutefois, en est le caractère contestatoire, l'objectif politique devant être de prévenir la fermeture du marché aux nouveaux arrivants qui pourraient avoir de meilleures idées.

Enfin, le Professeur Scherer a signalé que les brevets ne donnent pas assurément lieu à des monopoles ou des positions dominantes. Même si une position dominante peut être liée à un brevet donné, l'agglomération des brevets pouvant mener à une fermeture d'un champs technologique est bien plus préoccupante. Le professeur Scherer a mentionné les travaux qu'il a menés avec Dietmar Harhoff de l'Université de Munich sur la valeur des brevets particuliers et leur conclusion que la plupart des brevets sont dénués de valeur.

Un délégué des États-Unis a fait remarquer que si le système américain comporten un si grand nombre de brevets sans valeur, il vaudrait peut-être mieux corriger le système des brevets plutôt que de le rajuster après coup en intervenant pour empêcher la collusion, ce qui est la zone où les dangers sont le plus susceptibles de survenir. Le délégué a ensuite demandé au professeur Scherer de préciser que son commentaire concernant la concession de licence obligatoire se limitait à l'utilisation de cette mesure pour remédier à des violations des règles anticollusion. Le délégué a noté qu'une utilisation plus généralisée de cette mesure était assez dangereuse pour les autorités en matière de concurrence.

Le président a indiqué qu'il serait préférable de reporter la réponse à cette question au vu de la contribution du BIAC, qui s'oppose vigoureusement à toute forme de concession de licence obligatoire et de la contribution du Brésil, où on examine une modification apportée à la législation brésilienne pour faciliter la concession de licence obligatoire.

1.3 Fusions et innovation

Le président s'est ensuite tourné vers la contribution du Canada concernant la question de savoir si une fusion, même si elle réduit le nombre d'intervenants, pourrait aussi réduire le coût de l'innovation, plus particulièrement lorsque les entreprises fusionnantes participaient à des activités de R&D connexes, comme c'était le cas de Pfizer et Pharmacia. Le président a demandé si le Bureau de la concurrence, lorsqu'il s'est opposé à la fusion au motif qu'elle réduirait l'innovation, a aussi envisagé la possibilité que la fusion augmente l'efficacité de la R&D et en réduise le coût.

Un délégué du Canada a répondu que l'efficacité de la R&D ainsi que l'existence d'un marché des processus ou des produits lors de l'examen de la fusion, selon les directives en matière de propriété intellectuelle. Dans le cadre de l'opération de Pfizer, un produit était sur le marché et un autre en était à un stade très avancé de développement. Lorsqu'il a examiné les conséquences en termes de coûts et d'économies potentielles, le Bureau a conclu que les coûts se rapportaient davantage à la mise en marché du produit qu'à la R&D. Le Bureau a pu donner son assentiment à la fusion sous réserve de certaines divestitures et de certains arrangements en ce qui touchait les licences de sorte que les deux produits puissent être mis en marché. En définitive, les économies réalisées sur la R&D n'ont pas été perçues comme suffisamment importantes pour être prises en considération.

Le Président a mentionné qu'un cas très semblable au cas canadien s'était retrouvé en République Tchèque, où il était également question d'une fusion entre des compagnies pharmaceutiques qui avait été approuvée même si elle donnait aux compagnies fusionnées une emprise importante sur le marché. Un délégué de la République Tchèque a précisé que l'affaire différait légèrement du fait qu'il s'agissait de la fusion des deux plus grandes compagnies tchèques et slovaques ; mais les entités fusionnées ne produisaient que de médicaments génériques, et non pas des originaux. Les entités fusionnées n'étaient pas assez fortes pour livrer une concurrence efficace à des entreprises beaucoup plus importantes et leurs pouvoirs financiers étaient limités de sorte qu'ils ne pouvaient s'adonner à de la R&D que pour un petit nombre de produits, même si les compagnies livraient concurrence sur le marché des produits génériques pour se hisser au sommet. Le Bureau a conclu que l'augmentation des pouvoirs financiers des entités fusionnées leur permettrait d'investir davatage dans la R&D, ce qui leur permettrait de développer des substitus génériques et d'éliminer dans une certaine mesure le chevauchement des activités de R&D. Le Bureau a imposé certains redressements structurels sur les marchés où le chevauchement de la production existante était trop marqué.

Le Président a ensuite demandé au professeur Scherer si la concurrence en matière de R&D suscitait plus ou moins d'innovation, puisqu'il s'agit d'une des questions pertinentes, du moins dans le secteur pharmaceutique.

Scherer a fait une distinction entre la concurrence livrée par les compagnies pharmaceutiques pour les produits génériques et le développement de nouvelles molécules, qui sont des sphères très différentes en termes de coûts et de risques. À l'étape de la R&D, la concurrence (soit le caractère contestatoire plutôt que le HHI) a un effet de stimulation. La menace d'une concurrence par les produits génériques incite les compagnies à s'adonner plus activement à la R&D pour remplacer leurs produits brevetés par de meilleurs produits brevetés. Pour simplifier grandement, la concurrence en matière de R&D est souhaitable même dans le secteur pharmaceutique. Mais même s'agissant de la R&D, il faut soupeser les économies d'échelle par rapport aux avantages que procure la concurrence. Même si la tendance est à encourager les fusions pour éviter le chevauchement des activités de R&D, il faut garder à l'esprit que l'incertitude est intrinsèque à la R&D, dont les parcours souvent parallèles peuvent ouvrir plusieurs voies différentes pour aboutir à une solution d'intérêt général.

Dans des cas exceptionnels, les problèmes de R&D étant assez clairement définis et les incertitudes plutôt faibles, par exemple, pour les gros avions de ligne commerciaux, on peut conclure qu'une fusion permettra des économies d'échelle pour la R&D. Dans le secteur pharmaceutique, le coût du lancement sur le marché d'un nouveau composé réussi se chiffre à quelque 400 millions de dollars américains. Dans un pays relativement petit comme la République tchèque, la production de produits génériques permet des économies d'échelle, les autorités pouvant alors estimer que les avantages découlant de la combinaison des opérations et des économies d'échelle réalisées l'emportent sur les questions de concurrence en matière de prix. Il fallait aussi tenir compte du fait que des produits génériques importés étaient de même en vente. Il faut connaître à fond le secteur pour arriver au bon compromis.

En réponse aux commentaires des Etats-Unis, le professeur Scherer a précisé que ses observations au sujet de la concession de licence obligatoire devaient être entendues dans le cadre d'un redressement de pratiques non concurrentielles, et non pas comme une façon maladroite de contrer toute accumulation de brevets.

1.4 Redressement et innovation

Le Président a ensuite demandé à M. Lupin de faire un bref exposé de la question de savoir si les redressements prévus par le droit de la concurrence peuvent avoir un effet positif ou négatif sur les

incitations à l'innovation et si les autorités et les tribunaux sont habiles à analyser les compromis à faire entre innovation et monopole.

Lupin a indiqué qu'il aborderait ces questions en donnant l'exemple de sa société, Qualcomm, qui dépend de l'innovation non seulement pour sa réussite, mais pour son existence même. Il a commencé par émettre trois mises en garde concernant les redressements possibles et les modifications proposées à la réglementation et aux politiques en matière de conformité.

D'abord, il faut faire très attention d'éviter toute modification susceptible d'affaiblir ou d'éliminer les incitations à l'innovation. L'incitation première à l'innovation réside dans un système fiable et prévisible d'enregistrement des brevets fondé sur les droits de propriété. En l'absence d'une système solide de droits conférés par brevets, plusieurs innovations perturbatrices fondamentales créant une concurrence dynamique et offrant aux consommateurs des avancées technologiques importantes ne verront tout simplement pas le jour. Ensuite, en matière de conformité, il faut être certain qu'il y a des raisons de croire à l'existence d'un effet observable sur le marché avant d'imposer un redressement ou un changement de politique ou une modification à la loi. Enfin, il faut se méfier de toute solution qui propose de substituer des mécanismes au jugement exercé sur la place du marché au chapitre de la détermination de la valeur de la propriété intellectuelle.

Qualcomm est active dans le secteur des communications mobiles. Elle est principalement un fournisseur de technologies ayant recours à un vaste réseau de licences concédées dans le secteur. Elle fournit des jeux de puces et des logiciels, par exemple, à des fabricants de combinés et des fabricants de matériel de réseaux cellulaires. Qualcomm a été créée à la fin des années 1980 avec une approche radicalement nouvelle de la téléphonie cellulaire qui mettait davantage à profit un spectre très limité et qui permettait une transmission des données nettement plus rapide. Consciente de la très grande importance, dans le secteur de la téléphonie cellulaire, des capitaux nécessaires aux inventions fondamentales, Qualcomm a obtenu des brevets car elle avait besoin d'investissements substantiels de capitaux. En tant qu'entreprise en démarrage, Qualcomm reconnaissait qu'elle devrait s'assurer que les fournisseurs principaux de matériel acceptent la technologie et fournissent du matériel aux entreprises de télécommunication.

Le secteur de la téléphonie cellulaire se caractérise principalement en deuxième lieu par le fait qu'il nécessite un très grand degré de normalisation, d'ordinaire atteinte grâce à l'intervention d'organismes de normalisation de l'industrie. Les brevets sont devenus une partie intégrante très importante des techniques et outils permettant à Qualcomm de partager sa technologie tout en générant un rendement sur ses investissements si elle était fructueuse pendant longtemps. Qualcomm a pu assurer l'acceptation commerciale de sa technologie. Aujourd'hui, celle-ci constitue la base de tous les systèmes de téléphonie cellulaire de troisième génération. Elle a conclu plus de 130 conventions de licence ces dernières 15 années avec la plupart des intervenants industriels du secteur des télécommunications et du domaine de l'électronique de consommation. Qualcomm continue d'innover et consacrera 1,5 milliard de dollars cette année à la recherche fondamentale.

Sans un système fiable et prévisible de protection des brevets et la possibilité d'obtenir des redevances sur la technologie qu'elle partage largement avec l'industrie, Qualcomm ne pourrait pas du tout garantir un rendement sur ses investissements continus. Qualcomm existerait-elle aujourd'hui, sans un pareil système ? Pour M. Lupin, il est clair que non. Y aurait-il aujourd'hui une technologie cellulaire de troisième génération sans un pareil système ? Probablement pas.

On observe notamment que les progrès de la technologie fondamentale sont souvent réalisés non pas par les intervenants bien établis sur le marché, mais par les nouveaux arrivants. Les sociétés qui réussissent déjà peuvent souvent résister davantage au changement et être moins intéressée à investir dans des activités

de R&D fondamentales pertubatrices. Les nouveaux arrivants, bien entendu, n'ont pas les mêmes préoccupations paralysantes, mais ils sont éventuellement confrontés à des barrières à l'entrée. Un système solide de protection des brevets rétablit l'équilibre dans la mesure où il procure un certain degré de certitude qu'en cas de succès de la recherche, un mécanisme établi permettra d'obtenir un rendement et de se protéger des tentatives externes d'appropriation de l'innovation.

Le président a reconnu l'appel de M. Lupin pour un système solide et prévisible de protection des droits de propriété intellectuelle internationaux. Il est intéressant de savoir ce que constitue un système solide et prévisible, question sur laquelle le BIAC aimerait jeter une certaine lumière, comme il s'oppose très vigoureusement dans sa contribution à la concession de licence obligatoire de façon générale.

Un délégué du BIAC a souligné que la législation en matière de concurrence et les droits conférés par brevets ont des objectifs communs, soit ceux d'améliorer l'efficience économique et de promouvoir le mieux-être des consommateurs. Les interventions semblent à ce titre faire consensus. Tom Barnett, dans un exposé récent, a indiqué qu'une solide protection de la propriété intellectuelle n'est pas étrangère aux fondements de la concurrence, mais fait plutôt partie intégrante de la politique anticollusion d'ensemble. Une solide protection de la propriété intellectuelle, appliquée convenablement, crée l'environnement concurrentiel nécessaire aux entreprises pour tirer avantage de leurs inventions, ce qui encourage les tentatives d'innover et améliore l'efficience dynamique ». En parallèle à ce principe, il relève de la politique que les autorités chargés de l'exécution des lois en matières de concurrence devraient agir avec précaution lorsque le droit de la concurrence et les droits conférés par brevets se rencontrent. La prudence est particulièrement de mise dans le cadre de l'analyse des industries nouvelles qui font appel à la technologie, qui fonctionnent dans un marché en rapide évolution et sont très dépendantes de l'innovation.

Le délégué a ajouté que la législation en matière de concurrence doit dans toute la mesure possible réserver le même traitement aux droits de propriété intellectuelle et aux droits de toute autre forme. Cette approche assurer l'uniformité et accorde aux entreprises un degré important de certitude et de prévisibilité. Le principe selon lequel les droits de propriété intellectuelle ne doivent pas être traités différemment des autres formes de propriété aux fins des lois en matière de concurrence signifie simplement que ces droits ne sont ni plus ni moins suspects du point de vue des contrôles en matière de concurrence. La simple propriété d'un brevet ne devrait pas être considérée comme accordant à son détenteur une emprise sur le marché. Les lignes directrices des Etats-Unis et du Canada, par exemple, établissent clairement que la simple détention d'un droit de propriété intellectuelle ne donne pas lieu à une emprise sur le marché dans un contexte de concurrence. Ces autorités imposent une analyse classique en matière de concurrence visant à définir le marché pertinent, en tenant compte d'autres facteurs pour déterminer les effets des droits de propriété intellectuelle sur le marché, par exemple, une concentration du marché, une barrière à l'entrée et des changements technologiques. De même, les lignes directrices de la Communauté européenne indiquent qu'il n'y a pas présomption que les droits de propriété intellectuelle et les contrats de licence soulèvent automatiquement des questions de concurrence.

Le délégué a également affirmé que la possibilité de refuser aux autres l'utilisation d'une innovation brevetée fait partie intégrante du traitement des droits conférés par brevet en tant que type de propriété. Les entreprises devraient être libres de déterminer les circonstances dans lesquelles et les modalités auxquelles elles souhaitent concéder une licence et de même refuser d'accorder des droits d'utilisation de leurs droits de propriété intellectuelle. Les autorités de réglementation ne sont pas forcément les mieux placées pour déterminer la valeur de ces droits et les modalités auxquelles ils devraient être échangés. Même dans le cas d'*IMS*, en Europe, la barre est très haute. Dans cette affaire, la concession obligatoire de licence peut être nécessaire si la propriété intellectuelle est indispensable, toute concurrence pourrait s'évanouir et le défaut d'ordonner une telle concession ferait obstacle à l'émergence de nouveaux produits pour lesquels il existe une demande potentielle des consommateurs.

Il est essentiel d'équilibrer les préoccupations touchant les droits de propriété intellectuelle et celles touchant la collusion. Il est très difficile d'atteindre cet équilibre. Le BIAC estime qu'en cas de doute, les autorités en matière de concurrence devraient pencher pour la protection des droits de propriété intellectuelle, puisqu'ils sont le moteur de l'innovation. Par exemple, le refus d'imposer une concession de licence obligatoire dans une situation où le concurrent se trouverait alors à développer autour du brevet existant, ce qui stimulerait, plutôt que de limiter, l'innovation.

Le Président a ensuite présenté le délégué du Brésil, indiquant que la Loi n° 8.884/94 du Brésil autorise le CADE, les autorités en matière de concurrence, à recommander la concession obligatoire de licence à l'Institut national de la propriété intellectuelle, même si les pratiques anti concurrence n'ont pas beaucoup à voir avec les droits de propriété intellectuelle.

Un délégué du Brésil a noté qu'en effet, la législation brésilienne en matière de concurrence permet au CADE de recommander aux autorités compétentes sur les brevets la concession obligatoire d'une licence concernant un brevet. Dans la pratique, cette décision ne sera prise que lorsque la conduite observée est fondée sur l'abus du régime de protection de la propriété intellectuelle, même si la loi ne crée pas ce lien. Les affaires présentées dans la contribution du Brésil illustrent cette approche telle qu'elle est appliquée à des fusions. Les premières affaires mentionnées se rapportent à des fusions dans le domaine de la biotechnologie appliquée au secteur agricole, plus particulièrement au développement de semences transgéniques résistantes aux herbicides glyphosates, dont le brevet brésilien appartient à Monsanto. Les restrictions imposées aux fusions avaient pour but de maintenir le marché ouvert. Elles tentaient d'éviter la prolongation de la durée, déjà expirée, du brevet pour un herbicide à base de glyphosate appelé Round-up, au moyen d'une stratégie restreignante limitant la garantie de productivité des semences de la fève de soya Round-up Ready aux cas où des fermies utilisaient l'herbicide Round-up.

Dans le cadre d'une autre série de fusions concernant de même des semences transgéniques et des contrats de licence, le CADE a imposé une restriction visant à garantir l'entrée éventuelle de nouveaux arrivants sur le marché. Les nouveaux fournisseurs de semences transgéniques n'auraient autrement pas eu la possibilité de développer des semences adaptées aux conditions brésiliennes, vu les clauses d'exclusivité comprises dans les licences de technologie conclues avec toute les entreprises locales de semences détentrices de banques de plasma germinal. Le CADE a dû intervenir parceque personne ne pouvait introduire de nouvelle semence sur le marché, ne pouvant trouver de partenaires pour en développer les variétés.

Le seul cas pour lequel une concession de licence obligatoire a véritablement été imposée est très récent et se rapporte aux cartes d'identification des abonnés (cartes SIM), par exemple les cartes de paiement et les cartes de téléphones. Le CADE a obligé des sociétés fusionnées à concéder une licence relativement aux brevets détenus pour des cartes SIM à toute partie intéressée active sous quelque forme que ce soit sur le marché brésilien. Les restrictions ont emboîté le pas à une décision analogue prise par la Communauté européenne concernant les mêmes entreprises. Le contrôle qu'avaient les sociétés fusionnées sur les brevets a été considéré comme un source potentielle de barrières à l'entrée sur le marché brésilien.

Considérant le petit nombre de cas et les restrictions limitées qui ont été imposées, l'approche du Brésil quant à la concession de licence obligatoire est loin d'être vindicative, malgré les dispositions juridiques dont il peut se prévaloir au besoin. Le fait qu'un petit nombre seulement de cas concernant la propriété intellectuelle ait été examiné par les autorités brésiliennes en matière de concurrence témoigne du peu d'importance de l'enregistrement des brevets en tant que stratégie de concurrence sur le marché brésilien ainsi que de la faiblesse des investissements en R&D. Par conséquent, l'absence d'innovation caractérisant l'économie brésilienne n'est pas un problème causé par les restrictions imposées sur les droits de propriété par les autorités en matière de concurrence, mais une question beaucoup plus complexe sur laquelle d'autres institutions devront se pencher.

Le Président a noté qu'à un certain degré, tous les participants indiquent que le système devrait être prévisible et solide. Mais il a été avancé que des systèmes solides et prévisibles ne devraient pas empêcher les autorités en matière de concurrence d'intervenir pour ordonner la concession de licence obligatoire, par exemple, s'il y a risque d'entrave à l'entrée sur le marché. Une intervention de cette nature est prévisible et ne nuit pas vraiment au système de protection de la propriété intellectuelle.

Le Président a ensuite demandé au professeur Scherer si la concession de licence obligatoire est susceptible de réduire l'intérêt à innover ou s'il peut arriver qu'elle en augmente le rythme.

Le professeur Scherer a répondu que ses premières études menées de 1956 à 1958 faisaient suite au décret pris par le département de la Justice après négociations avec IBM et AT&T concernant la concession de licence obligatoire à l'égard de quelque 11 000 brevets moyennant pour la plupart 0 % de redevances. Sauf rares exceptions, les études ont conclu que ces décrets n'avaient pas eu d'incidence négative sur l'intérêt des sociétés concernées à investir dans la R&D. Ces conclusions ont été confirmées par d'autres études qui ont indiqué que les avantages d'être le premier arrivé pèsent beaucoup plus lourd dans la décision de prendre le risque d'investir dans l'innovation technologique que la perspective d'une protection des brevets. Le professeur Scherer a mentionné une vaste étude menée auprès de 650 gestionnaires de R&D aux États-Unis par Richard Levin, aujourd'hui président de l'Université Yale et co-président du comité de la propriété intellectuelle de l'Académie nationale des sciences, qui a récemment publié un rapport sur le système d'enregistrement de brevets. En 1974, lorsque des données sur les sociétés sont devenues disponibles aux États-Unis, le professeur Scherer est revenu sur la question pour compléter ses données d'enquête et il a découvert que les sociétés qui avaient fait l'objet d'une concession de licence obligatoire consacraient à la R&D des sommes plus importantes, compte tenu e leur taille relative dans l'industrie, que les autres sociétés. Par conséquent, à son avis, il semble évident que la concession de licence obligatoire appliquée intelligemment en cas d'abus ou de monopole prolongé n'a tout simplement aucun effet défavorable.

Selon un délégué de la Suisse, la concession de licence obligatoire, en tant qu'approche générale, est perçue comme une mesure de dernier recours qui ne devrait être prise que si aucune autre n'est possible. Par exemple, toujours selon le délégué, la réforme de la législation régissant les brevets en Suisse prévoit une licence unique non exclusive pour les outils de recherche, car on croit que pour stimuler l'innovation, il faut tout spécialement ménager l'accès. Ce type de réglementation serait peut-être une solution plus approprié à ce problème épineux.

M. Lupin a ensuite souligné que le professeur Scherer avait peut-être été à l'essentiel de la question en indiquant que son issue dépend dans une très grande mesure des faits propres à chaque situation. Dans la plupart des cas présentés par Scherer, les entreprises investissant dans la R&D ne s'attendaient pas à ce que l'exploitation directecte du brevet par la concession de licences leur procure un rendement. Le rendement de la R&D était plutôt attendu sous d'autres formes, soit la création de nouveaux produits, la différenciation des produits, la réduction des coûts et ainsi de suite. On peut croire qu'en pareils cas, surtout lorsque d'autres comportements concurrentiels se manifestaient ou s'il s'agissait d'une fusion dont les effets étaient potentiellement contraignants, la concession de licence obligatoire pourrait fort bien constituer une solution appropriée. Dans le cas d'une entreprise qui s'attend à générer de bénéfices de l'exploitation de brevets, il faut agir avec beaucoup de circonspection avant d'imposer la concession obligatoire de licence.

Selon M. Lugard, l'élément le plus important de la concession obligatoire de licence pourrait être la raison de son imposition. Il peut y avoir des raisons statiques, soit que les titulaires éventuels de licences souhaitent fabriquer le même produit. En pareil cas, l'imposition de la concession obligatoire de licence n'est pas tant justifiée. Il peut aussi y avoir des raisons ayant un lien plus direct avec le progrès dynamique. Il faut alors davantage tenir compte des gains en efficience.

M. Lugard a avoué sa perplexité devant la relation entre les cas de concession de licence obligatoire aux États-Unis et la réaction des entreprises qui se l'était vu imposer. L'imposition de la concession obligatoire de licence peut ne pas ralentir immédiatement les efforts d'innovation des entreprises concernées, mais si le cadre réglementaire change de manière telle à modifier fondamentalement l'équilibre entre le droit de la propriété intellectuelle et le droit de la concurrence en ce sens que la concessions de licence obligatoire soit imposée nettement plus souvent, la position de plusieurs entreprises pourrait s'en trouver complètement différente. La réaction des entreprises confrontées à la concession obligatoire de licence de façon imprévue peut se révérer différente de celle qu'elles auraient dans un cadre réglementaire où la concession obligatoire de licence était chose nettement plus courante qu'elle ne l'est aujourd'hui.

Le professeur Scherer a considéré qu'il s'agissait d'une remarque très importante, car dans le cadre de l'étude réalisée à la Harvard Business School, des entrevues avaient pris place avec des entreprises ayant fait l'objet d'un décret de concession obligatoire de licence et d'autres qui pourraient se trouver menacés par la possibilité générale de se voir appliquer cette mesure. Dans certains cas, les entreprises étaient troublées mais se contentaient d'éviter toute pratique susceptible d'attirer l'attention des autorités antitrust. L'étude d'Harvard a constaté un effet généralisé de la concession obligatoire de licence, soit la tendance à maintenir davantage le secret et à se prévaloir des brevets à un moindre degré. Il est intéressant de noter que les statistiques montrent une plus grande incidence de cet effet chez les entreprises dont les brevets se rapportent davantage à des procédés. Comme il est plus facile de garder le secret sur un procédé plutôt que sur un produit, la réaction générale allait dans le sens de s'en remettre davantage au secret qu'aux brevets pour protéger les nouveaux procédés.

Le président a ensuite noté que la Finlande avait soulevé dans sa contribution un autre point d'intérêt potentiel pour les autorités en matière de concurrence. D'ordinaire, lorsqu'elles doivent examiner une pratique non concurrentielle, les autorités disposent d'indications relativement claires quant à l'existence ou non d'efficiences statiques en quantité suffisante pour que la pratique soit permise. S'agissant du progrès dynamique, toutefois, son existence n'est jamais assurée. Une pratique non concurrentielle ne devrait donc jamais être autorisée sur la foi de sa contribution au progrès dynamique car la norme de la preuve n'est pas respectée. La délégation finnoise a par conséquent proposé d'explorer les autres façons possibles, s'il en est, de résoudre la question.

Un délégué de la Finlande a expliqué que leur contribution s'attardait à la nature du défi que représente l'innovation en termes de conformité et de politique en matière de concurrence. D'abord, au vu de la littérature empirique et théorique, il est incontestable que le compromis entre le progrès dynamique et les efficiences statiques est dans l'ensemble très difficile à atteindre. Néanmoins, selon le secteur, la situation, le moment et les intervenants sur le marché, il peut être possible d'établir ce compromis.

La contribution finnoise a présenté le cas extrême où les parties se livrent à des activités d'innovation intenses, les activités d'innovation sont nécessairement liées à des conditions plutôt restrictives statiquement, l'importance des activités d'innovation fait bonne figure à côté des effets statiques et aucune autre situation ne semble pouvoir produire des résultats semblables ou meilleurs, sur le plan de l'innovation.

Que faut-il faire en pareille situation ? Les exposés et contributions donnent plusieurs exemples de ce type de situation ou de situations très analogues. D'abord, en l'absence d'innovation véritable, on parle de pratique d'exclusion ou de collusion et il n'y a de fait pas de problème en ce qui concerne l'innovation. Il se peut aussi qu'il n'y ait aucunes circonstances propres à l'innovation, de sorte que les conditions statiques pourraient être séparées de l'innovation. Enfin, l'innovation pourrait en effet être affectée. Par conséquent, il est possible d'éviter dans la plupart des cas de faire un compromis. La nécessité de

rassembler une preuve claire et convaincante est une autre possibilité. Si les effets statiques sont importants, l'argument du progrès dynamique n'a pas beaucoup de poids.

À quelle fréquence dont-on parvenir à un compromis ? Les normes ou les produits de la nature d'une plateforme viennent d'être mentionnés et soulèves des questions pertinentes quant au type de situation et à la fréquence.

Les décisions conditionnelles offrent des solutions en permettant aux parties de réaliser leur potentiel innovateur dans un délai raisonnable selon la nature de l'innovation. Ces décisions peuvent néanmoins retarder l'examen de l'état de l'innovation, ce qui peut mener à l'adoption subséquente de mesures notamment structurales si l'innovation ne s'est pas concrétisée. Le choix n'est pas facile, mais il faut se demander ce qui constituerait une preuve de la concrétisation et de la mise en œuvre de l'innovation. Les questions qui se posent concernent le type de situation, la durée de l'examen et la façon de corriger la situation par des conditions structurales s'il n'y a pas innovation. Ces questions sont ardues, mais ne peuvent être évacuées si l'on souhaite vraiment attaquer le problème du compromis.

Le président a ensuite donné la parole à la délégation des États-Unis.

Un délégué des États-Unis a mentionné la possibilité que la concession obligatoire de licence mine l'intérêt des entreprises rivales. Par exemple, l'entreprise A – occupant ou non une position dominante – possède un bien à l'égard duquel une concession de licence obligatoire est envisagée. En tenant pour acquis que l'un des objectifs primordiaux est d'encourager l'émergence de plusieurs nouveaux innovateurs, l'une des mesures les plus nuisibles serait de créer une incitation à ne pas innover. La concession de licence obligatoire a ceci de préoccupant, notamment, qu'elle a un effet corrosif sur l'intérêt des entreprises rivales. Elle suscitera un comportement pétitionnaire plutôt qu'innovateur, l'accès à un objet existant étant plus facile que les efforts nécessaires à l'innovation. Pour une entreprise qui tente de convaincre une agence publique qu'elle a désespérément besoin de la concession de licence obligatoire pour livrer concurrence, il serait dommageable que la preuve ou la presse révèle qu'en réalité, l'entreprise a investi de grands efforts et est sur le point d'arriver à une solution de rechange qui rendrait inutile la concession de licence obligatoire.

Aux États-Unis, les entreprises présentent souvent des requêtes aux bureaux de la concurrence, faisant valoir qu'elles ne peuvent d'aucune façon livrer concurrence sans accès à X. Les bureaux répondent qu'ils sont désolés, mais qu'ils n'ont constaté aucun effet non concurrentiel nuisible, et ne peuvent intervenir en l'absence de violation antitrust. Six mois plus tard, les entreprises sont toujours actives sur le marché et ont trouvé une solution de rechange. Ce n'est pas à dire que la concession de licence obligatoire n'a aucune utilité. Aux États-Unis, il y est souvent fait recours dans le cadre de fusions, par exemple, comme solution moins drastique que le déssaisissement. Mais il est très important pour les bureaux de la concurrence de garder à l'esprit la possibilité de bénéficier d'une concession de licence obligatoire à l'égard de la technologie d'un tiers a un effet corrosif sur l'intérêt des entreprises rivales.

Un délégué de l'Italie a ensuite adressé une question à la délégation des États-Unis. Tenant pour acquis que la propriété intellectuelle équivaut à tout autre propriété, comme le BIAC le suggère, existe-t-il des différences en ce qui concerne les infrastructures physiques et, le cas échéant, quelles sont-elles ?

Le délégué des États-Unis a répondu qu'il y a des différences en ce sens que les infrastructures physiques ne peuvent être utilisées que par une personne ou une entreprise à la fois. La propriété intellectuelle a ceci de particulier que le droit de l'utiliser peut être accordé à des dizaines d'entreprises. La question de savoir si un bien physique peut se voir appliquer un traitement antitrust différent dépend dans une certaine mesure du contexte, mais en général, les biens autres que la propriété intellectuelle sont

assortis de droits de propriété bien ancrés. Conformément à la législation antitrust des États-Unis, vous n'êtes pas tenus de partager vos biens corporels, à moins de choisir de le faire.

Un délégué de la Turquie a ensuite demandé si le BIAC pouvait appuyer sa position contre la concession de licence obligatoire sur une étude économétrique empirique.

Un délégué du Mexique a fait remarquer que l'Organisation mondiale du commerce a été le théâtre de débats vigoureux sur la concession de licence obligatoire. La question concernait la création d'un mécanisme visant à produire des médicaments accessibles aux pays pauvres qui ne disposaient pas de la capacité de production même en cas de concession obligatoire de licence. Ces débats n'ont abouti que sur une modification de l'Accord sur les aspects des droits de propriété intellectuelle qui touchent au commerce ou Accord sur les ADPIC. Le délégué a demandé si cette modification de l'Accord sur les ADPIC nuisait vraiment à la capacité de recherche et d'investissement des entreprises productrices de médicaments contre d'affections telles la malarie, la tuberculose et le SIDA/le VIH, particulièrement en Afrique.

Le BIAC a répondu que les règles de l'OMC concernant la propriété intellectuelle sont contenues dans l'Accord sur les ADPIC, qui obligent les membres de l'OMC à octroyer l'exclusivité aux détenteurs de brevets. Tout de suite après la disposition à cet effet, toutefois, les règles prévoient la possibilité d'imposer une concession de licence obligatoire sous réserve d'un certain nombre de conditions importantes. Certaines conditions ne sont pas applicables si la concession obligatoire de licence vise à redresser un comportement anticoncurrentiel. Par exemple, les règles générales concernant la concession de licence obligatoire prévoient qu'une entreprise qui souhaite obtenir ainsi une licence doit d'abord tenter de l'obtenir sur une base volontaire. Cette règle ne s'applique toutefois pas en cas de comportement anticoncurrentiel. En réponse à la question du Mexique, les règles de l'OMC ont été modifiées en 2003, modification confirmée en décembre 2005, pour faciliter l'accès des pays pauvres à la santé publique.

Le Président a ensuite affirmé que la question est plutôt de déterminer l'effet de la modification sur l'innovation et a sollicité les commentaires du professeur Scherer.

Le professeur Scherer s'est dit surpris que les entreprises demande au FTC d'imposer la concession de licence obligatoire pour entrer dans un domaine parce qu'elles n'ont pas fait de recherche. Il a eu connaissance personnelle d'un seul cas : le recours intenté par SCM contre Xerox. SCM ayant perdu sa cause, elle est intervenue dans la procédure devant le FTC. Le personnel de celui-ci a considéré que SCM agissait dans son intérêt personnel, tout simplement, puisqu'elle n'était pas active sur le marché et n'avait pas tenté de l'être. Le FTC a ignoré sa demande et considéré l'intérêt du public dans son ensemble.

Ensuite, quant à la différence entre les biens corporels et la propriété intellectuelle, Scherer recommande la lecture des écrits de Thomas Jefferson, le premier examinateur de brevets aux États-Unis. Pour Jefferson, il ne peut être question de biens s'agissant des inventions, les brevets étant totalement différents des biens corporels et ayant des fondements autres.

Enfin, la résolution de Doha et Cancun représente une solution de bon sens à un problème très sérieux. Il en été question dans plusieurs rencontres, notamment à la conférence entre l'OMC et l'OMS ayant eu lieu en Norvège en 2001. Scherer a rédigé un exposé dans lequel il ciblait le problème, qui a abouti à la modification de Doha et Cancun apportée à l'Accord sur les ADPIC.

Le Président a mentionné que la question du Mexique semblait comporter un autre volet, à savoir s'il existe une indication que cet affaiblissement des droits de propriété intellectuelle a donné lieu à une réduction des innovations des entreprises concernées.

Le professeur Scherer a indiqué que cette mesure a été mise en œuvre dans la plupart des cas par voie de négociation et que la concession de licence obligatoire n'avait pas été officiellement invoquée. Elle s'adresse principalement aux pays les moins développés, qui ne comptent que pour une infime partie des bénéfices des compagnies pharmaceutiques. Quel que soit l'effet produit, il est minime. Les marchés du tiers monde étant très faibles, le problème principal consiste à fournir des incitations à la recherche pour mettre au point des médicaments contre des maladies se manifestant dans le tiers monde. Avec ou sans système d'enregistrement des brevets, l'intérêt à investir dans la R&D n'est pas assez marqué. C'est pourquoi d'autres mécanismes ont été envisagés, par exemple les initiatives du G8 d'il y a environ neuf mois de développer des marchés garantis pour certins types de vaccins contre des maladies affectant le tiers monde et les interventions du type de celle de la Fondation Gates.

Le délégué du Mexique a ajouté que s'il s'agit d'un si petit marché n'ayant aucune incidence sur la R&D à l'échelle mondiale, il est incroyable qu'il ait fallu tant d'années à la communauté internationale pour trouver une solution à un problème capital pour une grande partie des populations des pays pauvres.

Le Président a résumé la première partie des débats, qui s'étaient ouverts sur l'idée que l'innovation est un objectif de société et se sont attardés à la question de savoir si la concurrence encourage l'innovation. Les participants ont discuté de la théorie de l'U inversé, arrivant à la conclusion que la rivalité est probablement le facteur dynamique qui facilite l'innovation. Dans la mesure où la politique et les règles de conformité en matière de concurrence ont pour effet d'augmenter la rivalité, les moyens utilisés ont été examinés, et ont s'est demandé si ces moyens ne nuisaient pas plutôt au régime de protection des droits de propriété intellectuelle. Tout au long du débat, l'hypothèse sous-jacente était que les droits de propriété intellectuelle sont bénéfiques à l'innovation.

2. Brevets, législation régissant les brevets Patents et innovation

Quels sont les différents aspects de la relation entre les droits de propriété intellectuelle et l'innovation ? Le président a ouvert la deuxième partie de la table ronde en demandant au professeur Hall d'effectuer un survol des questions pertinentes, particulièrement dans la mesure où des changements apportés aux systèmes d'enregistrement des brevets par certains pays membres de l'OCDE ont eu une incidence sur l'intensité de l'innovation.

Le professeur Hall a d'abord clarifié l'utilisation des termes « monopole » et « emprise sur le marché ». Ces termes décrivent simplement la situation où les prix sont supérieurs aux coûts marginaux. Les brevets ne créent pas des monopoles. Néanmoins, les entreprises demandent l'enregistrement de brevets dans l'esport d'avoir une emprise sur le marché. Dans un certain sens, c'est là l'objectif du système d'enregistrement des brevets, de sorte que le recours aux termes « monopole » et « emprise sur le marché » ne devrait pas forcément indiquer que les autorités antitrust doivent intervenir. Les brevets sont traditionnellement vus comme constituant une incitation à innover, mais ils ont le désavantage d'accorder aux entreprises une certaine emprise sur le marché à court terme. Dans certains secteurs, toutefois, plus particulièrement les secteurs normalisés où l'effet de réseau est important, l'emprise sur le marché se prolonger passablement à long terme, sauf si les brevets accélèrent le rythme de l'innovation.

On s'inquiète de plus en plus de l'effet potentiellement négatif des brevets sur l'innovation, spécialement en ce qui concerne l'innovation cumulative, où un produit donné fait l'objet de plusieurs brevets, mais les brevets peuvent aussi avoir un effet favorable sur la concurrence. Par exemple, les sociétés de capital risque reconnaissent qu'aux fins de l'investissement, la protection conférée par un brevet est le seul actif important de plusieurs entreprises de haute technologie possédant un capital de savoir.

La protection conférée par un brevet accorde pour un temps très limité un droit d'exclusion, en contrepartie de l'innovation et de la divulgation de l'invention concernée. Dans cette optique traditionnelle, les brevets sont favorables à l'innovation et défavorables à la concurrence, mais ils contribuent à celle-ci en facilitant l'entrée sur le marché. La présentation de Qualcomm était intriguante en ce sens qu'elle constituait un autre exemple de l'apport de la concurrence à la désintégration verticles des secteurs où le commerce de la technologie plutôt que celui des biens est la norme. Dans ce cas, la concession de licences à l'égard des inventions a créé une énorme industrie bénéfique pour l'ensemble de la société.

Dans l'hypothèse où Qualcomm n'aurait pu protéger sa technologie au moyen de brevets, elle serait sûrement devenue un important fabriquant intégré, fournisseur de téléphones portables, de services et de technologie en vue de protéger ses investissements. Dans ce cas, il y aurait eu innovation, mais peut-être moins rapide et la structure de l'industrie aurait vraisemblablement été différente.

La question de l'inhibition est difficile parce qu' « on ne voit pas un chien qui n'aboie pas ». Autrement dit, l'ampleur de l'innovation inhibée par l'existence d'obstacles constitués par des brevets est difficile à déterminer, car les inventeurs vont trouver des solutions de rechange plutôt que de se plaindre des difficultés qu'ils ont à recevoir des assurances qu'il n'y aura pas de contrefaçon.

Dans quels cas les brevets encouragent-ils l'innovation ? Sur le plan économique théorique, la question est toute simple : s'il existe un brevet par produit dans un monde statique, il est très clair que l'innovation sera encouragée. S'il existe un brevet par produit, mais qu'il se fonde sur une innovation antérieure, l'innovation sera encore une fois encouragée. Il pourrait toutefois être difficile d'obtenir une licence à l'égard de l'invention initiale de laquelle le nouveau produit s'inspire. L'établissement d'un prix adéquat sera malaisé, le résultat pouvant ne pas être optimal pour les entreprises et les consommateurs. Par exemple, le fabriquant d'un nouveau téléphone portable s'inspirera d'inventions antérieures, les siennes ou celles d'un tiers. Dans ce contexte et en présence de brevets plus solides ou en plus grand nombre, vu la facilité à les obtenir, y aura-t-il davantage d'innovation ? Le meilleur exposé à ce sujet est celui d'Eric Maskin et de Jim Bessen. Il montre que l'innovation n'est pas toujours favorisée en pareilles circonstances, et plus particulièrement si l'incertitude est grande si la composition du bassin d'inventions ressemble à celle qu'a décrite le professeur Scherer, soit beaucoup de brevets de peu de valeur et quelques brevets d'une très grande valeur. Si tels sont les résultats possibles, les brevets forts peuvent réduire les dépenses et l'innovation.

Voilà pour la théorie économique. Il est difficile d'obtenir des preuves économiques concrètes, car elles nécessitent la quantification et la mesure de l'innovation. La quantification des brevets n'est pas pertinente pour la question qui nous occupe. Quant à savoir si les brevets encouragent l'innovation, un changement des règles pour en faciliter l'obtention ou les consolider donne lieu à un plus grand nombre de brevets mais pas forcément à une innovation accrue.

À ce sujet, des études réalisées au 19ème siècle ont pour avantage d'examiner un ensemble de pays européens ainsi que les États-Unis et le Canada, dont certains étaient dotés de systèmes d'enregistrement des brevets et d'autres, comme la Suisse et les Pays-Bas, ne l'étaient pas. La durée des brevets, plus ou moins longue selon le pays, variait aussi considérablement. Ainsi, il était possible d'étudier la situation prévalant dans ces pays pour déterminer le rythme de l'innovation, compte tenu de la taille et d'autres facteurs, selon qu'ils étaient dotés d'un système de protection des brevets. D'après l'étude réalisée par Petre Moseron en 2005 sur l'exposition du Crystal Palace à Londre, en 1868, le degré d'innovation ne semblait pas varier beaucoup d'un pays à l'autre malgré l'existence d'un système d'enregistrement des brevets. Toutefois, le type d'innovation variait : dans les pays qui n'étaient pas dotés d'un tel système, l'innovation portait sur les secteurs et les technologies qui pouvaient être gardés secrets. Ces résultats ont été confirmés en 2001 par Lerner, qui s'était livré au même type d'exercice. Les démonstrations relatives

au 20ème siècle sont beaucoup plus pointues, mais une étude a conclu à l'effet favorable de l'octroi de brevets en matière de R&D.

Le professeur Hall et quatre co-auteurs ont récemment réalisé une série d'études portant sur l'évolution de la situation aux États-Unis pour les entreprises détentrices de brevets et celles qui n'en détiennent aucuns dans le domaine du matériel informatique et des logiciels. La division d'appel de la Cour de circuit, dans des décisions rendues en 1994 et 1995, s'était montrée en faveur de la délivrance de brevets à l'égard de logiciels, renversant les décisions du bureau des brevets et des marques de commerce des États-Unis. À cette époque, le bureau en question avait une politique d'endiguement, un peu comme celle de l'Office des brevets européen d'aujourd'hui. En fin de compte, le bureau des brevets et des marques de commerce a publié des lignes directrices relativement aux logiciels pouvant faire l'objet de brevets. Les brevets détenus par des entreprises sont ainsi devenus chose courante aux États-Unis.

Les chercheurs ont ensuite considéré l'effet produit sur les industries et les entreprises. D'abord, le rendement le cours sur le marché boursier sur une période de cinq jours pour les entreprises touchées par ces décisions est une preuve flagrante que les fabricants de logiciels, surtout de logiciels d'application, ont expérimenté des rendements négatives au cours de la période entourant les décisions. Le résultat n'a pas été considéré positif pour les fabricants de logiciels en aval. En amont, pour les fabricants de matériel, la situation n'a pas été considérée particulièrement négative car les brevets protégeant les logiciels n'occupaient pas une place importante dans leur entreprise. Toutefois, après 1995, la valeur des brevets sur les logiciels a clairement augmenté par rapport à celle des autres brevets pour les entreprises qui les détenaient. Les entreprises s'écartent en général des catégories de produits à l'égard desquels de nombreux brevets existent sur des logiciels. Mais une société qui détient certains de ces brevets est plus susceptible d'entrer sur ces marchés et moins encline à en sortir pour des raisons de survie et de viabilité

Des enquêtes à grande échelle menées auprès de gestionnaires de R&D aux États-Unis en 1983 et 1984 étaient semblables aux dernières quatre enquêtes menées dans l'Union européenne sur l'innovation de produits. Le professeur Hall a mentionné l'exposé d'Anthony Arundel de 2001. Cet exposé portait sur l'efficacité perçue de différents mécanismes visant à obtenir un rendement sur l'innovation. Il s'agissant notamment des brevets, du secret commercial, la longueur d'avance (soit l'avantage d'être le premier sur le marché) et des ventes aux consommateurs et du service offert à ceux-ci. La conclusion principale fut qu'en général, les entreprises considèrent que la longueur d'avance et la combinaison ventes/service sont plus importantes que les brevets ou le secret pour ce qui concerne le rendement de l'innovation. Il n'en demeure pas moins que 11 % des entreprises ont placé les brevets en premier ou en deuxième rang, et donc, il ne faut pas en conclure que les brevets n'ont aucune importance pour l'innovation. Il faut plutôt y voir une grande hétérogénéité parmi les entreprises et quant à la façon d'obtenir un rendement sur les innovations. Pour plusieurs segments du marché, les brevets sont assez importants. L'enquête Carnegie Mellon a révélé des données sensiblement identiques, sauf que le secret est devenu plus important.

En ce qui concerne les innovations, le message est principalement le même, sauf que les brevets sont moins importants. Ils sont passés au quatrième rang et le secret est un peu plus important, les procédés étant plus faciles à envelopper de la protection du secret. Les données dégagées par Arundel en 2001 révèlent que la longueur d'avance est la première façon dont les entreprises s'assurent d'un rendement sur l'innovation.

Quant aux secteurs pour lesquels les brevets comptent, le plus intéressé est celui des produits pharmaceutiques, suivi de ceux des plastiques, des produits chimiques, des instruments médicaux et parfois, la totalité ou certaines parties du secteur de la machinerie spécialisée. En Europe, les données n'étaient pas aussi catégoriques du fait que les rapports d'enquêtes ne couvraient pas les entreprises pharmaceutiques. Cependant, 40 % des entreprises de produits chimiques ont considéré les brevets comme leur meilleure façon d'obtenir un rendement sur l'innovation.

Ces résultats mettent en lumière une situation devenue courante. La simple constatation découlant de l'hétérogénéité est l'existence de technologies des produits distinctes et complexes. Cette constatation est sensiblement la même que pour certains autres secteurs. La biotechnologie, même s'il s'agit d'un segment de la pharmaceutique, possède certaines caractéritstiques qui commencent à ressembler à des produits complexes. Cette concordance peut être utile pour prédire si une entreprise sera pour ou contre certains changements à la politique en matière de brevets. En général, les brevets sont plus importants à des fins d'appropriation, assurant un rendement direct de l'innovation pour des secteurs de produits distincts. Les utilisations stratégiques des brevets dans le cadre de la concession de licences croisées et de négociations sont nettement plus importantes dans les secteurs des produits complexes. Il s'agit de secteurs dans lesquels chaque produit peut être assorti de plusieurs centaines de brevets alors que les produits des secteurs des produits distincts sont assortis d'un seul brevet ou d'un petit nombre de brevets, détenus principalement par l'entreprise qui fabrique les produits en question.

La conclusion tirée de l'ensemble des démonstrations est que le rôle des brevets pour encourager l'innovation est ambigü. Dans les secteurs des produits complexes, plusieurs entreprises ont une attitude réservée à l'égard des brevets. Néanmoins, une entreprise comme Qualcomm considérera que les brevets sont très importants pour les secteurs complexes, parce qu'elle est une entreprise de technologie. Ainsi, tout compte fait, la perception à l'égard des brevets est neutre ou négative, mais il est évident que certaines entreprises les perçoivent positivement. Le contexte est immensément hétérogène, les brevets pouvant de fait stimuler la concurrence s'ils facilitent l'entrée sur le marché ou l'avancement de la technologie par sauts.

L'application par les bureaux des brevets d'une norme uniforme de brevetabilité à tous les secteurs et toutes les technologies soulève une autre préoccupation. Si une analyse des coûts et bénéfices n'est pas requise, il n'y en aura ps. Les autorités en matière de concurrence, plus particulièrement dans ce domaine, s'en remettront entièrement à la règle de raison et chaque cas sera évalué différemment, selon partiellement une analyse économique des coûts et bénéfices. Les poliques en matière de concurrence et de brevets ne sont ainsi pas comparables, du moins pour le moment. De temps à autre, toutefois, le système d'enregistrement des brevets « unitaille » est remis en question, en termes de politique.

Pour faire sortir la politique en matière de brevets de cette conception « unitaille », la première tâche consiste à hausser le niveau. Une activité inventive plus intense et des exigences de non-évidence resserrées restreindront le nombre de brevets ainsi que le foisonnement. Le ratio bénéfices/coûts sera vraisemblablement augmenté par l'imposition d'une activité inventive plus intense. La perte est négligeable, plusieurs de ces brevets ne faisant qu'embrouiller la situation. Ce sont les brevets qui sont synonymes de changements importants pour les consommateurs et les entreprises qui ont une valeur. Si un produit est assorti de 400 brevets et que chacun de ces brevets est nécessaire à la production mais est détenu par un inventeur différent, il est impossible de dédommager les 400 inventeurs. Pour certaines entreprises, lorsqu'une petite partie de leur technologie est menacée, il est moins coûteux de régler. L'entreprise le fera même si elle considère que le brevet est invalide, car les coûts d'un litige seraient très élevés et aussi parce que le brevet est essentiel à ses activités. L'évaluation des dommages sur une base proportionnelle est l'une des façons de dissuader certains de ces comportements.

Le président a donné à l'Espagne l'occasion de poser ses questions.

Un délégué de l'Espagne a relevé le commentaire selon lequel lorsqu'une invention ne fait pas l'objet d'un examen approprié, elle peut constituer un frein sur le marché malgré l'absence de nouveauté ou d'activité inventive en raison du coût d'un litige. Comment alors les bureaux des brevets nationaux peuvent-il générer des revenus provenant d'honoraires ? La question n'est pertinente qu'en Europe – il se peut parfois qu'un bureau des brevets national accorde des brevets sans examen adéquat parce que les droits de renouvellement sont plus importants que les honoraires d'examen.

Le délégué a aussi demandé au professeur Hall si elle s'était penchée sur l'expansion du système européen d'enregistrement des brevets à de nouveaux domaines, par exemple, la biotechnologie et les logiciels, et le fait qu'elle peut être issue de la mise en commun des intérêts des bureaux des brevets.

Le professeur Hall a précisé que le problème des brevets faibles est que le détenteur du brevet peut demander une injonction provisoire pour l'ensemble de la valeur du produit. Même si le brevet semble invalide, le risque de perdre en cour peut être plus coûteux qu'un règlement.

Sur la question des honoraires du bureau des brevets, le professeur Hall a mentionné que les économistes sont généralement d'avis que les honoraires ne devraient pas être liés aux activités du bureau des brevets. Comme celui-ci agit dans l'intérêt du public, les honoraires ne sont pas forcément liés aux services fournis aux sociétés. Dans une perspective économique, les bureaux des brevets devraient fournir de bons services aux sociétés, mais le fait de recevoir des honoraires ne les contraint pas à satisfaire les volontés des sociétés.

Quant aux droits de renouvellement, qui sont normalement prélevés tous les quatre ans, il s'agit d'un outil de politique très utile pour assurer l'élimination de certains brevets. En général, les compagnies pharmaceutiques procèdent au renouvellement, car elles ont besoin de la durée totale pour récupérer leur investissement. Dans les secteurs en changement rapide, plusieurs inventeurs ne procèdent pas au renouvellement parce que le brevet ne mérite pas d'être respecté. L'une des façons d'atteindre au brevetage stratégique, c'est-à-dire d'enfoncer une grande quantité de brevets, est d'imposer des droits de renouvellement plutôt élevés après les cinq premières années, ce qui fait en somme verser très rapidement la technologie dans le domaine public. Dans certains cas, cet outil n'est pas utilisé de façon appropriée parce que les droits ne sont pas suffisamment élevés.

Pour ce qui est du système d'enregistrement des brevets en expansion, il s'est étendu aux logiciels et à la biotechnologie parque qu'il s'agit de marchés énormes générant de nombreuses inventions. La situation a évolué ainsi parce que les entreprises demandaient instamment la protection par brevets, et non pas parce que les bureaux des brevets cherchaient à générer des honoraires.

2.1 Quel effet les brevets et les régimes d'enregistrement des brevets ont-ils sur l'innovation ?

Le Président a donné la parole au Dr Guellec, qui a abordé trois sujets : l'explosion du nombre de brevets octroyés, les politiques favorables à l'octroi de brevets des années 1980 et 1990, et l'évaluation de certains effets sur l'innovation et l'économie en général.

Les demandes de brevets ont augmenté de près de 150 % au cours des 10 dernières années en Europe et d'environ 100 % aux États-Unis, ce qui marque la dernière décennie comme une période exceptionnelle. Non seulement le nombre de brevets a-t-il monté en flèche, mais aussi le volume des demandes mesuré en fonction de la quantité de revendications et du nombre de pages a augmenté de près de 50 % au cours des 10 dernières années. Plusieurs facteurs ont causé cette recrudescence, notamment l'augmentation du nombre d'inventions au sein d'une économie de savoir et l'incidence des marchés mondiaux, qui gonfle le nombre de brevets mondiaux. Les marchés sont plus concurrentiels. Par exemple, la dérèglementation et la privatisation des monopoles nationaux de la télécommunication ont eu un effet énorme sur l'industrie des brevets. La nouvelle organisation des industries et de la recherche ont également été décisifs ainsi que l'émergence d'un marché pour la technologie, les brevets faisant en quelque sorte office de monnaie d'échange sur ce marché. Les changements touchant la réglementation et la législation ont également eu une incidence. La politique dite favorable à l'octroi de brevets des quelque 10, 15 ou 20 dernières années a pris naissance aux États-Unis et s'est étendue progressivement à tous les pays membres de l'OCDE. Les mesures de renforcement des brevets comprennent la création de systèmes judiciaires pour trancher les

questions de propriété intellectuelle, par exemple le CAFC aux États-Unis et la Cour suprême en matière de propriété intellectuelle de Tokyo, au Japon.

Le deuxième type de changement est l'extension de l'objet à la technologie et au matériel génétique, qui sont d'abord devenus brevetables aux États-Unis, puis en Europe dans les années 1990. Les logiciels sont brevetables aux États-Unis. En Europe, certains logiciels sont brevetables, mais il y a tendance à augmenter progressivement les objets susceptibles d'être brevetés dans ce domaine. Un autre changement prend la forme des dommages-intérêts plus élevés accordés par les tribunaux. De plus, l'Accord sur les ADPIC favorise l'harmonisation en amont des droits protégés par brevet dans le monde entier. Enfin, les normes applicables à l'octroi des brevets, notamment l'activité inventive (ou le « critère de la non-évidence »), sont probablement devenues moins contraignantes ces quelque 10 à 20 dernières années. Dans le cadre d'une étude réalisée par l'OCDE il y a trois ans, on demandait aux entreprises s'il était plus facile aujourd'hui qu'il y a 10 ans d'obtenir un brevet aux États-Unis, en Europe et au Japon. La plupart des entreprises ont répondu que c'était plus facile qu'auparavant, encore plus en Europe et aux États-Unis.

Les bureaux des brevets, les avocats en brevets, les représentants auprès des bureaux des brevets et les employés chargés des brevets dans les entreprises forment une communauté, en quelque sorte, qui a contribué à ces changements sans trop d'examen de l'extérieur. C'est probablement pourquoi les autorités en matière de concurrence et le législateur portent maintenant leur attention sur ce secteur, car il est vraisemblablement de l'intérêt général que des représentants d'autres composantes de la société examinent le système.

L'augmentation du nombre de brevets est à son plus haut dans les domaines où l'invention est davantage présente, soit ceux de logiciels, de la technologie de l'information et de la biotechnologie. Mais au-delà de la stimulation des inventions, les brevets sont responsables de la réorganisation de ces industries permettant l'entrée sur scène de nouvelles entreprises spécialisées dans la recherche, comme c'est le cas notamment des industries des semi-conducteurs et de la biotechnologie. Sans brevets, ces entreprises de biotechnologie n'existeraient pas, la recherche serait effectuée par des laboratoires publics et des compagnies pharmaceutiques.

Quant aux critiques à l'endroit du renforcement du système d'enregistrement des brevets selon lesquelles les brevets rendent plus difficile l'accès aux réserves de recherche et plus coûteuse la recherche en aval, elles ne sont étayées d'aucune preuve empirique. Par exemple, selon deux enquêtes menées auprès de chercheurs, le pourcentage de chercheurs ayant répondu qu'ils avaient avorté un projet de recherche ou s'étaient abstenus d'en démarrer un parce qu'ils n'avaient pouvaient obtenir du matériel protégé par brevet se situait entre 1 % et 2 %.

Le Président a ensuite demandé au Dr Nicholaus Thumm de l'Institut suisse de la propriété intellectuelle de présenter son étude intitulée « Research and Patenting in Biotechnology – A survey in Switzerland ». Le Docteur Thumm a signalé que de nouvelles données provenant de l'Organisation Mondiale de la Propriété Intellectuelle indiquent qu'au cours des 10 dernières années, le nombre de brevets dans le monde a doublé. La question est la suivante : cette situation a-t-elle suscité plus d'innovation ? L'octroi de brevets a pour but de créer des incitations à la recherche et au développement en acceptant un petit recul de la concurrence. Il est toutefois plus important d'observer les pratiques plutôt que de s'en tenir à la théorie : les brevets sont après tout des outils commerciaux, et il faut donc en examiner l'utilisation.

De toutes les inventions, il est de notoriété publique que seules quelques unes aboutissent à des produits nouveaux. Du point de vue du consommateur, les inventions brevetées sont intéressantes si elles aboutissent à des innovations brevetées apportant de nouveaux produits sur le marché. Toutefois, d'un point de vue commercial, les inventions brevetées qui n'aboutissent pas à des innovations peuvent se révéler plus intéressantes, pour plusieurs raisons peut-être stratégiques, par exemple la détermination de

bloquer les concurrents ou simplement parce que le brevet est nécessaire pour libérer l'exploitation ou augmenter les revenus provenant de licences. Plusieurs raisons sous tendent les brevets de ce type, même s'il ne s'agit pas d'innovations.

L'Institut a commandé une enquête auprès de l'industrie de biotechnologie suisse, car elle est en voie de réformer la législation suisse régissant les brevets et souhaitait mieux comprendre les aspects économiques des brevets biotechnologiques et les problèmes concrets dans la pratique. L'enquête consistait en entretiens avec des intervenants comptant pour plus ou moins la moitié de l'industrie. La réponse surprenante à la question posée sur l'importance des brevets était que ceux-ci favorisaient la coopération avec les autres entreprises.

En ce qui concerne les autres outils possibles de protection, les brevets sont en effet très importants mais le secret l'est tout autant, ainsi que la longueur d'avance. Toutefois, dans la plupart des cas, les sociétés ont recours aux deux méthodes selon le type de technologie dont il s'agit. Lorsqu'on leur demande qu'elle est le pourcentage des inventions éventuellement brevetables qui ne sont pas brevetées, la réponse moyenne est 37 %, ce qui est assez élevé. Ces chiffres s'apparentent à ceux qui étaient ressortis d'autres enquêtes.

Le Dr Thumm a aussi fait remarquer que les données suisses n'étaient pas l'hypothèse de Schumpeter, puisque ce sont les petites entreprises qui innovent le plus en termes de brevets par employé et de R&D. Sous l'angle de la politique, on présume souvent que l'innovation est proportionnelle à la protection accordée. Mais ce n'est évidemment pas le cas. Ce qui compte pour le processus d'élaboration des politiques, comme en témoigne le modèle de l'U inversé, c'est qu'il existe une zone où une protection accrue conduira à une intensification de l'innovation et une autre zone où une protection accrue, par exemple le foisonnement des brevets, appauvrit l'innovation. Par conséquent, il faut déterminer si, dans la pratique, la tendance d'un côté ou de l'autre de ce degré optimal de protection.

La réforme de la législation régissant les brevets visent clairement la protection des inventions biotechnologiques qui, selon l'Institut suisse, présentent les besoins les plus importants. L'Institut s'est penché sur la possiblité d'exclure la brevetabilité pour des raisons d'ordre public et de moralité, par exemple, l'interdiction de l'octroi d'un brevet à l'égard d'un procédé de reproduction et thérapeutique visant à clôner l'être humain ou l'octroi d'un brevet à l'égard d'un code génétique. L'étendue de la protection des codes génétiques est un sujet constant de débats et l'exonération à des fins de recherche et d'utilisation expérimentale, les brevets concernant les outils de recherche et les essais diagnostiques ont également été examinés.

Il y a une certaine dépendance envers les brevets antérieurs, des difficultés se présentant pour entrer dans certains domaines technologiques, mais à un moindre degré. La deuxième enquête dans le domaine des essais génétiques a dégagé un peu plus de renseignements. On a demandé aux participants à l'enquête quelles mesures devraient être prises pour diminuer la dépendance envers les brevets antérieurs, réduire le coût des transactions, permettre une exploitation libre utilisant ces biotechnologies exclusives et promouvoir la dissémination de la technologie. Deux éléments se sont clairement dégagés : l'exonération générale aux fins de recherche et la protection offerte par une option de divulgation limitée attachée aux brevets concernant l'ADN.

En bref, il est courant qu'un composant chimique soit assorti d'un brevet, même s'il existe plusieurs utilisateurs. Il peut y avoir un nombre beaucoup plus élevé d'utilisateurs en ce qui concerne les gènes qui comprennent des protéines. Si le brevet à l'égard d'un gène pour une fonction précise est obtenu, il couvre aussi toutes les autres fonctions. Comme on a pensé que cette situation pourrait causer certains problèmes, la question de savoir si la protection dans ce cas devrait être limitée à la fonction donnée fait l'objet de débats constants. On croit que cette pratique aurait un effet favorable sur la R&D.

L'exonération aux fins de recherche se trouve maintenant dans le nouveau projet de loi sur les brevets et s'adresse à toutes les nouvelles connaissances se rapportant à l'objet susceptible d'être breveté, de même que l'exonération dite de Bolar, qui se traduit par l'inclusion des essais cliniques et des échantillons mais ne couvre pas la pré-production ni l'accumulation de médicaments avant l'expiration du brevet. Les exonérations ne visent pas les outils de recherche, comme il est expliqué ci-dessus, un permis étant prévu dans une disposition distince de la nouvelle réglementation. C'est le compromis pour lequel on a opté.

En résumé, des problèmes modérés d'accès affectent les brevets biotechnologiques. Les autorités suisses encouragent le recours aux outils offerts sur le marché et à divers types de mesures, par exemple celles qui sont prévues dans la nouvelle législation régissant les brevets.

Il est plus important pour l'intérêt public de promouvoir les brevets plutôt que le secret comme moyens de protection. Les inventions sont accessibles au grand public, ce qui donne au moins un accès potentiel à la technologie, tandis que les inventions protégées par le secret ne sont que du domaine de l'inventeur.

De l'avis du Président, il est très difficile de faire fi de l'idée qu'il existe une dimension sectorielle importante à toute cette question. La discussion devrait à un certain moment revenir au fait que, d'une part, les droits de propriété intellectuelle reçoivent sensiblement le même traitement dans l'ensemble des secteurs et d'autre part, que les autorités en matière de concurrence préfèrent une analyse individuelle tenant compte du secteur donné et des circonstances locales. Il semble donc que les autorités en matière de concurrence seraient justifiées d'appliquer des solutions différentes à des cas différents ; mais alors, le BIAC pourrait demander ce qui deviendrait de la prévisibilité. Des lignes directrices offriraient une solution possible et les efforts de ce côté commencent à porter fruits.

2.2 Quelle est l'importance des brevets par rapport aux autres modes de protection de l'investissement dans l'innovation ?

Le Président a demandé à David Simon de présenter l'innovation dans un monde sans brevets et les autres façons possibles de promouvoir l'innovation.

M. Simon a abordé le sujet des incitations à l'innovation autres que les brevets. L'une des clefs nécessaires à la compréhension du système d'enregistrement des brevets est que ces derniers constituent à plusieurs égards des outils probabilistes. D'abord, M. Simon relate que lorsqu'une entreprise détermine ce qui doit être breveté et l'endroit où ce doit l'être, il travaille avec une équipe de technologues pour établir l'endroit où la protection par brevet sera importante à l'avenir. Dans le secteur d'Intel, cet horizon est souvent d'au moins cinq ans ; cependant, rares sont ceux qui peuvent prévoir avec précision ce que sera l'avenir dans au moins cinq ans. L'une des histoires les plus notoires est celle de 3M, qui, il y a plusieurs années, a conçu une colle dont la qualité s'est révélée très mauvaise. Quelqu'un a eu l'idée d'appliquer cette colle au dos de papiers pour les coller à d'autres bouts de papier, donnant naissance aux autocollants de marque Post-it. Comme il s'agissait au départ d'une colle de mauvaise qualité, 3M n'a pas demandé qu'elle soit protégée par brevet, ce qu'elle a regretté, le produit ayant acquis beaucoup de valeur plusieurs années.

Au chapitre des probabilités, il faut aussi déterminer quel marché conviendra au produit. Par exemple, Intel avait un lecteur MP3 bien des années avant qu'Apple ne lance son Ipod, mais le produit d'Intel n'est pas bien connu parce qu'elle n'avait pas ciblé le bon marché au bon moment de la bonne façon. Néanmoins, le produit a été un bon élément du portefeuille de brevets d'Intel. Dans ce contexte, il devient évident qu'une quantité limitée de ressources peuvent être consacrée à l'obtention de brevets au sein d'une entreprise. La question est alors de savoir quels sont les meilleures et les pires sources de rendement sur les investissements. La réponse à cette question dépend de l'évaluation de l'orientation future des marchés et

du statut des régimes légaux à l'avenir. Comme on compare souvent cet exercice à un jeu de dards, en raison de l'incertitude entoutant les régimes politiques, les demandes de brevets ont grimpé en flèche, les études indiquant qu'il y entre beaucoup de chance et un peu d'aptitudes.

Ensuite, les entreprises évalueront les zones dans lesquelles elles sont susceptibles d'avoir le plus de chance, pour obtenir le meilleur rendement possible sur leur investissement, tenant compte des coûts des programmes de brevets qui peuvent se chiffrer au fil des ans à des dizaines de millions de dollars.

En ce qui concerne les autres formes de protection valables, même si les débats ne se sont pas beaucoup préoccupé des droits d'auteur, ceux-ci constituent certainement dans certaines une excellente façon d'assurer une protection. Dans d'autres domaines, particulièrement dans le secteur d'Intel, la possibilité de protéger l'aspect du design peut parfois se révéler critique à certains designs et à d'autres moments être complètement dénuée d'intérêt. Le secret et le moment de la percée sur le marché sont autant d'autres facteurs. Où placer ses paris ? Voilà une autre question à se poser. De plus, pour tous les portefeuilles de brevets, il faut se demander à quel moment ils sont assez garnis. Même si l'enregistrement d'un plus grand nombre de brevets présage d'une innovation accrue, M. Simon se demande s'il s'agit là d'un bon étalon de mesure de l'innovation. Le simple nombre de brevets peut être trompeur. D'un point de vue numérique, un volume critique est atteint lorsque le brevet suivant, en nombre, ne fait plus beaucoup de différence. Il faut pour chaque portefeuille évaluer la valeur cumulative, en termes aussi bien de qualité que de quantité. À un certain stade, lorsqu'une certaine quantité est acquise, l'entreprise présentera moins de demandes de brevets dans ce domaine. L'interprétation des données concernant des petites organisations peut en être biaisée, la croyance étant qu'ils détiennent plus de brevets par employé ; elles ne sont pas forcément plus ou moins innovatrices, elles peuvent simplement être en phase de croissance de leurs portefeuilles.

Essentiellement, une autre façon d'envisager la question, du moins dans le secteur d'Intel, qui est très différent de l'industrie des médicaments, est sous l'angle de l'investissement. Certains modèles utilisés par Intel ont pour objectif de l'aider à prendre ses décisions comme pour un portefeuille de placements, essentiellement comme pour un panier d'actions dans un fonds commun de placements.

Le Président a demandé aux Pays-Bas de présenter leurs conclusions quant aux raisons qu'ont les entreprises d'innover, autres que l'obtention de brevets.

Un délégué des Pays-Bas a expliqué que la loi néerlandaise sur les brevets permet de demander un brevet de 6 ans qui sera octroyé après une procédure légère ou un brevet de 20 ans qui nécessite une étude aux fins de renouvellement à l'expiration de 13 mois de la date de la demande. En moyenne, environ 1 800 demandes de brevets de 20 ans et 600 demandes de brevets de 6 ans sont présentées chaque année. La plupart des brevets se rapportent à des procédés et sont octroyés à des petites et moyennes entreprises et à des inventeurs, lesquels comptent pour plus de 50 % à 60 % de l'ensemble des demandes. Les grandes sociétés présentent d'ordinaire leurs demandes à l'échelle européenne. Une évaluation faite en 2006 de la loi sur les brevets a indiqué que les demandeurs étaient satisfaits de la législation régissant les brevets et aimaient particulièrement la durée relativement courte de la procédure, sa simplicité et son coût abordable.

Pour déterminer le comportement des entreprises en l'absence d'un système d'enregistrement des brevets, on a demandé aux entreprises d'indiquer quelles seraient leurs activités d'innovation si le système d'enregistrement des brevets venait à être aboli. Plus de 75 % des entreprises sollicitées ont répondu que leurs dépenses d'innovation ne changeraient pas. Quelque 15 % des entreprises sollicitées détentrices de brevets ont indiqué que leurs dépenses seraient réduites. Les entreprises sollicitées se composent principalement d'inventeurs et de PME néerlandais et les réponses concernaient pour la plupart des brevets à l'égard de procédés. Pour les entreprises des secteurs des produits chimiques et pharmaceutiques, les brevets européens constituent une importante incitation à l'innovation, comme le démontre une étude

réalisée en 2001 par le ministère des Affaires économique des Pays-Bas. Leurs investissements en R&D sont énormes et pavent la voie de l'avenir, et les brevets européens sont un moyen de recouvrer les coûts de leurs investissements. Ces entreprises disposent également d'instruments solides en droit civil, sont technologiquement avancée et profitent de longueurs d'avance et du secret. Il convient de noter que les Pays-Bas comptent surtout des entreprises de services, pour lesquelles les brevets ne constituent qu'une façon parmi d'autres de protéger leurs inventions. Les marques de commerce, les droits d'auteur et les droits des phyto-généticiens sont autant d'autres formes de protection. Les périodes de récupération des coûts, l'intensité de la R&D et le risque de destruction créatrice varient considérablement d'un secteur à l'autre. Par exemple, la difficulté de copier une machine à coudre est moins grande que celle de copier un médicament traité par ADN. Les facteurs énoncés ci-dessus, vus dans leur ensemble, peuvent expliquer la conclusion que les activités d'innovation seraient inchangées aux Pays-Bas en cas d'abolition du système national d'enregistrement des brevets.

Le ministère des Affaires économiques des Pays-Bas envisage d'effectuer plus tard des recherches sur la coopération entre les entreprises qui se livrent à des activités novatrices dans des secteurs différents, qu'on appelle aussi « innovation ouverte ». Citons comme example la coopération entre les entreprises de produits chimiques qui tiennent aux brevets et les entreprises manufacturières, pour lesquels ceux-ci comptent moins.

3. Discussion générale

Le Président a ouvert la discussion générale.

Le délégué de la Communauté européenne a pris la parole, soulignant que les professeurs Hall et Scherer avaient tous deux exploré la relation entre la propriété intellectuelle et l'innovation et fait valoir que les systèmes de protection de la propriété intellectuelle devraient être établis de façon sélective du point de vue de la concurrence. Dans la réalité, les systèmes d'enregistrement des brevets existent bel et bien et il faut espérer qu'ils soient développés en toute connaissance de cause. En ce qui concerne les remarques du professeur Hall sur la politique en matière de concurrence et d'innovation, la règle de raison en constitue le fondement. Bien entendu, le recours à la règle de raison pour la législation régissant la propriété intellectuelle conduit à une procédure d'analyse fondée sur les effets très ardue. Il semble essentiel que la conception des lois sur la propriété intellectuelle fasse l'objet de discussions où il sera tenu compte des effets potentiels, du moins dans l'ensemble, sur chaque secteur concerné. Il faut clairement énoncer que les préoccupations quant aux effets anticoncurrentiels ne sauraient l'emporter sur les avantages en termes d'incitations à innover, de bénéfices de l'innovation et de divulgation et de dissémination de l'information.

S'agissant de la politique en matière de concurrence, il convient de noter que certains facteurs non reliés à la législation régissant la propriété intellectuelle pourraient un jour faciliter l'innovation. Il est conclu dans le rapport de recherche de l'OCDE que la réglementation anticoncurrentielle sur le marché des produits compte six fois plus que certains autres facteurs pour déterminer le taux d'innovation. Le nouveau cadre d'assistance aux États de l'Union européenne encourageant les États membres à cibler des types précis d'innovation serait aussi pertinent.

Concernant le commentaire du professeur Hall au sujet de l'emprise sur le marché, le délégué de l'Union européenne a accepté le principe que les acquisitions sont intrinsèques à un marché concurrentiel, donnant lieu à une emprise plus importante sans être abusive. La détention de droits, comme l'a souligné le BIAC, ne confère pas d'emprise sur le marché ; c'est plutôt l'utilisation fructueuse de ces droits qui y parviendra. Néanmoins, il peut arriver que le détenteur de droits de propriété intellectuelle ait une emprise importante et durable sur le marché, même sur un marché saute mouton. En pareil cas, il est possible que dans un certain segment, une emprise importante sur le marché combinée à certaines pratiques d'utilisation

des brevets ou d'autres aspects de la législation régissant la propriété intellectuelle justifie, de façon exceptionnelle, une intervention antitrust. Le secret est source de complications supplémentaires. Dans plusieurs cas, les comportements demandés d'une entreprise dans l'intérêt d'une concurrence dynamique à long terme et du mieux-être des consommateurs peuvent ne pas être visés par la législation en matière de propriété intellectuelle ; il peut s'agir plutôt de secrets commerciaux. Par conséquent, les autorités en matière de concurrence, les entreprises et les avocats en propriété intellectuelle doivent se pencher sur la question des normes et de la protection devant entourer les secrets commerciaux.

Le délégué de la Turquie a ensuite demandé dans quelle mesure une réforme du système d'enregistrement des brevets se ferait en violation de conventions internationales contraignantes actuellement en vigueur.

M. Simon a répondu que plusieurs réformes peuvent être entreprises sans violer l'Accord sur les ADPIC. Par exemple, sans porter de jugement sur leur bien-fondé, la création de tribunaux spécialisés en matière de brevets au Japon ou aux États-Unis ne saurait équivaloir à une violation de cet accord. Un deuxième commentaire concernait la conformité ex post plutôt qu'ex ante. Dans un monde technologique en rapide évolution, les prévisions sont malaisées et les agences de conformité devraient tenir compte de cette incertitude quant à l'avenir.

M. Lupin a ensuite mis en garde la communauté internationale concernée par la concurrence : une application non judicieuse de la doctrine des facilités essentielles, combinée à des intentions de concession de licence obligatoire risque de soumettre la concession de licences de propriété intellectuelle à un règlementation des prix.

M. Lugard a conclu en faisant valoir une approche pragmatique de l'octroi des brevets et qu'il n'est pas possible d'instaurer un système unique pour tous les secteurs.

Pour ce faire, il faut suivre les activités commerciales et coopérer étroitement avec les autorités concernées en matière de concurrence. Dans la foulée du commentaire du professeur Hall, M. Lugard a proposé que le mémoire politique préparé à l'issue de la présente rencontre clarifie la différence entre la propriété de brevets et les monopoles relatifs à la propriété intellectuelle de façon à éliminer la confusion qui règne sur ce point, ce qui serait d'une grande aide à d'autres groupes de discussion et éviterait des débats inutiles.

En réponse à la question du président concernant une considération ex ante des problèmes de concurrence dans le domaine de la propriété intellectuelle, M. Lugard s'est dit d'avis que ce type d'intervention est très malaisé et que les autorités devraient s'en tenir à une considération ex post lorsque des problèmes se posent. M. Lugard a terminé en citant Frits Machlup, qui disait en 1958 que s'il n'existait aucun système d'enregistrement des brevets, il serait responsable, sur la base de la connaissance actuelle de ses conséquences économiques d'instituer un tel système. Mais comme nous en sommes dotés depuis fort longtemps, il serait irresponsable sur la base de nos connaissances actuelles de recommander de l'abolir.

Le Dr Guellec a indiqué que du point de vue de la politique publique, le système d'enregistrement des brevets a pour mission d'encourager l'innovation, voire la diffusion. Dans certains pays, les institutions chargées de gérer le système ont plus ou moins délaissé cet objectif. Par conséquent, il serait temps de rafraîchir la mémoire de toutes les institutions concernées par le système, mais aussi de procéder à des évaluations périodiques, comme c'est la tendance actuelle pour les organismes publics. Les bureaux des brevets devraient aussi être évalués périodiquement pour déterminer, sur la base de leur mandat, la mesure dans laquelle leurs activités contribuent à leur mission d'encourager l'innovation et la diffusion. Ce type d'exercices améliorerait la connaissance du système et encouragerait les bureaux des brevets à s'appliquer davantage à l'accomplissement de cette mission.

Quel peut être le rôle d'une autorité en matière de concurrence dans ce processus ? D'abord, il est important que les autorités en matière de concurrence collaborent étroitement avec les bureaux des brevets pour échanger des informations, éclairer les juges compétents en matière de brevets et informer les fonctionnaires du système d'enregistrement des brevets et d'autres intervenants des conséquences économiques des choix qui sont faits par le bureaux des brevets, même si ces choix ne devraient pas se fonder explicitement sur des dimensions économiques. Ces choix ont cependant des incidences économiques et les fonctionnaires de ces bureaux doivent en être conscients. Ensuite, et plus particulièrement en Europe, où le processus de demande de brevet est assorti d'une procédure dite d'opposition, un tiers peut demander au bureau des brevets de révoquer un brevet dans les neuf mois suivant son octroi. Du moins en Europe, les autorités en matière de concurrence pourraient être encouragées à se prévaloir de cette procédure si elles estiment que certains brevets nuiraient véritablement à la concurrence pour des raisons dénuées de légitimité au vu de la législation sur les brevets.

Scherer s'est d'abord reporté à une remarque de Robert Solow faite à une conférence récente tenue en mémoire de l'économiste John Kenneth Galbraith qu'il ne faut pas craindre de devoir de temps à autre donner un prix à quelque chose du genre de la concession obligatoire de licence. C'était aussi l'opinion de Galbraith. Le professeur Scherer a ensuite précisé qu'il existe à l'heure actuelle deux théories totalement différentes du rôle des brevets en tant qu'incitations à l'investissement technologique. Il y a la théorie dite de l'innovation fondée sur les attentes, rendue populaire par Edmond Kitsch mais fondée en réalité sur l'analyse précurseure faite par William Nordhaus de la durée optimale d'un brevet. Il y a ensuite la théorie moins connue de la « quête de loyers » selon laquelle les entreprises se livrent concurrence pour le monopole des brevets et dans la foulée, épuisent la plupart des loyers que le monopole d'un brevet peut générer. À une conférence commanditée par l'Univertité Western Ontario il y a quelque 20 ans, une comparaison de ces théories a montré que l'application de la théorie de Nordhaus dite des attentes aboutit à une durée de vie optimale des brevets de 20 ans. Selon la théorie de la quête des loyers, la durée de vie optimale des brevets varie entre un an et demie et deux ans. Les conséquences politiques en découlant, qui sont tributaires d'un phénomène très subtil d'abord théorique puis empirique, sont très différentes.

Le professeur Hall a ensuite précisé que l'énoncé de 1958 de Fritz Machlup avait été fait dans le cadre de l'examen par le Congrès américain d'une réforme des brevets. Edith Penrose, une étudiante de Machlup, affirmait en 1951 que si la législation nationale sur les brevets n'existait pas, il serait difficile de justifier son adoption. Mais le fait qu'elle existe déplace la charge de la preuve et il est tout aussi difficile d'en justifier l'abolition.

Le professeur Hall a fait deux commentaires sur les remarques de M. Simon. La première concernait les droits de renouvellement : vu l'incertitude, au cours des premières cinq années, qu'une valeur s'attachera à un brevet, les droits de renouvellement sont en général abordables comparativement aux droits de demande. Après les cinq premières années, les droits de renouvellement sont augmentés, l'incertitude étant en grande partie résolue au cours de cette période initiale.

Quant à la question de l'opposition des petites et des grandes entreprises, on a souvent entendu que les petites entreprises produisent un plus grand nombre de brevets que les grandes entreprises. Ce lien ne ressort toutefois pas clairement de l'examen de l'ensemble de l'économie des États-Unis. Le graphique qui avait été présenté particulièrement pour le secteur biotechnologique doit être interprété avec précaution, car les petites entreprises de biotechnologie font de la recherche aboutissant à des brevets. Quant aux dépenses de R&D des grandes entreprises de biotechnologie, certaines d'entre elles étant en phase de production ou du moins de développement, elles reflètent une composition très différente d'activités. Par exemple, pour les compagnies pharmaceutiques, les efforts de développement aboutissent à des produits et non à des brevets. Le même raisonnement peut s'appliquer aux autres secteurs. Il faut donc être très prudent avant de faire cette distinction. Comme les activités des petites et des grandes entreprises d'un même secteur sont

différentes, il est très dangereux de conclure que les petites entreprises sont forcément plus innovantes, même s'il est vrai que ce sont les petites entreprises qui ont d'ordinaire les idées vraiment radicales.

Au sujet de la règle de raison, le professeur Hall a précisé qu'elle ne voulait pas laisser entendre qu'il s'agirait d'une bonne idée, mais qu'elle soulève une énigme sur laquelle il est intéressant de se pencher. Bien entendu, elle implique d'abord que les autorités en matière de concurrence portent une attention assez particulière aux systèmes d'enregistrement des brevets et à l'utilisation qui en est faite. Il n'est pas raisonable de s'attendre à ce qu'un pareil système évalue essentiellement chaque brevet pour en déterminer l'effet anticoncurrentiel ou proconcurrentiel.

Pour ce qui est de la question de l'opposition des théories que le professeur Scherer appelle « théorie des attentes » et « théorie de la quête de loyers », le professeur Hall y voit l'argument selon lequel « la concurrence engendre trop d'innovation », qui équivaut en réalité à la théorie de la quête des loyers. L'affaire avec les théories économiques dans ce domaine, c'est qu'il y aura toujours un théoricien pour trouver la réponse souhaitée étayées par certaines hypothèses. Par conséquent, le professeur Hall s'en remet principalement à des démonstrations empiriques. Il est très rare que la concurrence engendre trop d'innovation. L'exemple clé est issu du secteur pharmaceutique. Le prochain Viagra sera extrêmement profitable à l'entreprise qui l'inventera et agréera le brevet qui lui permettra de fabriquer un produit légèrement meilleur, mais le sera très peu au public. Peut-être alors a-t-on trop dépensé en R&D. Mais en général, comme l'a laissé entendre le professeur Scherer, les façons d'innover sont tellement variées que les entreprises n'adoptent pas vraiment la même stratégie.

S'agissant des conventions internationales et des réformes des régimes de brevets, la plupart des réformes dont il a été question, du moins aux États-Unis, ne généreront aucun conflit avec les conventions internationales ; de fait, la bonne nouvelle, c'est qu'elles pourraient permettre aux États-Unis de se conformer à ces conventions, plus particulièrement en ce qui concerne la première personne à déposer. Il reste néanmoins une zone d'ambiguïté dans la mesure où l'Accord sur le ADPIC permet assez clairement de brever à peu près n'importe quelle invention. Des restrictions quant à l'objet susceptible d'être breveté peuvent par conséquent nécessiter la réouverture de cet accord.

En conclusion, le Président a fait un bref retour sur l'idée de solidité et de prévisibilité mise de l'avant par le BIAC et aux premières étapes du débat lorsque le délégué du Royaume-Uni a mentionné deux développements depuis la dernière table ronde sur les brevets et la concurrence, soit la relation en U inversé et la différenciation des types d'innovations, par exemple, l'innovation saute-mouton par opposition à l'innovation par processus continu. D'abord, nous avons découvert grâce à l'une des présentations l'existence possible d'un autre type de relation en U inversé entre l'innovation et les brevets ou la solidité des brevets. Il est pertinent de se demander si une protection excessive réduira l'innovation.

La discussion a aussi révélé que plusieurs autres variables déterminent la perception des brevets et l'établissement de la politique en matière de brevets, les résultats étant très différents selon les circonstances et à cet égard, une topologie des secteurs et des situations a été présentée.

L'importance d'un système de protection des droits de propriété intellectuelle prévisible est généralement reconnue. Il est moins unanime qu'un système de protection des droits de propriété intellectuelle très fort, qui excluerait l'intervention des autorités en matières de concurrence, soit souhaitable. Comme ces autorités procèdent actuellement au cas par cas, la rédaction de lignes directrice pourrait rendre plus prévisible l'application par elles des droits de propriété intellectuelle. Mais ces lignes directrices devraient tenir compte du fait que les circonstances particulières et le contexte sont d'importants facteurs pour déterminer le traitement à réserver aux brevets et les pratiques. Par exemple, comme on l'a déjà vu, la distinction entre procédé et produit peut être importante dans certains secteurs. Par conséquent, lorsqu'il est question de permettre une fusion, et peut-être dans d'autres cas, une conception différente du

compromis entre concurrence et droits de propriété intellectuelle peut être adoptée. Les bureaux des brevets nationaux ne contribuent pas beaucoup à cette analyse dans la mesure où ils tendent à adopter une approche uniforme.

Trois contributions ont de fait abordé cette question, mais n'ont pas été débattues faute de temps, soit celles du Taipei chinois, des Etats-Unis et du Danemark. Le Taipei chinois a conclu que les autorités en matière de concurrence et les droits de propriété intellectuelle n'étaient pas reliés. Les Etats-Unis et le Danemark ont indiqué qu'ils avaient commencé à dialoguer mais dans les deux cas, l'échange n'aurait pas porté beaucoup sur la différenciation selon les types de secteurs ou d'innovations ou selon les circonstances. La discussion a plutôt été centrée sur le caractère éventuellement excessif de la protection des droits de propriété intellectuelle. Peut-être y-a-t-il lieu de promouvoir la coopération entre autorités en matière de concurrence pour établir des lignes directrices sur leur perception du rôle des brevets dans des circonstances différentes.