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Market Power*

Assessment of Market Power in Competition Matters

Prepared for the
Federal Competition Commission of Mexico

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1. Introduction

This report was commissioned as a reference paper by the Federal Competition Commission (CFC or Commission) for the purposes of describing best international practices, international cases and investigations, and the current and prevailing technical approaches used in the analysis and assessment of market power.[2]

In the US, EU, and other jurisdictions, a finding of market power is required in cases involving allegations of anticompetitive acts that are not illegal per se.[3] The requirement of substantial market power for finding business practices to be anticompetitive relates to the existing level of market power in the absence of the conduct at issue (e.g., a potentially anticompetitive business practice or a merger). In addition, the change in the level of market power resulting from the conduct can be a critical part of the inquiry, particularly in the case of mergers or other concentrations. The change in market power from the conduct, after accounting for the efficiencies associated with the conduct, is ultimately what matters for assessing the competitive impact of the practice. For assessing potentially anticompetitive business practices, however, the existing level of market power is the starting point because it serves as an important screen for situations in which competitive harm is unlikely because firms lack market power.

Market power is commonly defined as the ability of a firm (or group of firms) to raise prices significantly above the competitive level, although there is no consensus on exactly how much above the competitive level constitutes significant market power.[4] The competitive level is generally taken to be the price that would prevail under perfect competition, so that price is set at marginal cost.[5]

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2 This report presents our survey of the current prevailing international approaches for assessing market power. We do not necessarily agree with every approach and technique discussed in this report. We also note that a complete analysis of any particular competition policy issue (of which market power is a part) may often depend on the type of practice at issue and the relevant facts. This report gives a general overview of the assessment of market power, and there are likely particular competition policy cases that raise issues that are beyond the scope of this report.

3 For the purposes of this report, our discussion of potentially anticompetitive business practices refers to those that are not per se illegal.

4 For convenience, we will generally refer to "firm" in this report, but our discussion generally extends to cases where the market power of a group of firms is at issue.

5 Phillip E. Areeda and Herbert Hovenkamp, Antitrust Law (New York, NY: Aspen Law and Business, 2002), Volume IIA at ¶501; Massimo Motta, Competition Policy—Theory and Practice (Cambridge, UK: Cambridge University Press, 2004), p. 115; Einer Elhauge and Damien Geradin Global Competition Law and Economics (Portland, OR: Hart Publishing, 2007), p. 238. In the EU, dominance has also been defined as holding "a position of economic strength enjoyed by an undertaking which enables it to prevent effective

(footnote continued)

This is the standard starting point although, as we will discuss, there are significant issues with using perfect competition, and with using marginal cost, as the benchmark in many circumstances. A firm with substantial market power may choose to exercise that market power through means other than raising prices, so the ability of a firm to operate in other ways—such as in contractual restrictions it imposes—to a significant extent outside of the constraints of competitive forces is also often included in the description of, and assessment of, market power.

This report provides a framework for evaluating the existence of market power, describes the tools that can be used for collecting and analyzing evidence on market power, and discusses practical issues that arise in applying the framework and tools to actual cases.[6] Roughly speaking, there are three broad approaches to assessing the level of market power. First, and probably most commonly, courts and competition authorities have relied on level of a firm's share within a relevant market that has been determined through a separate inquiry.[7] If a firm has a small share of a well-defined relevant market, it is highly unlikely to have substantial market power. Second, quantitative measures of a firm's pricing power are often used, such as its price-cost margins or its profitability over time. If a firm is unable to maintain prices significantly above costs, it is unlikely to have substantial market power. And third, evidence of various sorts on the potential actions of the firm under investigation and of its competitors and consumers are also considered. In particular, if entry is sufficiently easy then it is unlikely that any firm will have significant market power.

None of these three broad types of inquiry can be implemented mechanically and lead to reliable answers. Each much be undertaken with careful consideration to avoid false findings of the presence or absence of significant market power. In practice, a combination of all these approaches is commonly employed in any given matter. The more consistent the picture painted by these three approaches, the more confident the authorities can be in the presence or absence of significant market power. Despite the lack of a single clear framework for assessing market power, there is, as a general matter, a

competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, customers and ultimately of its consumers". See Case 27/76, United Brands Company and United Brands Continetaal BV v. European Commission, 1978 E.C.R. (1978).

6 The issue of efficiencies, which are a critical element of assessing whether the conduct at issue is on balance anticompetitive, is outside the scope of this report.

7 For a discussion of market definition, see Howard Chang, David Evans, and Richard Schmalensee, Market Definition: Assessment of Market Power in Competition Matters, Prepared for the Federal Competition Commission of Mexico, March 2010 (hereinafter "Market Definition Report").

consensus among antitrust practitioners regarding the strengths and weaknesses of these approaches.

This report is designed to serve two purposes. It is intended to provide the Federal Competition Commission (CFC or Commission) with a description of the prevailing international practices for assessing market power. It is also intended to provide businesses (and their legal advisors) guidance on how competition authorities generally analyze market power for the purposes of assessing the legality of practices or consolidations that businesses might be engaged in or contemplating.

2. Market Power

2.1 Role of market power inquiry

The assessment of market power is a critical element of the application of any conduct investigation and the analysis of mergers and acquisitions. For business practices that may but do not always improperly displace other firms from the market, substantially hinder the access of other firms to the market, or establish exclusive advantages in favor of certain firms or economic agents—there is an explicit requirement under many laws to show that the firm or firms under investigation have substantial market power in the relevant market. This serves as an important screening mechanism given an error cost approach to competition policy enforcement.

Firms without significant market power are unlikely to harm competition, especially for the types of business practices covered under relative monopolistic practices. Similarly, consolidations that do not significantly enhance market power are unlikely to harm competition. Since an inquiry into challenged business practices can be subject to significant error, agency resource management and business planning are both enhanced if a threshold showing that a firm has substantial market power is required before business practices are challenged.[8] An error cost approach is also consistent with the lack of a market power requirement for absolute monopolistic practices, which are deemed to have such limited procompetitive value that there is little to be lost from preventing their use even by firms without significant market power.

8 In practice, procompetitive or benign business practices sometimes face significant opposition from competitors or subsets of customers.

For a merger or acquisition to be found anticompetitive, competition authorities generally focus on the ability and incentive of the post-merger firm to raise prices or otherwise harm consumers. This inquiry depends critically on the acquisition of market power as a result of the merger, as well as on potentially offsetting efficiencies that would provide incentives for price reductions. Since preventing a merger does not foreclose increasing scale or scope through internal growth, an error cost approach is consistent with the general practice of blocking proposed mergers that would produce something less than substantial market power.

In assessing whether a business practice is anticompetitive (after meeting the threshold requirement of substantial market power), the relevant question is whether the practice significantly increases market power. In discussing the assessment of market power, it is therefore important to distinguish between the prevailing level of market power in the absence of the conduct at issue (i.e., a potentially anticompetitive business practice or a merger) and the change in the level of market power resulting from the conduct.

2.2 Definition of Market Power

Market power is commonly defined by commentators as the ability of a firm (or group of firms) to raise prices significantly above perfectly competitive levels; most then add that almost all firms have some market power, though substantial market power is uncommon. In the US, the Supreme Court has defined "monopoly power" as "the power to control prices or exclude competition."[9] The term "monopoly power" is the standard term used in the US case law to refer to the threshold degree of market power below which a firm would not be subject to an inquiry as to whether its unilateral conduct is anticompetitive.[10] Monopoly power as it is used in the US does not require a firm to be a literal monopolist with no competitors. Its use is equivalent to a significant or substantial degree of market power.

9 See Eastman Kodak Co. v. Image Tech. Servs., 504 U.S. 451, 481 (1992); United States v. du Pont & Co., 351 U.S. 377, 391 (1956).

10 A lesser degree of market power is still required in attempted monopolization cases in the US. Proof of market power can also be required rule of reason cases, concerning practices that are not illegal per se, in the US. See William M. Landes and Richard A. Posner, "Market Power in Antitrust Cases," Harvard Law Review 94, p. 937 (1981) [hereinafter, "Market Power in Antitrust"]; Louis Kaplow and Carl Shapiro, "Antitrust," Handbook of Law and Economics, edited by A. Mitchell Polinsky and Steven Shavell (Amsterdam: North Holland, 2007) Vol. 2, Chapter 15, Section 2.5 [hereinafter, "Antitrust"].

In the EU, the term "dominant position" is used to refer to the threshold level of market power for unilateral conduct inquiries and is defined in the case law to be "a position of economic strength enjoyed by an undertaking, which enables it to prevent effective competition being maintained on the relevant market by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of the consumers."[11] This definition includes the power to set prices independently of competition as well as, like the US definition, the power to use that market power in areas other than pricing, such as by imposing contractual conditions or degrading product or service quality. As in the US, the term dominant position has come to mean having significant or substantial market power.

In defining market power, it is important to recognize that most businesses have some degree of power over price. Relatively few real world markets consist of firms that are price takers selling products that are completely interchangeable with those of their many, small competitors. In the US, EU and many other jurisdictions—there is a requirement that the degree of market power be substantial as a threshold condition before a full assessment of competitive effects of a business practice is necessary. There is, however, no generally agreed standard in the US or EU regarding how much pricing power constitutes substantial market power.[12]

2.3 Definition of the Competitive Level

As noted above, market power is defined as the ability to increase price from the competitive level, rather than from the prevailing price level. This distinction is important. A firm facing intense competition will set its price so that further price increases will be unprofitable, but so will a monopolist. We would therefore expect to observe that firms are unable to profitably increase prices from current levels—otherwise they would not be behaving rationally—and the fact that a firm cannot further increase its prices tells us nothing about whether it has significant market power.[13] If we want to assess whether firms possess significant market power, we must therefore consider what the competitive level of prices would be.

11 Case 85/76 Hoffmann-La Roche & Co. AG v. European Commission (1979).

12 The terms "substantial" and "significant" are commonly used interchangeably in the literature and we do so here as well.

13 This is commonly referred to as the "Cellophane Fallacy" after a US Supreme Court case in which Du Pont, by far the leading producer of cellophane in the US, was found not to have market power because

(footnote continued)

The next question is naturally what do we mean by the competitive level? The standard textbook approach is to use "perfect competition" as the reference point. The core characteristics of a perfectly competitive market in economic theory include: all sellers offer a homogeneous good; perfect information about the market including price and quantity; price taking because no individual buyer or seller can influence prices; no transactions costs; and entry and exit are costless.[14] Under textbook perfect competition, the equilibrium price in a given market will be the short-run and long-run marginal cost of production, and no individual firm is able to raise its price from that level.

While this benchmark is well-defined, however, it does not seem appropriate as a literal benchmark for competition policy. In many sectors, price will deviate from marginal cost, particularly short-run marginal cost even under the most competitive feasible performance. Restaurants and many other firms sell differentiated products that are viewed as imperfect substitutes by consumers. Because substitutes are imperfect, these firms have market power in the sense that they can raise prices above marginal cost, which they must be able to do in order to cover their fixed costs of facilities and staff and stay in business. Moreover, in such markets, new firms can often readily enter and drive economic profits down to zero.[15]

Similarly, videogame producers must sell their games for prices well above marginal cost if they are to cover the fixed cost of developing both successful and unsuccessful games. Automobile firms must attain large scale in order to produce at competitive costs; a world in which there are many price-taking auto companies would be a world with very expensive cars. Generally, whenever businesses have significant fixed costs or economies of scale, long-run average cost will exceed short-run marginal cost, and firms must charge prices in excess of short-run marginal cost to break even. Not surprisingly, a survey of US

there was substitution with other products at the prevailing monopoly prices. See United States v. du Pont & Co., 351 U.S. 377 (1956).

14 In addition, there is a technical requirement that there is perfect divisibility of output so that firms can produce and consumers can purchase very small amounts of a product. Dennis W. Carlton and Jeffrey M. Perloff, Modern Industrial Organization, 4th ed. (Boston: Addison-Wesley, 2005), 57.

15 This suggests the possibility of using excess profits as another measure of market power. As we discuss below, there are also significant difficulties with using this approach. Markets in which products are differentiated but easy entry eliminates long-run excess profits are generally termed "monopolistically competitive."

industries found "a large gap [between price and marginal cost] in many industries."[16]

In fact, few markets could in fact look anything like perfectly competitive markets and serve consumers well. Even if there were no leading firm with an extremely large share, we would not expect these markets to resemble textbook perfect competition. For these reasons, it is doubtful that the textbook ideal of perfect competition—and the resulting implication that competitive prices should be set at marginal cost—could be used with any degree of rigor as the reference benchmark in assessing market power as a general matter.

As we noted, it is important keep in mind that market power must be assessed relative to some competitive benchmark, otherwise the market power inquiry will be seriously flawed as even monopolists face competitive constraints when they set monopoly prices. But we would also caution against a strict application of textbook perfect competition as a benchmark. It is more appropriate to ask what the best feasible market structure and firm behavior would be from the point of view of consumers and use the answer as a benchmark. It is generally impossible to specify this ideal with precision, but approaching the problem this way avoids more subtle versions of the error of concluding that all restaurants have substantial market power because they price meals well above the marginal cost of ingredients.

2.4 Analytic Approaches

To evaluate the extent to which a firm is subject to competitive constraints, there are three broad categories of approaches. The first is to define a relevant market (or markets) and assess the shares observed within that market. High shares, above a threshold level, are taken to be evidence of market power. This approach may be the most routinely used in practice. It is rare that an investigation would not have at least a discussion of potential relevant markets and the shares within those markets. We must be cautious, however, of drawing strong conclusions from high shares—market definition is inherently an imprecise exercise and, even if the relevant market is defined appropriately, high shares may not correspond to significant market power. The market-share approach is perhaps most useful in signaling the absence of substantial market power when

16 Robert E. Hall, "The Relation between Price and Marginal Cost in U.S. Industry," The Journal of Political Economy 96, no. 5 (1988): 921-947.

shares are low and establishing a rebuttable presumption of such power when shares of a well-defined market are high.

Second, given the definition of market power as the power to raise prices above the competitive level, and given that prices are readily observable and measures of costs, such as those from accounting and financial reports, are generally available, it is natural to ask whether we can simply compare prices to costs. As we discuss later, there are significant practical and conceptual problems in doing so. Other related attempts to directly estimate market power rely on measure of profitability and elasticities.

The third broad category of analysis looks at evidence on competitive constraints. On the demand side, this would include an assessment of the functional interchangeability of competing products, evidence from company records and industry analysts on customer substitution, and potentially customer surveys conducted for the purpose of the investigation. On the supply side, this would include an analysis of the extent to which, in response to increases in a firm's price, other firms could switch capacity from closely related products, reposition products in differentiated markets to compete more directly, and whether there are significant barriers to entry by new firms.

None of these three broad categories of analyses, taken alone, is likely determinative except in extremely straightforward cases. Typically, all available evidence from each category of analysis is reviewed in assessing market power. For example, suppose a firm has a high share in the defined relevant market. If that firm does not appear to earn persistently high economic profits, if its share has not been stable over time, and if it behaves as if subject to substantial competitive forces (e.g., by investing heavily in new product development), then those factors should cast significant doubt on the probative value of the high market share. All three types of analysis ultimately address the extent to which a firm faces competitive constraints, in its pricing and other decisions, which we discuss in Section 3. We then discuss the analytic approaches themselves in Section 4.

2.5 Level of Market Power Versus Change in Market Power

As we noted, in assessing market power it is useful to distinguish between assessments of the level of market power versus the change in market power. In general, the approaches and types of evidence relevant to one inquiry will also be useful to the other inquiry. For example, if a firm faces significant competitive constraints that prevent it from significantly raising prices above the competitive level, those same constraints will likely prevent the firm from engaging in

practices that are harmful to competition—that is why the level of market power is used as a screen for assessing potentially anticompetitive acts. Similarly, if two firms that plan to merge each face significant competitive constraints so that neither has significant market power, those same competitive constraints will be useful for assessing the degree to which the merger increases the market power of the remaining firm post-merger. Firms that have limited market power pre-merger may still significantly increase their market power as a result of the merger because the competitive constraints they impose on each other are removed.

It is, however, important to keep in mind that while the assessment of whether there is a significant level of existing market power and of whether there is a significant change in market power are related, answering one question does not answer the other. In the merger context, a common approach is to directly assess the extent to which the parties constrain each other's pricing. If the constraint is significant, then the merger would likely raise prices, in the absence of countervailing efficiency benefits. A decision can be made regarding the merger without reaching a full conclusion about the level of market power held by the parties pre-merger (or a full conclusion about the relevant market). And in fact the pre-merger market power is largely irrelevant—neither firm could have market power but the merger results in market power, and either firm could have market power but the combination doesn't necessarily increase it.

Similarly, for a potentially anticompetitive act, if the market power threshold has been met, the question then turns to whether the practice in question had an anticompetitive effect by increasing the market power of firm under investigation (or, perhaps, enabling it to increase its ability to exploit its existing market power in socially undesirable ways). To answer this, there may be approaches that can look at, for example, the difference in prices in markets with and without the practice (across time or across geographic markets) after controlling for differences in costs and other factors. This may be possible even when the competitive level of prices is difficult to estimate reliably.

3. Competitive Constraints on Firm Behavior

The constraints on a firm's ability to raise prices profitably depend on whether the price increase will lead consumers to switch to alternative products. If the constraints come from the potential of switching to products that are already in the marketplace, such constraints fall generally under the category of demand-side substitution, substitution that is possible solely from changes in

behavior on the demand side. If the constraints come from the potential of switching to new products sold by firms that would enter in response to a price increase, such constraints fall generally under the category of supply-side substitution—substitution on the demand-side that becomes possible as a result of changes in behavior on the supply side. In this section, we describe the basic framework for thinking about competitive constraints. In Section 4, we discuss how competitive constraints are assessed in practice.

3.1 Demand-Side Substitution[17]

Two products are substitutes when an increase in the price of one product results in consumers switching their demand to the other product. Generally the ability of any firm to increase the price of its product is less when there are more and better substitutes to which consumers can turn.

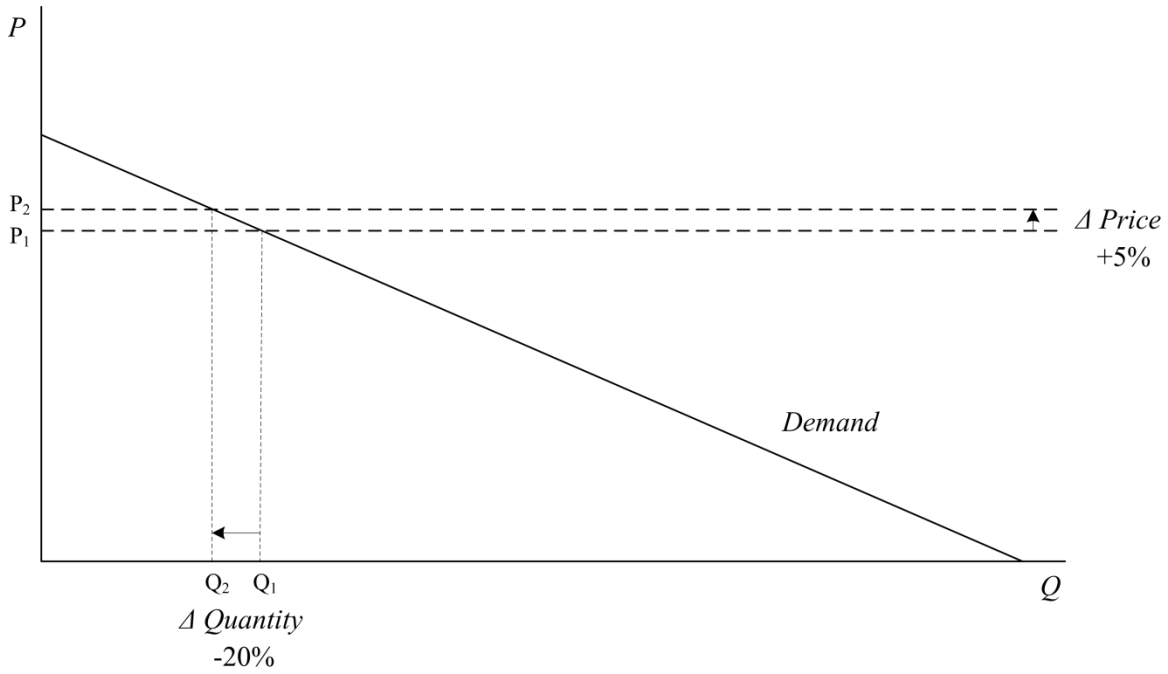
A) Price Elasticity of Demand

For a particular product, the overall degree of substitution facing a firm is reflected in the "price elasticity of demand" that the firm faces. The elasticity of demand measures the percentage reduction in quantity demanded that would result from a 1 percent increase in price. An elasticity of demand of 2, for example, means that if price increases by 1 percent the quantity sold decreases by 2 percent. As we discuss below, this elasticity can be measured by conducting statistical studies or inferred from other actions of the firm.

Figure 1 shows the demand schedule facing a specific product from a particular firm. The vertical axis shows the prices that could be charged. The horizontal axis shows the quantities that could be sold. The schedule itself shows the amount that consumers in total would purchase at each price. The line slopes downward because at lower prices consumers purchase more. At any point, the slope of the line roughly measures the elasticity of demand—the flatter the line is, the more consumers would switch as price goes up.

17 This discussion also appears in the Market Power Report, since these same considerations are relevant to the assessment of market definition and of market power.

Figure 1



B) Cross-Price Elasticity of Demand

The degree of substitution between two products is measured by the "cross-price elasticity of demand". The cross price elasticity of demand of product A with respect to the price of product B measures the percentage increase in the purchase of product A as a result of a 1% price increase in product B. (Cross-price elasticities are positive for substitutes and negative for complements.) A cross-price elasticity of 0.5 means that a 1% increase in the price of product B results in half a percent increase in the sales of product A. The price elasticity of demand for any particular product depends on cross-elasticities of demand with respect to the prices of all the other products consumers could consider. It is possible to measure these cross-elasticities from statistical studies as discussed below.

C) Marginal Consumer

The basic question that motivates the assessment of market power is whether enough consumers would switch to substitute products in response to a price increase by a supplier of the product under consideration to make the price increase unprofitable. The consumers who are most likely to switch are "marginal consumers" who were already predisposed to consider other products because they view them as good substitutes. If there are enough of these consumers who would switch then the price increase would not be profitable.

Figure 1 above illustrates this point by considering the case where every consumer buys at most one unit, a reasonable approximation for some durable-goods markets (e.g., central air conditioners or washing machines). Consumers are, in effect, listed on the demand schedule at the point corresponding to the most they would be willing to pay for the good. The diagram shows the case where a 5 percent price increase results in a 20 percent decrease in the quantity demand, as a result of there being a significant number of consumers at the margin between wanting to buy the product in question rather than substitute products. Once the price goes up, they switch.

A common mistake in the analysis of market definition and market power is to focus on what the "typical" or "average" consumer would do. The typical or average consumer may not in fact switch to substitute products when a supplier increases its price. That is the case shown in Figure 1. But it usually is not the average consumer who determines whether a supplier can profit from a price increase. So long as there are enough consumers "at the margin" between the supplier's product and alternatives the price increase cannot result in greater profits. Suppose, for example, that a firm has variable cost per unit of $5 and would sell 100 units at a price of $10 for a profit, before fixed costs, of $500. (This may or may not be enough to cover fixed costs, of course.) Suppose 80 percent of consumers would buy from this supplier even with a small price increase of say $1, so that the "typical" consumer will not switch in response to this price change. But suppose that 20 percent are extremely price sensitive, so that if this firm raised its price to $11, all would switch to another product. That would reduce sales to 80 units and reduce profit before fixed costs to $480, making the price increase unprofitable.[18]

When there is product differentiation, which is present in most real-world markets, there may be discrete categories of consumers that will switch from a product in question at various price points or based on particular product attributes. Depending on what the price is, and how much it is changing, many or a few consumers might switch in response to a price change. Understanding how the market is segmented is important in these cases. For example, premium beer lovers may be more inclined to switch to premium whisky than mass-market beer if the price of premium beer increases.

18 For details of how to analyze this in practice, see Section 4 below and Market Definition Report, Section 2.

3.2 Supply-Side Substitution

On the supply side, the analysis focuses on how other suppliers will react in response to a price increase by the firm in question. The responses fall into two main categories. First, there are rapid supply responses from firms that able to expand capacity or enter by changing their existing production and distribution facilities. Second, there are longer term supply responses from firms that would be entirely new entrants. Before it is concluded that a firm (or group of firms) has substantial market power, it is usually necessary to establish that it is protected by substantial barriers to entry.

A) Rapid Expansion and Entry

In industries where there are meaningful capacity constraints on production, the competitive constraint imposed by firms that already sell competing products depends on whether those firms can expand capacity so that by undercutting price, they can gain additional profits from additional sales. If such a firm is capacity-constrained, it may nevertheless be able to expand capacity. Such capacity expansion may come in the form of adding additional capacity to existing production facilities, such as by running extra shifts at a manufacturing plant. Capacity expansion may also come from shifting production from other related products in response to higher prices. For example, firms may shift production across different grades of paper.

In assessing whether a firm can expand capacity, it is important to assess whether expansion would take place for a given price increase. If a firm has capacity but it is committed to other products or is more profitably used for other products, then such capacity would not be a meaningful constraint. If the additional capacity is of higher cost that would make it unprofitable to be used to produce the product in question, then such capacity would also not be a meaningful competitive constraint.

Rapid entry may occur if firms that are not already selling a competing product sell a related product and can quickly shift to profitably selling the competing product. For example, paper comes in different grades that are not substitutable on the demand side—copier paper is not substitutable with letterhead paper used for formal correspondence.[19] But paper production plants can manufacture a wide range of grades of paper and can switch quickly among grades at a low cost. Thus even if a paper manufacturer is selling letterhead

19 European Commission, “Commission Notice on the Definition of Relevant Market for the Purposes of Community Competition Law” (9 December 1997), ¶ 22.

paper and not selling copier paper, it will be able to switch quickly to production of copier paper. As long as that manufacturer does not face reputation or other constraints on its ability to sell copier paper, it would function as a competitive constraint on a seller of letterhead paper.

B) Barriers to Entry

If prices are elevated, potential entrants will consider whether they can profitably enter. In the longer run, in the absence of significant barriers to entry, the firm under investigation will face competitive constraints from such entry. There is a significant debate about the definition of barrier to entry to use. The two most prominent definitions come from Joe Bain and George Stigler. Bain (1956) defined a barrier to entry as: "an advantage of established sellers in an industry over potential entrant sellers, which is reflected in the extent to which established sellers can persistently raise their prices above competitive levels without attracting new firms to enter the industry."[20] Stigler's (1968) definition of a barrier to entry is "a cost of producing (at some or every rate of output) which must be borne by firms which seek to enter an industry but is not borne by firms already in the industry."[21]

Competition authorities tend to use barriers to entry in a sense closer to Bain's definition.[22] Factors that inhibit entry by new firms, even if they have had to be addressed by incumbent firms, are viewed as barriers to entry, since they prevent entry from forcing profits back to competitive levels. We discuss the assessment of entry barriers in Section 4, below.

3.3 Other Considerations

A) Buyer Power

In some industries, important customers act as a significant constraint on market power. Such customers, which generally need to be large relative to the sales of the firm in question, can have sufficient buyer power as to limit the ability of the firm under investigation in increasing prices. These large customers have bargaining power and are able to threaten to switch their business to other

20 Joe S. Bain, Barriers to New Competition, (Cambridge, MA: Harvard University Press, 1956), p. 3.

21 George Stigler, The Organization of Industry, (Chicago, IL: University of Chicago Press, 1968). P.67.

22 See, e.g., European Commission, Article 82 Discussion Paper, ¶¶ 38-40.

existing suppliers or, perhaps, to produce the product in question themselves or help facilitate entry by independent new producers.

In assessing the impact of buyer power on market power, it is important to consider whether the competitive constraints from large customers benefit only themselves or whether they benefit most or all customers. For example, if prices are negotiated individually, a large customer may be able to limit an attempt to increase the prices that it pays, but other smaller customers may still be subject to that price increase. On the other hand, if all customers pay the same posted prices for the same products, large customers' buyer power will have a constraining effect more broadly.

B) Price Discrimination

Price discrimination—charging a higher price to some customers than others, where the price difference is not attributable to differences in the cost of serving those customers—has been taken as an indication of market power in the past. We believe that price discrimination is now rarely taken as evidence of a level of market power that raises competitive concerns.23 While it is correct that under the textbook model of perfect competition, price discrimination will not be observed, markets with price discrimination are common.24 For example, discounts for students and senior citizens are offered by restaurants, grocery stores, movie theaters, transportation companies, and a wide range of other merchants that could not plausibly have the degree of market power that is relevant to competition policy inquiries. As we noted earlier, the benchmark of textbook perfect competition should not be taken too seriously or too literally. We believe there is a consensus that it is economically sound not to rely on price discrimination as evidence of substantial market power.

C) Industry Dynamics

The extent to which an industry is subject to significant changes in competitive conditions is an important factor in assessing market power. If the shares of firms change significantly over time, that suggests that consumers are willing and able to switch among sellers in response to competition on prices and quality, and it usually indicates the presence of active competition on those

23 See discussion in Margaret A. Ward, "Symposium on Competitive Price Discrimination: Editor's Note," Antitrust Law Journal 70, no. 3 (2003): 593-597. As discussed in our report on market definition, it can be appropriate under some circumstances to define separate markets if different groups of customers face different prices. See Market Definition Report, Section 6.

24 Dennis W. Carlton and Jeffrey M. Perloff, Modern Industrial Organization, 4th ed. (Boston: Addison-Wesley, 2005), 274, 277.

dimensions. Similarly, if expansion and/or entry are commonly observed, that strongly suggests that there are no significant barriers in place.

D) Regulation

In industries that are subject to strict and pervasive regulation, the regulator may impose significant constraints on the ability of firms that would otherwise have market power to exercise it. A competition policy inquiry would need to factor in the impact of such regulatory constraints on market power. Firms subject to regulation may nevertheless have market power, but the effect of the regulatory scheme needs to be considered. Regulation may control a monopoly's pricing, for instance, but not restrict its ability to exclude new competition. More generally, there would likely need to be some coordination between the regulatory agency and the competition authority regarding their respective roles and objectives.

E) Multi-Sided Platform Businesses

A number of businesses operate platforms that create value by enabling two or more distinct groups of customers to get together, find each other, and create value by interacting. These range from shopping malls (retailers and shoppers), mobile phone platforms (application developers, hardware maker, carriers, and users), to mass media (readers/listeners/viewers and advertisers).[25] The sides of these platforms are interdependent and complementary. Changes in prices and demand on one side affect prices and demand on other sides. For example, if shopping malls increase the rent to retailers there may be fewer boutique stores, which may decrease the patronage of shoppers, which will make the mall less attractive to retailers.

The assessment of market power for firms in multi-sided platform businesses can pose particular challenges. Because there are prices for each side of a multi-sided market, firms often have some discretion in which side(s) of the market should pay more. In some markets, different firms may adopt very different business models and the same firm may change its business model over time. Thus, prices on one side of the market can differ significantly across firms and across time. Such differences are not necessarily evidence of market power, as a range of pricing schemes may be feasible in a competitive environment.

25 David S. Evans and Richard Schmalensee, "Markets with Two-Sided Platforms," Issues in Competition Law and Policy 1, (2008): 667-693.

4. Approaches for Assessing Market Power

In this section, we discuss the three main types of approaches for assessing a firm's market power discussed above and their use in assessing the level of market power and the change in market power. First, the firm's market share in the relevant market(s) and measures of concentration in the relevant market(s) are assessed relative to threshold levels. Second, there are analyses that attempt to directly measure a firm's market power, as observed in its pricing, profitability and demand elasticity. And third, there is a variety of other evidence that can help assess the competitive constraints faced by the firm.

4.1 Market Share and Market Concentration

The use of market shares in the assessment of market power has its main theoretical justification in the Cournot model of competition, in which a set of N firms selling identical products compete by setting outputs.[26] In equilibrium, when no firm can increase profits by changing its own output, given the outputs of its competitors,

$$(P - MCavg)/P = HHI/\eta \quad (1)$$

where P is the market price, η is the market demand elasticity, and, with Qi equal to firm i's output and MCi its marginal cost,

$$MC_{avg} = \sum_{i=1}^{N} S_i MC_i; \quad HHI = \sum_{i=1}^{N} (S_i)^2; \quad and\ S_i = Q_i / \sum_{i=1}^{N} Q_i, i = 1,...,N. \quad (2)$$

In this very special model the Herfindahl-Hirschman Index (HHI) of market concentration arises naturally. This model predicts that the higher is market concentration, all else equal, the higher is the markup of price over (average) marginal cost.

Moreover, this model also implies

$$(P - MCi)/P = Si/\eta,\ i = 1,\ldots,N. \quad (3)$$

That is, since there is a single price in the market, firms with lower marginal costs enjoy higher markups and higher market shares.

While this model provides some theoretical rationale for relating market shares and market concentration to market power, it is important to recognize

26 George Stigler, "A Theory of Oligopoly," Journal of Political Economy 72, no. 1 (1964): 55-59.

just how special this model. There is no product differentiation in this model, no price-setting, no innovation, and no entry or exit. It may provide a good description of some markets, but it does not provide a good description of most markets.

A) Calculation of Market Shares

While it may seem straightforward to calculate market shares once a relevant market has been defined, there are a number of factors that must be considered:

Market definition. As we discuss in extensive detail in our report on market definition, the assessment of the relevant market almost always requires judgment. There is seldom a clear boundary between products that compete with each other and products that do not. The best practice is to keep in mind that any assessment that one has made of the relevant market at the beginning of an investigation may be too broad or two narrow. There is seldom a reason to draw a hard boundary. It is better to choose a relevant market but then consider whether conclusions are sensitive to including or excluding particular competitors that were almost excluded or barely included. In particular one should not draw strong inferences from market share statistics when those market shares depend strongly on an imprecise definition of the market boundary.

Time period. Market shares are generally calculated based on historical data. Observing market shares across time is important, as changes in shares over time may reflect the characteristics of the industry. For example, if firms' shares changes significantly, and if the leading firm is periodically displaced, that may indicate significant competition even if shares for the leading firms are temporarily high. Also, if there are recent or ongoing major market developments, the impact of those developments should also be considered. Market shares are commonly calculated on an annual basis. If there are rapid developments not captured in the annual data, shorter time periods should be considered. If there are large transactions that take place less frequently than each year, longer time periods may be considered as well.

Measurement of shares. For differentiated products, market shares based on revenues are generally viewed as more relevant than market shares based on units, as revenues reflect the relative attractiveness of the products to consumers. In cases where there are firms offering low or zero prices (either because they are new entrants or because the firms have business models, such as with open source software, that dictate low or zero prices), and where the products offered by those firms are competitive constraints on higher price products, unit market shares for differentiated product may be more informative. For homogeneous products, the competitive significance of firms may depend on their capacity to meet increases in demand, in which case shares based on

capacity that is or could profitably be made available may be more relevant than shares based on existing sales. In general, when there are alternative ways of calculating shares that lead to different conclusions, a determination should be made of which method or method(s) most closely reflect the competitive significance of the firms under consideration.

B) Level of Market Power

In both the US and EU, courts and competition authorities routinely use market shares based on a definition of the relevant market (or markets) as an indicator of the level of market power. Evidence on market shares is probably the most common form of evidence regarding market power. In the US, there is the well-known statement in Alcoa that ninety percent "is enough to constitute a monopoly; it is doubtful whether sixty or sixty-four percent would be enough; and certainly thirty-three per cent is not."[27] But it is questionable whether we should rely on uniform market share thresholds for determining market power that apply generally across all cases. A firm in a market with a relatively high share that faced significant competitive constraints has less market power than a firm in a different market with a lower share that faced few significant competitive constraints. In general, there is also a focus on whether shares are persistently high across time, as temporarily high shares will likely not reflect market power that raises competition policy concerns. The competition authorities in the US have not offered explicit guidance on threshold market share for a determination of substantial market power.

In the EU, the European Court of Justice has indicated that a market share persistently above 50 percent is indicative of market power absent other evidence to the contrary.[28] The European Commission has issued similar guidance indicating that shares persistently above 50 percent are indicative of market power, although market power may still be found with shares under 40 percent. The European Commission's guidance views shares below 25 percent as indicating an absence of market power.[29]

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27 United States v. Aluminum Co. of America, 148 F.2d 416, 424 (2d Cir. 1945).

28 Case C-62/86 AKZO Chemie BV v Commission (1991).

29 See European Commission, "Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings" (May 2004), ¶17 [hereinafter, "European Commission Horizontal Merger Guidelines"]; European Commission, "DG Competition discussion paper on the application of Article 82 of the Treaty to exclusionary abuses" (December 2005), ¶31 [hereinafter, "Article 82 Discussion Paper"].

C) Changes in Market Power

Market shares, and the associated level of market concentration, can also be informative in assessing the change in market power from a business practice if there is evidence on the impact of that business practice on market shares. This is much more feasible in merger cases, as the merger can be viewed as combining the share of the two merging parties, at least as an approximation in the absence of other factors that would indicate the post-merger entity would have a significantly higher or lower share. The change in market share can also be used for assessing the change in market power from potentially anticompetitive act if the resulting change in share can be reliably estimated, but this is significantly less common than with merger review.

In the EU, the merger guidelines indicate that market shares in excess of 50 percent "may in themselves be evidence of a dominant market position" and mergers have been challenged in cases where the market share of the combined firm was between 40 and 50 percent, and even when the share was below 40 percent.[30] Market share below 25 percent are viewed under the guidelines as not raising competitive concerns. In the US, the merger guidelines do not provide explicit market share thresholds, but market shares are commonly considered in the analysis.

Merger enforcement also relies significantly on the Herfindahl-Hirschman Index (HHI), defined above. Competition authorities commonly look at HHIs and changes in HHI as guidance for whether mergers are likely to raise competitive concerns. In doing so, they look both at the post-merger level of industry concentration and the change in concentration resulting from the merger. In the EU, as a general matter, mergers are viewed as unlikely to raise concerns relating to the elimination of horizontal competition in the following scenarios: a post-merger HHI of 1,000; a post-merger HHI between 1,000 and 2,000 with a change in HHI below 250; and a post-merger HHI above 2,000 with a change in HHI below 150.[31] In the US, the analogous conditions are: a post-merger HHI of 1,500 and/or a change in HHI of less than 100.[32]

A related way of viewing the change in competition is to consider the number of significant competitors before and after the merger. A review of merger enforcement practice at the US Federal Trade Commission found that "four-to-three" mergers (where the number of significant competitors goes from four to

30 European Commission Horizontal Merger Guidelines, ¶17.

31 European Commission Horizontal Merger Guidelines, ¶19-20.

32 US Horizontal Merger Guidelines, Section 5.3.

three as a result of the merger) were the dividing line in cases involving unilateral effects. Assuming a model that only four-to-three mergers and above (that is, three-to-two and two-to-one mergers) would be challenged successfully predicted the Federal Trade Commission's actions in 87 percent of cases, slightly higher than thresholds based on shares, HHIs, or pricing pressure (which we discuss in the next section).[33]

Outside of the merger context, estimates of the change in market share and change in HHI resulting from a business practice or other challenged conducts can also be considered. The analysis is often less straightforward, for a business practice, such as a rebating scheme or a vertical contractual restriction, especially if the business practice has been in place for a long time or if other significant changes in demand or supply conditions have taken place at the same time.

D) Reliability of Market Shares as Evidence of Market Power

The market definition analysis and the resulting market shares provide useful information on the competitive constraints faced by a firm. A full consideration of the relevant market, and the competitive positions of the firms in the market, is important for understanding the competitive constraints faced by the firm under investigation. It is, however, at most a helpful input into an assessment of market power, or the change in market power. There are a number of significant factorsthat need to be considered before concluding that high market shares (or large changes in market shares) reflect market power (or changes in market power).

First, the definition of a relevant market is often imprecise. There is rarely a clear boundary delineating the products that are in and those that are out, even though the process of defining a market can give a false precision. When market shares are sensitive to the choice of what belongs in the relevant market, and when that choice is uncertain and prone to error, it does not make a lot of sense to rely on a particular market share or market concentration estimate being high or low.

Second, even if the relevant market definition is not subject to significant error, an inference of market power needs to consider whether a high market share is indeed reflective of an absence of competitive constraints on the leading firm. For example, in markets where smaller firms can expand easily and/or new

33 Malcolm B. Coate, "Counting Rivals or Measuring Share: Modeling Unilateral Effects for Merger Analysis," working paper, December 2010.

suppliers can enter easily, firms with large market shares may not have any significant market power.

Third, market shares may not correlate directly with market power because the intensity of competition depends on many factors other than market shares. For example, symmetric duopolies with each firm having a 50 percent share can range from very competitive to much less competitive. A duopoly will be highly (or almost perfectly) competitive, with prices close to marginal cost, if consumers switch readily between the two firms and the firms face no capacity constraints. On the other hand, if the firms face significant capacity constraints, or if there is significant product differentiation so that consumers have preferences for one product versus the other, the duopolists will each have significantly more market power. The fact that the shares are 50 percent does not necessarily tell us a lot about the degree of market power. An assessment of market shares needs to consider the extent to which a high share reflects significant market power.

Finally, market definition does not distinguish between close and distant substitutes within the market. When there is significant product differentiation, the competitive constraints faced by a firm are strongest from those firms selling products that are closer substitutes. A small share may understate a firm's market power if most of the products in the relevant market are relatively distant substitutes. Similarly, a larger share may overstate a firm's market power if almost all products are close substitutes. The market share metric does not distinguish between close versus distant substitutes, which can be important in the types of differentiated markets commonly at issue in competition policy inquiries.

The complexities of using market shares as measures of market power are recognized by competition authorities. For example, the US Horizontal Merger Guidelines caution against placing too much weight on market shares: "The measurement of market shares and market concentration is not an end in itself, but is useful to the extent it illuminates the merger's likely competitive effects."[34]

In practice, the authorities mainly follow the sound approach of relying primarily or exclusively on market share estimates to decide when substantial market power is unlikely, not when it is likely. That is, when market definition is relatively straightforward (as it sometimes is) and the implied relevant market shares are small, market power is unlikely to be a problem, and further analysis may not be required. If, on the other hand, market definition is problematic and one or more plausible definitions yield substantial market shares, a presumption

34 US Horizontal Merger Guidelines, Section 4.

of power is established, but further inquiry is required before a conclusion about market power can be made.

4.2 Direct Measures of Market Power

A) price-cost margin and elasticities

Given the standard definition of market power as the power to raise prices above competitive levels, or marginal cost, the perhaps natural approach to assessing market power is to attempt to estimate prices and costs directly. Prices are often observable and firms commonly track measures of costs for accounting and financial reporting. Profit maximization by a given firm implies that:

$$(P-MC)/P = -1/E \quad (4)$$

where P is price, MC is marginal cost, and E is the firm's own-price elasticity of demand. (This is not the market demand elasticity unless the firm is the only seller in the market.) The left side of (1) is the firm's price-cost margin, also known as the "Lerner Index." In a perfectly competitive market, the Lerner Index would be zero. The higher is the Lerner Index, the greater is the firm's price cost margin and the lower is its elasticity. But, while the Lerner Index does indeed measure the extent of departure from perfect competition, we noted above that perfect competition is not the appropriate standard or benchmark in a wide variety of settings.

William Landes and Richard Posner (1981) use the expression in (4) to derive a relationship between the Lerner Index and the factors affecting market power, using a model of a dominant firm with a competitive fringe of small price-taking firms:[35]

$$(P-MCd)/P = sd/[\eta + (1- sd)\varepsilon f] \quad (5)$$

where P is the market price, MCdis the dominant firm's marginal cost, sdis the dominant firm's market share, η is the market elasticity of demand, and εfis the supply elasticity of the competitive fringe. Holding all else equal, the firm's market power, as reflected in the Lerner Index, is higher when its share is higher, higher when the market demand elasticity is lower, and higher when the supply elasticity of the competitive fringe is lower. This formulation therefore provides some useful intuition. It should be emphasized, however, that the economic

35 Landes and Posner, Market Power in Antitrust.

model underlying it assumes that there is no product differentiation, like the Cournot model above, or oligopolistic interaction among firms.

The expression in (4) suggests two ways of calculating a measure of market power, using either measures of prices and marginal cost or measures of the firm's own price demand elasticity. Estimating prices is often feasible, as prices are commonly reported publicly as well as tracked by firms. There are, nevertheless, practical complications. If a product is sold in many sizes, or levels of quality, or bundled with other products, or priced differently to different consumer groups, finding the right price measure to use can be a complicated exercise. Any most firms sell multiple products. Either a composite price index would need to be constructed, or a range of different prices (and the associated marginal costs) would need to be considered.

The bigger practical challenge comes in estimating marginal costs. While cost data, as tracked in accounting and financial statements, are often plentiful, such cost data do not correspond well with either short-run or long-run marginal costs—the cost of producing the next increment of output in either the short run (with some inputs fixed) or the long run (with all inputs variable). The cost data that companies typically track relate to average or total costs in a range of different cost categories. Using average variable cost or average total cost as a measure of either short-run or long-run marginal cost is, at best, problematic.

It can be difficult even for business people at firms to estimate the marginal costs at their own firms. Costs are often lumpy—for example, selling an additional unit might not require any additional employees in the sales, marketing, distribution, human resources, or IT departments. Or, it might be the exact unit that triggers the need to hire an additional employee—after all, these departments typically expand as a firm grows in size. The right measure is probably an average across the units that trigger an increase and those that do not, but the thought experiment can still be difficult to conduct. Other difficulties in assessing marginal costs can come from the difficulty in distinguishing between changes in costs associated with permanent rather than temporary changes in output, estimating the competitive risk-adjusted costs of capital needed to operate the firm, and addressing common costs that are shared with other products. Econometric techniques for estimating marginal cost can also be used.

A related approach is to estimate firm-specific (or residual) demand elasticities, using variants of the residual demand estimation approach developed by Baker and Bresnahan.[36] The residual demand elasticity, E in equation (4), is

36 Jonathan B. Baker and Timothy F. Bresnahan, "The Gains from Merger and Collusion in Product-Differentiated Industries," The Journal of Industrial Economics 33, no. 4 (1985): 427-444; Jonathan B. Baker

(footnote continued)

the responsiveness of a firm's own demand to an increase in its own price, after taking into account the changes in demands of buyers and in supplybehavior of other firms. The statistical challenge in estimating this elasticity is to distinguish the effect of a change in only the price of the firm under investigation from changes in the prices of all firms and other factors affecting firm and market demand. One standard technique is to find cost shocks that are idiosyncratic to the firm under investigation, such as a cost increase for an input that is used only by that firm. If that firm has an increase in cost, it will have an incentive to raise prices. If the other competing firms do not have an increase in cost, their only incentive to change prices is in response to the price change of the firm in question.

If the firm experiencing the idiosyncratic cost shock is able to raise prices, then it must have some market power. If it had no market power, any attempt to increase prices would result in a complete loss of sales. The degree to which it is able to raise prices—as measured by the elasticity of its demand to prices—is therefore a measure of its market power. While this approach has a fair amount of theoretical appeal, data limitations and the lack of agreement on the threshold level that would result in a finding of market power have restricted its use in practice.

B) Economic Profits

An alternative to the Lerner Index and elasticity approaches to assessing market power is to rely on measures of profitability. As we noted, there are many models of market competition that imply positive price-cost margins but no economic profits and no entry barriers. Almost all commentators would agree that despite their price-cost margins, firms in such markets do not have the type of market power relevant to competition policy inquiries.[37] This observation leads to the measure of economic profits as a proxy for market power.

It is important first to distinguish between economic profits and accounting profits.38 Economic profits are total revenues less all costs associated with the product, including the costs of developing, producing, distributing and selling the

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and Timothy F. Bresnahan, "Estimating the Residual Demand Curve Facing a Single Firm," International Journal of Industrial Organization 6, no. 3 (1988): 283-300.

37 When average total cost (including fixed costs) exceeds marginal cost, marginal cost pricing is not sustainable in a competitive equilibrium, as firms could not operate profitably. In such cases, marginal cost pricing is likely not attainable through any intervention by competition authorities or the courts and would require regulation plus subsidies to implement.

38 Franklin M. Fisher and John J. McGowan, "On the Misuse of Accounting Rates of Return to Infer Monopoly Profits," The American Economic Review 73, no. 1 (1983): 82-97.

product. This includes the opportunity costs of all necessary capital used in the enterprise. Break-even involves zero economic profits but positive accounting profits.

In order to compute economic profits, the costs associated with research and development, the costs associated with improving product quality,and the costs of acquiring customer relationships, would be allocated or depreciated over their useful economic life. Many of these costs would be recognized for accounting purposes in the period in which they were incurred, rather than allocated over their economic life. Even though the costs of fixed assets are generally allocated over time via depreciation in computing accounting profits, common depreciation schedules may yield accounting profits that differ substantially from economic profits.

In computing economic profits, the competitive risk-adjusted rate of return for the capital needed to operate the firm would be included as an economic cost. The risk adjustment is necessary and important. If a firm is entering a new line of business, the competitive rate of return it will need has to reflect the possibility of failure. The expected profits, ex ante, reflect the probability that the firm fails, while the realized profits, ex post, for the successful firms that remain in the market must be high enough to compensate for the risk of failure.Since most restaurants fail, nobody would enter the restaurant business if the few successful restaurants did not earn substantial profits ex post. A market may have limited barriers to entry and zero ex ante economic profits but still be very risky for new entrants. A failure to adjust the profits of the successful firms for the riskiness of operating in their markets would significantly overstate their profitability and market power. On the other hand, if a firm was permanently entrenched and faced no ongoing competitive threats, it might still have market power even if had undertaken significant risk to achieve its position and it had no ex ante profits.

C) Using Direct Measures to Assess the Existence of Market Power

The price-cost margin approach is very infrequently used to assess the existence of market power. The main reasons is probably that, as we discussed in Section 2, there are significant concerns with using the model of perfect competition, with prices equal to marginal cost, as the appropriate benchmark for the competitive level. Many firms that almost all observers would agree do not have market power set price above marginal cost. We are not aware of any quantitative methodology or substantive proposals for how the benchmark level of deviation from marginal cost would be set, and how it would vary across different types of markets with, for example, different degrees of product differentiation or fixed costs. Even if we were able to estimate prices and marginal costs with perfect precision, we are not sure that there would be much

agreement about whether a 5 percent, 25 percent, or 50 percent price-cost margin would reflect market power. In addition, as we have discussed, there are a number of significant practical challenges to estimating prices and marginal costs.

Estimates of a firm's residual demand elasticity have been used in assessing the level of market power, although relatively infrequently. As is the case with price-cost margins, the benchmark of perfect competition is not appropriate for many markets, and it is difficult to establish an appropriate benchmark to use for determining when elasticities are sufficiently low so as to indicate market power. In a US case involving Kodak, the Department of Justice argued that Kodak had market power because its own-price elasticity of demand was around 2, which implied a price-cost margin of 50 percent. The court declined to find market power on this basis, noting that "[c]ertain deviations between marginal cost and price, such as those resulting from high fixed costs, are not evidence of market power" and that "there was overwhelming evidence that Kodak's film business is subject to enormous expenses that are not reflected in its short-run marginal costs."[39]

Measures of profitability are sometimes used to assess the level of market power and address some of the shortcomings of using price-cost margins and elasticities. There is probably close to a consensus that significant positive economic profits over the long run reflect the type of market power that is relevant for competition policy inquiries. But there are a host of practical challenges in estimating economic profits—rather than accounting profits—accurately, as we discussed above. In addition, there is a lack of a clear standard for how significant economic profits must be to exceed the threshold for finding market power. Some commentators argue that these challenges are so significant as to make this approach unreliable for assessing market power.[40] In any event, an assessment of a firm's profitability should be very mindful of the difficulties.

D) Use of Direct Measures to Assess Changes in Market Power

The significant challenges associated with defining the competitive price level can be avoided when the inquiry relates to the change in market power rather than the level of market power. If there are sufficient data to analyze the impact of a challenged business practice, the change in the level of prices and profits

39 United States v. Eastman Kodak, 63 F.3d 95 (2d Cir. 1995).

40 Kaplow and Shapiro, Antitrust, Section 2.41.

before and after the imposition of the practice can be used to assess the change in market power. It is important to control for the impact on market power of changes in relevant competitive factors, such as costs or the extent of competition from other firms, that are taking place at the same time.

In the merger context, it is common to use direct estimates of the change in market power, and the likely impact on prices. There are two types of approaches. First, the upward pricing pressure approach has become more prominent, and is referenced in the 2010 revision to the US Horizontal Merger Guidelines.[41] It relies only on estimates of the diversion ratio between the two merging parties and their profit margins.

Suppose Products A and B are the products sold by the respective merging parties. Prior to the merger, in considering whether to increase its price, the firm selling Product A would trade off the gain from increased revenues on those sales it retained versus the loss in profits from the sales it loses as a result of the price increase. A portion of those lost sales will go to Product B—that proportion is the "diversion ratio" DAB from Product A to Product B. As a result of the merger, the combined firm now retains the sales diverted from Product A to Product B. The profit it would make on those diverted sales is the product of the diversion ratio and the profit margin MB of Product B. The upward pricing pressure test assumes that there will be a default level of efficiencies associated with mergers, which is taken to be a marginal cost efficiency factor EA, applied to the marginal cost CA, so that there is a marginal cost reduction of EACA, which gives an incentive to reduce the price of Product A. One formulation of the net upward pricing pressure index, UPPA, is:[42]

$$UPPA = DABMB - EA(1-MA) \quad (6)$$

Evidence on substitution patterns, such as from won-lost reports, consumer surveys, or business documents may be used to estimate the diversion ratio DAB. The efficiency factor EA is typically intended as a general efficiency credit rather than a measure of efficiencies that would need to be demonstrated by the

41 US Horizontal Merger Guidelines, Section 6.1.

42 This is the version of the Farrell-Shapiro UPP equation expressed in unit-free variables. This formula does not account for the fact that the marginal cost reduction for Firm B will increase the value of sales diverted to Firm B. For further discussion, see Joseph Farrell and Carl Shapiro, "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition," The B.E. Journal of Theoretical Economics 10, No. 1 (2010); Richard Schmalensee, "Should New Merger Guidelines Give UPP Market Definition?"The Antitrust Chronicle (December 2009).

parties—10 percent has been suggested as a possible measure.[43] And the margins MA and MB, which are gross margins of prices over marginal costs, may be estimated from accounting reports and other business documents.[44] With these estimates, an assessment can be made of whether the merger is likely to result in upward pricing pressure for Product A. The same exercise is then done for Product B.

One potential concern with the upward pricing pressure approach is that it does not result in estimates of the price effects of a merger, only an indication of whether there is an incentive to increase prices. By using the upward pricing pressure framework above, and making assumptions about the shape of the demand curve, exact estimates of the price change are possible.[45] The advantage of the upward pricing pressure framework (including such potential refinements) is that it can be used with fairly limited data. No data or information on other firms is required, and it is not strictly necessary to define the relevant market. Data on the merging parties will generally be much more accessible to the competition authority as part of the merger review process. But even proponents of the framework view it as a screening mechanism to identify potentially problematic mergers.

When data permit a more fully estimated demand system, with estimates of the own price and cross price elasticities for many of the firms in the market, these parameters along with assumptions about the form of competition in the market (for example, Cournot or Bertrand), allow for merger simulation models that estimate unilateral price effects from the merger, taking the actions of all firms into account.[46] These models can also account for the effect of merger-specific efficiencies, which may be estimated or assumed.These types of merger simulation models are commonly used by competition authorities and economists for the merging parties. It should be cautioned that such models depend on a number of generally unverifiable assumptions and are thus susceptible to considerable error. The estimated price effects should accordingly be viewed cautiously. The US Horizontal Merger Guidelines recognize the use of merger simulation models but note that the authorities “do not treat merger simulation

43 Farrell and Shapiro, “Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition,” 12-13.

44 The same issues that we discussed above relating to the difficulty of estimating marginal costs would apply here, of course.

45 Schmalensee, “Should New Merger Guidelines Give UPP Market Definition?”

46 See Gregory J. Werden and Luke M. Froeb, “The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy,” Journal of Law, Economics, & Organization 10, no. 2 (1994): 407-426.

evidence as conclusive in itself, and they place more weight on whether their merger simulations consistently predict substantial price increases than on the precise prediction of any single simulation."[47]

4.3 Using Other Evidence

As we discussed in Section 3, the central question for market power is the extent to which a firm faces competitive constraints, primarily from demand side substitution and supply side substitution. These types of evidence are used both to assess whether a firm possesses market power and whether conduct increases market power.

A) Demand-Side Substitution

For demand-side substitution, it is common to review evidence that is informative on the extent to which consumers find the products sold by other firms substitutable for those sold by the firm under investigation. There is a range of potential sources of evidence to assess:[48]

Interchangeability and Functional Equivalence. Products are substitutes for each other when buyers can swap them out and obtain almost the same benefits. Although that may seem like a circular definition, in practice one can observe whether products do the almost same things, whether people use them interchangeably, and whether they obtain similar benefits when they do so. This intuitive and judgmental approach is an obvious place to start and one that courts in the US and the EU have adopted.49 An important caveat is that such an approach must take care not to identify products as substitutes when they are not substitutes at competitive prices but only become so at elevated prices that reflect market power.[50]

Company records. Companies often track their competition and therefore collect and report data on substitutes from their standpoint. There are several

47 US Horizontal Merger Guidelines, Section 6.1.

48 These topics are discussed in more detail in our report on market definition. See Market Definition Guidelines, Section 3.

49 See United States v. du Pont& Co., 351 U.S. 377 (1956); Brown Shoe Co. v. United States, 370 U.S. 294 (1962) ("The outer boundaries of a product market are determined by the reasonable interchangeability of use or the cross-elasticity of demand between the product itself and substitutes for it"). See also Case 27/76, United Brands Company and United Brands Continental BV v. European Commission, 1978 E.C.R.

50 See discussion above in footnote 13.

kinds of company documents, including: competitor analyses, won-loss reports, market research studies, and other internal documents on the competitive landscape.Although information from company files can be extremely valuable, use of such information needs to keep in mind that (1) business people may use terms such as “substitute” or “competitor” in ways that differ from their use in competition policy and (2) the information may not always be reliable if there are not sufficient incentives for business people to keep accurate records.

Customer surveys. Competition authorities can conduct surveys of the customers of the parties they are investigating as well as the customers of other firms that it conjectures (perhaps based on an interchangeability analysis) produce substitute products. In these surveys, which can be conducted via questionnaires or personal interviews, those customers can be asked about what products substitute for those that are the subject of the investigation and what firms compete with the subject or subjects of the investigation. These sorts of surveys are particular useful in business-to-business markets where there are often a small number of sophisticated buyers. In consumer markets, surveys that are designed to be the basis for statistical analysis are preferred

Natural experiments. In competition analysis the term “natural experiment” refers loosely to situations in which analysts can learn something about some key economic feature, such as the unilateral effects of a merger, from a significant change that has taken place in the marketplace or from significant differences across different locations. For example, suppose the supplier that is the subject of the investigation had to shut the production on one plant from some period of time because of a natural disaster that did not affect other suppliers in the marketplace. It might be possible to see which firms picked up sales as a result of this loss of output and determine which ones therefore provided close substitutes. This natural experiment could also provide estimates of the diversion ratios we discussed above.

B) Supply-Side Substitution

For supply-side substitution, it is common to review evidence that is informative on the extent to increases in prices would lead to supply-side substitution. There are a range of potential sources of evidence to assess:[51]

Surveys of producers and customers. The competition authority can ask suppliers about the possibility of capacity expansion, new entrant, and product

51 These topics are discussed in more detail in our report on market definition. See Market Definition Report, Section 4.

repositioning. These suppliers may be rivals of the firm under consideration and may engage in strategic behavior in responding to these inquiries. Customers may also have useful information on the ability of suppliers to divert capacity, enter or reposition themselves.

Historical studies/natural experiments. The history of the industry may provide evidence. Past diversion of capacity in the past, entry, or product repositioning suggests that these are possible in the context of the industry. Likewise the absence of these historically may cast doubt on theories of supply-side substitutability. That is particularly true if there have been natural experiments. If a producer in the relevant market considered from the demand side has increased price sharply in the past and that did not elicit supply-side responses that suggests that such responses are difficult.

C) Barriers to Entry

Unless analysis of market shares effectively rules out the possibility of substantial market power, a factual inquiry into the potential types of barriers to entry is generally conducted. The main types of barriers to entry to be considered are:

Sunk costs of entry. Entry will be more difficult if there are significant costs of entering the market that cannot be recovered upon a later exit. Costs of product development are typically sunk costs.

Economies of scale/scope. Entry will be more difficult because of the likelihood of a competitive response if a new entrant would need to operate at a significant scale or sell multiple types of products in order to gain economies of scale and scope that incumbents experience.

Intellectual property. Entry will be more difficult if a new entrant needs access to intellectual property such as patents, trade secrets, or other intangible assets held by incumbents that are important or critical to offering a competitive product.

Scarce inputs. Entry will be more difficult if a new entrant cannot obtain inputs needed for production at prices that enable the entrant to operate competitively. These can, for example, be physical inputs that have already been sold to incumbents under long term contracts or distribution facilities to which entrants would need access.

Switching costs. Entry will be more difficult if a new entrant needs to overcome the costs that customers incur to switch from incumbent firms. Switching costs may come in the form of operational or contractual costs of switching suppliers or of reputational and brand effects.

Legal barriers. Entry will be more difficult if there are significant legal restrictions on entering as a new firm, such as licenses that need to be obtained.

Capital requirements. In the past, the difficulty of acquiring capital to start a new firm or new line of business has been cited as a barrier to entry. We believe that most current observers would agree that capital markets in most jurisdictions are sufficiently efficient that this is not a major factor as a general matter, absent specific evidence that capital requirements are exceptionally difficult in a particular industry.

In assessing the existence of entry as a competitive constraint, it is important to examinethe existence or importance of these potential barriers to entry. Definitive evidence that identifiable firms would be new entrants in response to changes in price is rarely available, but one cannot rely on entry as a competitive constraint on market power without consideration of all of the potential barriers faced by new entrants. For example, it is possible to assess whether the intellectual property, types of input and production technology needed to produce the product in question are available to potential entrants. The existence of sunk costs of entry and economies of scale and scope can be directly assessed.

Evidence on past entry, or planned entry, can be extremely helpful in this assessment. For example, the existence of significant past entry strongly suggests that, absent a change in conditions, entry is relatively easy. Moreover, studying the factors behind the success, or failure, of past entry efforts can help illuminate whether potential entry barriers are significant.

4.4 Other Considerations

In some cases, evidence of the business practice at issue, such as exclusionary conduct, is itself used as part of the proof of the existence of market power.[52] As we discussed, the requirement to show market power serves an important screening function to avoid extensive inquiries in the absence of market power. Use of the allegedly anticompetitive business practice itself as evidence of market power would effectively eliminate the screening function. Given that the assessment of market power is for potentially anticompetitive business practices, which are not so inherently of competitive concern that they are condemned per se, it would be unsound to rely on the business practice that

52 Case 322/81, Nederlandsche Banden-Industrie Michelin v. Commission (1983) (Michelin I); Case T-203/01, Manufacture Française des Pneumatiques Michelin v. Commission (2004) (Michelin II).

is the subject of the inquiry as evidence that the firm engaging in the practice has market power.

With respect to whether the business practice increases the level of market power, there are also significant concerns with using the mere existence of the practice as affirmative evidence. The competition policy inquiry should focus on whether the practice increases market power, using the three main approaches discussed above. If those approaches establishes that the practice increases market power significantly and is without countervailing efficiency benefits, then the practice is properly found harmful. But relying on the existence of the practice—again, this concerns business practices that are not illegal per se—for proof of market power is circular.

5. Concluding Thoughts

The assessment of market power can be a difficult exercise. While there is agreement on the general description of market power as the ability to profitably raise prices significantly from competitive levels, there is still considerable debate regarding the approaches used to assess market power and regarding the appropriate definition of the competitive level.

The three broad types of approaches we have discussed—market shares, direct measures of market power, and other qualitative and quantitative evidence—are the main approaches used today. In more straightforward cases, it may be possible to reach a conclusion relatively easily. For example, if the relevant market is not disputed and the firm under investigation has a low share, then one can conclude that the firm does not possess significant market power in the absence of other compelling evidence. Similarly, if the result of a merger would be a firm with small shares in the relevant markets in which it operates, the merger likely poses no significant threat to competition. In more complicated cases, the available reliable evidence from each of these approaches is generally considered in assessing whether the firm faces significant competitive constraints. If different approaches lead to different answers, a careful consideration is needed of why they differ and what the respective strengths and weaknesses are of each approach. It should be recognized that all competition inquiries are subject to errors. An assessment of market power in the face of conflicting evidence will need to weigh the costs of finding market power, or an increase in market power, when there is none versus the costs of failing to find market power, or an increase in market power, when it exists.