Competition Policy and Regulation

Recent Developments in China, the US and Europe

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11. Revising the Horizontal Merger Guidelines: lessons from the US and the EU

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11.1 INTRODUCTION

The US Horizontal Merger Guidelines first promulgated in 1982 by the Antitrust Division of the Department of Justice and the Federal Trade Commission have proven to be very useful throughout the past two and half decades, and through several revisions.[1] The use of merger guidelines in the European Union has been more recent – the origins go back to the issuance of the Guidelines in 1997, with revisions that were under discussion in 2002 when the European Commission published a draft Guidelines notice (the final notice of revision was published in 2004).[2] In both the US and the EU the Guidelines have proven valuable to the parties involved in the merger process (and their experts) and to businesses that are contemplating potential mergers or acquisitions.

The modes of analysis and the applications of the Guidelines in both the US and the EU have evolved over time and there has been substantial convergence. As a result, the Guidelines provide useful models for countries that are developing merger control procedures. Recently, the US Department of Justice and Federal Trade Commission have embarked on an effort to revise and update the US Horizontal Merger Guidelines. We believe that this is an auspicious time for suitable revisions to be made in the US and a valuable opportunity for other merger control authorities to evaluate their own merger guidelines. Moreover, we see substantial benefits to be achieved if there is convergence in the merger control processes of all competition authorities worldwide.

Our chapter begins with a brief overview of the similarities and differences between the US and EU Guidelines. The fact that there is substantial overlap between the two makes a proposal for US revisions immediately applicable to the EU and elsewhere. In this chapter, we focus on market definition and its relationship to the analysis of competitive effects. Section

11.2 provides a brief overview of important elements of the US and EU guidelines relating to market definition and competitive effects.[3] In Section 11.3, we offer a number of thoughts as to how the market definition component of the US Merger Guidelines might be revised in light of the learning of economists and lawyers in the past two decades. We point out certain limitations in the analysis of market definition and, in light of these limitations, suggest that the US Guidelines and guidelines more generally should emphasize the importance of competitive effects analysis in merger evaluations. In Section 11.4, we move our focus to the analysis of competitive effects for cases in which innovation issues are significant. We suggest that guidelines can be improved if they more accurately reflect our current understanding of the forces that drive innovation.

11.2 THE US AND EC GUIDELINES

The Guidelines in the US and the EU both contain discussions of the key components of a merger analysis: market definition, competitive effects, entry, and efficiencies. Both Guidelines suggest that mergers can lead to higher prices (and/or other adverse competitive effects) in either of two different ways. First, absent efficiencies, competitive entry, or the repositioning of competitors' products, the merged firm will have an incentive to raise the prices of some or all of its products. Whether called unilateral effects as in the US, or non-coordinated effects, as in the EU, the two are generally quite similar. Thus, the EC Guidelines point out that unilateral effects can arise when a merger creates or strengthens a dominant position of a single firm, whereas the US Guidelines emphasize the possible lessening of competition. Moreover, the EC Guidelines raise concerns when the merger occurs in an oligopolistic market and the merger eliminates competitive constraints that the merging parties had previously placed on each other, whereas the US Guidelines point to the possible elimination of a disruptive competitor.

Second, given that the merger has eliminated a competitor, the merged firm may be more likely to tacitly coordinate its pricing, output, or capacity decisions with other firms in the market. Both enforcement bodies pay substantial attention to these coordinated effects.

Both the US and the EU set concentration thresholds that have the practical effect of determining safe harbours. Both Guidelines rely on the Herfindahl-Hirschman Index (HHI) as a measure of concentration. In the US, the thresholds below which mergers are unlikely to be challenged are those with post-merger HHIs below 1000, mergers with HHIs between 1000 and 1800 with deltas that are less than 100 points, and mergers with

HHIs above 1800 and deltas less than 50. In the EU the thresholds are somewhat different: they include mergers where the post-merger share is between 1000 and 2000 and the delta is less than 250, and mergers where the post-merger HHI is above 2000 and the delta is less than 150. Our experience has been that these thresholds are not accurate predictors of the likely decision-making of the enforcement authorities. As a result, we do not see the EU and US differences as significant.

Currently, however, there is one important point of divergence. The US Guidelines go a step further than the EU Guidelines by suggesting that if the merging firms' products have a combined market share of greater than 35 percent, then it will be presumed that the two products are each other's closest substitute with respect to a significant portion of sales. This particular guideline, which does not have a firm economic foundation, has been seen by some as creating an additional safe harbour. The EU has no such safe harbour in its 2004 notice. We would advise the elimination of this safe harbour when the US Guidelines are revised; it is certainly possible (although not likely) that a merger whose joint shares in a relevant market were less than 35 percent could generate anti-competitive price increases through unilateral (as well as coordinated) effects. Eliminating this safe harbour would therefore eliminate an inappropriate guideline and it would move the US and EU Guidelines closer to convergence.[4]

With respect to issues relating to entry, the two sets of guidelines are quite similar. They both emphasize that for entry to be viewed as a significant threat to the market power of the merged entity the entry must be likely, timely, and sufficient. A revision of the US and the EU guidelines that expanded their discussions of the economics of innovation could have important implications for the analysis of entry issues.

11.3 MARKET DEFINITION

The market definition exercise helps to identify the forces that might constrain the ability of a merged firm to raise prices by describing where competition occurs in product and geographic space. Once a relevant market or markets have been defined, it is then possible to evaluate questions of market power (including the measurement of market shares and the associated structural presumptions) and ultimately competitive effects. However, market definition is not a substitute for a thorough analysis of the competitive effects from a merger. In this section, we explain when and how market definition is likely to be a useful device; in general, this will be when the exercise complements the analysis of competitive effects.

However, we also point out that there are circumstances in which the effort to reach a formal evaluation as to the specific scope of the market can be distracting, if not misleading. In such cases, it will be beneficial to undertake the competitive effects analysis without necessarily reaching a formal conclusion on market definition.

11.3.1 Is the Market Definition Exercise Valuable?

The dimensions of product and geographic markets cannot always be defined with precision. Competitors are often differentiated by product characteristics or geography, and there may be no simple way to determine precisely when products are close enough substitutes to be included in the same market.

The hypothetical monopolist test in the US Merger Guidelines proposes a methodology to define a market for merger analysis. Beginning with a candidate market that includes products of the merging firms, the test asks whether a hypothetical monopolist that is the supplier of those products can profitably impose a 'small but significant and non-transitory increase in price' (a SSNIP). The hypothetical monopolist test can be useful and readily applied to determine the boundaries of market definition for products that are relatively homogeneous, such as cardboard or other packaging materials. However, the application of the SSNIP test is more difficult for products that are differentiated either by product characteristics or geographic location. Is there a relevant product market for colas, or does the market include other flavoured carbonated beverages? Do hospitals located at opposite sides of a town belong in the same relevant geographic market? Because the application of the SSNIP raises issues particularly when markets are differentiated, we comment on the use of market definition in these cases.

11.3.2 The Elements of a Demand-Side Analysis

The exercise of market power requires that the firm or firms involved face a relatively inelastic demand curve for a product at pre-merger prices. Only then can it be profitable for firms to raise prices by reducing output. It is appropriate, therefore, as the current Guidelines suggest, to focus initially on the characteristics of demand when defining relevant antitrust markets. Whether demand substitution is sufficient to prevent the exercise of market power will depend on the extent to which consumers will substitute away from the product or products at issue in the event of a hypothetical price increase.

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of the own-elasticity of demand facing the hypothetical monopolist and the monopolist's profit margin evaluated at its incremental cost (of production, distribution, and so on). However, the application of critical loss analysis has potential for error, due in part to the difficulties in calculating the critical loss and to the complexities in evaluating the consequences of the actual loss that would occur (hypothetically) post-merger.

For example, the critical loss is likely to be relatively low in markets in which firms have substantial market power (since the profit margins or mark-ups are likely to be high). However, this does not mean that the hypothetical market will fail to satisfy the SSNIP test. The reason is that firms that exert substantial market power are able to do so because they face customers whose demands are relatively inelastic (hence the high profit margins). As a result, the actual loss from a price increase is likely to be low as well. We advise against proposing critical loss or any other specific market definition methodology as a preferred approach in the Guidelines. Instead, we see value in amending the Guidelines to spell out basic economic principles and empirical evidence that will be used by the agencies, as they may apply to the concept of critical loss analysis or other approaches to market definition.

While market definition should and does focus on the own-elasticity of demand for the product or products in a given hypothetical market, there are a number of situations in which information about relevant cross-price elasticities can be highly informative. Suppose, for example, that it is determined that an initial hypothesized market is too narrow, necessitating that the market definition be expanded. The Guidelines propose one methodology for deciding how the market should be expanded, but there are a variety of alternatives that one could use to define the closest substitutes to the products in the original candidate market. While it would probably be a mistake for the revised Guidelines to adopt a particular methodology, it might be useful for a revision to describe different alternative ways of describing the diversion to competing products that occurs when and if there is a price increase in the hypothetical market.

The fundamental objective of the market definition exercise is to find a market that is worthy of analysis, that is, a market in which a merger might conceivably have an adverse affect on competition. The fact that there may be more than one market that is interesting in this sense should not be taken in itself as the basis for forgoing the market definition exercise. At the same time, the Guidelines should reiterate the premise that appropriate delineation of relevant antitrust markets is fundamentally connected to the conduct at issue.

11.3.3 The Close Relationship between Market definition and Competitive Effects Analysis

For differentiated markets the market definition methodology described in the US Merger Guidelines is very close to the central question of whether a merger will raise prices. To see why, assume for purposes of discussion that there are two products, A, and B, each owned by a separate firm. The two firms propose to merge, and, applying the smallest market principle, the products A and B become a candidate relevant market. Apart from issues involving price discrimination (which we do not discuss here), the SSNIP test evaluates the profitability of an increase in the price of A and B in this hypothetical relevant market, holding all other prices constant. If the price increase would be profitable, then A and B represent a relevant market. If the hypothesized price increase were not profitable, the market would be expanded by adding additional products, and the market definition exercise would continue.

Now compare the hypothetical monopolist test to the analysis of competitive effects. The competitive effects analysis would involve an investigation of the likely price effects associated with the merger of A and B. This analysis would include a prediction of the likely price effects, just as in the hypothetical market analysis. However, the competitive effects analysis would go further. It would involve a more extensive investigation of the competitive responses of other firms and products that are outside of the candidate market, and, of course, it would take into account issues relating to repositioning, entry, and efficiencies.

Focusing solely on the initial pricing analysis, we can see that the competitive effects analysis subsumes the hypothetical monopolist test. It is true that the hypothetical monopolist test often uses a presumed price increase of say 5 percent, whereas a competitive effects analysis would not make such an assumption, but this is a relatively minor distinction, and in principle the test can be applied to a range of pricing alternatives available to the hypothetical monopolist. The more meaningful difference relates to the fact that the competitive analysis may account for a greater range of strategic responses by other firms, whether formally in the relevant market or not.

Given that the SSNIP analysis and the competitive effects analyses are so closely related, we find it conducive to think of the market definition analysis as the hors d'oeuvre and the competitive effects analysis as the main course in the merger evaluation dinner. There are instances in which it would be sensible to undertake a competitive effects analysis directly, without necessarily reaching an initial conclusion as to market definition. It might be the case, for example, that it will be very difficult to decide

based on empirical evidence whether a relevant market should include products A, B, and C, or whether D should also be in the market. Yet, it might be the case that an empirical analysis of the potential competitive effects will show that there are likely to be (or not to be) substantial price increases whether or not product D is deemed to be in the relevant market. The Guidelines should clearly note this possibility. The Guidelines should also note that once a competitive effects analysis has been completed, it is possible to 'back out' a relevant market (or markets) that is consistent with that competitive effects analysis.[5]

11.3.4 Market Definition in Cases Involving Unilateral Conduct

The Merger Guidelines pose the question of whether a single, profit-maximizing firm controlling a candidate market would raise prices from the competitive level by a significant amount for a non-negligible time period (the SSNIP test). In merger situations, the competitive level is usually the prevailing level, except, for example, if the industry is currently coordinating prices at a monopoly level. In, for example, US Sherman Act Section 2 cases in which a firm may have monopoly power, it is necessary to consider raising prices from the 'competitive' and not the 'monopoly' level, or perhaps to evaluate the profits that would be lost if the monopoly price were lowered rather than raised. A reasonable presumption is that a single firm maximizes its profit, which implies that a SSNIP would not be profitable under any circumstances.

The Guidelines framework can be valuable in analysing unilateral behaviour to the extent that the Guidelines pose the correct questions and focus the analysis on the characteristics of market demand. However, a revision of the Merger Guidelines should note that the SSNIP test is not by itself appropriate for market definition in the context of single firm conduct without qualifying the test to allow for a competitive price level.

11.3.5 Market Definition for Complements

Many mergers involve firms that sell products that are complements, such as computer hardware and software. If A and B are complementary products sold by different firms, it is well known that a merger of the two firms can lower prices by eliminating double-marginalization and by making it easier for consumers to purchase the combination of products that they most desire. However, the implications for market definition are less well known.

A hypothetical monopolist test can lead to erroneous conclusions when applied to only a subset of complementary products. While a hypothetical

monopolist of 'right shoes' may profitably increase prices, consumers generally purchase pairs of shoes, and an increase in the price of right shoes would pressure sellers of left shoes to lower their prices. For products that are sold as bundles and are unlikely to be demanded as individual products, markets should be delineated to include the set of products that consumers buy (pairs of shoes in this case).[6]

After-markets and multi-platform markets are examples of markets with highly complementary products. Consumers purchase systems that include equipment and possibly post-sale (after-market) services. An increase in the price of after-market services puts pressure on equipment prices to compete for system sales. A hypothetical monopolist test applied to after-market services should take into account the effects of higher prices for after-market services on the sales of systems.

Platform or 'two-sided' markets refer to markets in which the consumption of products or services requires inputs from two or more activities that may be provided by separate firms. Examples are the matching of house buyers and sellers, computer operating systems and applications, and electronic payment systems that require merchant, network and consumer services. The principles of market delineation for complementary products and services apply to these multi-platform markets. In particular, an increase in the price of services for one platform may put pressure on prices for another platform. The application of a hypothetical monopolist test to platform markets should account for these potential interactions. Revised Guidelines should also make note of the complexities that arise when some firms are vertically integrated (for example, operate a platform and compete in the provision of one or more inputs to the platform).

11.3.6 Market Definition for Technology Markets

Mergers in high technology sectors of the economy often involve intellectual property (IP) such as patents and copyrights. These transactions may raise concerns that the merged entity can raise prices in a 'technology market' for IP rights. The Antitrust Guidelines for the Licensing of Intellectual Property define a technology market as '. . . the intellectual property that is licensed (the "licensed technology") and its close substitutes – that is, the technologies or goods that are close enough substitutes significantly to constrain the exercise of market power with respect to the intellectual property that is licensed.' We believe that a revision of the Horizontal Merger Guidelines could benefit practitioners and the business community by describing how the market definition methodology might be applied to technology markets.

While the approach to market definition for technology markets should

parallel the approach to market definition for product markets, there are distinguishing characteristics of technology markets that can be usefully noted. We note in particular that patents and other types of intellectual property are often complements and the analysis of mergers that invoke technology markets should apply the general issues that we discuss above for complementary products. Furthermore, intellectual property is typically an input into the production of goods and services.

As an input, the demand for IP is derived from the demand for the final goods or services that are produced using the IP. This derived demand can have a low price elasticity if the IP accounts for a small share of the cost of the final goods or services (or a high price elasticity if the converse is true). It is important to note, however, that the relevant market also includes the goods or services that are sufficiently close substitutes to constrain the exercise of market power with respect to the licensed intellectual property. The revised merger guidelines could usefully note this source of competition and describe how the agencies will account for it in their exercise of market definition.

11.4 COMPETITIVE EFFECTS OF MERGERS FOR INCENTIVES TO INNOVATE

Mergers can affect dynamic competition by changing the incentives for firms to invest in research and development (R&D) for new products and processes. A revision of the Guidelines that more fully reflected our current understanding of innovation incentives would be extremely valuable.

The theory of the effects of market structure on R&D incentives has two main themes that lead to contrasting conclusions. One theme, following Joseph Schumpeter,[7] is that market concentration promotes R&D by increasing the share of benefits from R&D that accrue to the innovator, providing funds for R&D from internal cash flow, and insulating the firm from the financial turbulence of more competitive markets.

The other main theme, following Kenneth Arrow,[8] contrasts with the Schumpeterian theory and concludes that market concentration can reduce incentives for investment in research and development. The incentive to innovate is the net difference in profit that can be earned with and without the innovation. A firm with a large pre-innovation flow of profits has less to gain from an innovation in the same market than does a more competitive firm with a lower pre-innovation profit flow, assuming that the post-innovation profit is the same for both firms. This 'replacement effect' is a drag on innovation created by a firm's pre-innovation profit flow.[9]

The structural changes from a merger have effects on incentives to innovate that are ambiguous without further analysis of conditions that are specific to each transaction. We spell out a number of these conditions below. We note in passing that the delineation of an 'innovation market' can be useful to screen transactions that are unlikely to have an adverse effect on incentives to invest in new products or processes. Adverse impacts on innovation incentives, however, depend critically on individual market circumstances. An evaluation of the effects of a merger on incentives to invest in new products and processes requires a careful consideration of competitive interactions in the market. There should be no presumption that a merger harms innovation based merely on changes in market structure from the merger.[10]

11.4.1 Unilateral Effects of Mergers on R&D Incentives

The unilateral incentive of merged firms to invest in R&D is the incremental profit created by the innovation relative to the profit that firms can earn from their existing products or processes. Mergers can promote innovation by increasing the ability of firms to appropriate the value created by their R&D efforts. This appropriation effect is particularly important for innovations that lack effective protection from imitation. However, it is also the case that under some circumstances a merger can reduce innovation incentives. A merger can be profitable to the merging firms, while lowering the incremental profit from innovation, and therefore making innovation less likely.

The effects of competition on the incentive to create new products can differ substantially from the effects of competition to lower costs. If a firm develops a drug that is a complement to an existing drug in its portfolio, the innovating firm may be able to design a marketing strategy that increases the benefits and value of both drugs. This provides an incentive to innovate that is absent for a firm that does not have a complementary therapy. In some cases, this additional benefit can outweigh the disincentive for innovation from the Arrow replacement effect.[11]

R&D is an input into the end product of innovation. A reduction in R&D spending does not, by itself, necessarily imply a reduction in innovative output. A merger can enhance dynamic competition by allowing the merged firm to better focus its R&D portfolio. For example, suppose two firms each have R&D programmes directed to a particular therapeutic area. The programmes are based on the same scientific hypothesis and their success probabilities are highly correlated. If they merge, it can be socially desirable for the firms to drop one or more programmes. Doing so would save economic resources while sacrificing little in terms of the

likelihood of introducing a safe and effective therapy. Of course, the opposite might also be the case, if, for example, there is a negative correlation between the success probabilities.

R&D and the innovations that flow from it are vital drivers of economic growth. The guidelines should make it clear that mergers that raise innovation issues will be thoroughly enforced and evaluated in part based on the economic issues that have been raised.

11.4.2 Coordinated Effects of Mergers on R&D Incentives

Coordinated effects refer to markets in which competitors recognize the mutual interdependence of their actions and refrain from conduct that is in their independent interest in order to support outcomes that increase their joint profits. Coordinated effects are more likely when: (i) firms meet often in markets with similar, predictable characteristics (a 'repeated game'); (ii) conduct that departs from coordination can be easily detected; and (iii) departures from coordination can be punished.

Coordinated effects in R&D competition are plausible but unlikely. It is difficult for firms to accurately assess the status of other firms' R&D activities. R&D success can come from unexpected sources and it is often not easy for a firm to ascertain the progress of other firms that are active in similar R&D activities. R&D often takes many years to generate a commercial product and does not have the characteristic of a repeated game, since each discovery and development programme has its own unique characteristics. Furthermore, it can be difficult for a firm to punish a defector from a collusive R&D arrangement. Typically, a defector would not be observed until it innovates, after which time there is little that other firms can do to punish the defector.

For all of these reasons one can reasonably presume, absent evidence to the contrary, that coordinated effects in R&D are unlikely in evaluating the potential effects of a merger.

11.4.3 Future Product Market Competition

An additional possible effect of a merger is on future product market competition. A merger can affect future product market competition if both companies have R&D efforts that are directed to the same product market or if one or both parties have existing products in markets that are likely to be affected by their R&D activities. Even if a merger has no effect on the R&D activities of the merging parties, the merger could affect product market competition that may emerge as a consequence of their R&D activities.

Potential competition theory can provide a normative framework to analyse such competitive effects. Factors that enter into an analysis of the effects of a merger on potential competition include: (i) the likelihood that one of the parties will be an actual entrant into a market in which the other party has a product; (ii) the likelihood that there will be other actual entrants (that is, whether the firm is a unique potential entrant); and (iii) the likelihood that there will be competition from other firms in the relevant product market(s). If more than a few firms have the same or a comparable advantage in entering the acquired firm's market, the elimination of one firm is unlikely to have a significant adverse competitive effect. Similarly, the elimination of a potential entrant is unlikely to have a significant adverse competitive effect if there are many actual market participants.

The possibility of an anti-competitive effect from the loss of potential competition is directly related to the probability that such competition may occur. For example, if the parties to a merger have independent success probabilities of 50 percent, the probability that both will succeed and compete with each other is only 25 percent. Furthermore, actual competition from entry can take a very long time and any likely anti-competitive effects would have to be balanced against likely efficiencies.

11.4.4 Necessary Conditions for a Merger to Reduce Incentives for R&D

Several conditions must be satisfied before a merger would be likely to have an adverse effect on innovation. These conditions are necessary but not sufficient for an adverse innovation effect. Furthermore, any plausible theory that innovation could be harmed should take into account the efficiency benefits from the merger.

The merger must combine R&D activities directed to potentially competing new products or processes

The structural change from a merger affects R&D incentives only if the merger integrates R&D activities that are directed to similar ends. This can occur by combining R&D activities of the merging parties that are directed to products or processes in the same relevant market, or by combining one firm's existing product with another firm's R&D directed to the same product market. Market power creates a replacement effect that can affect R&D incentives. The benefit from innovation is the increase in profit relative to no innovation, which can be low if a firm has an existing profitable position in the same market as the new innovation.

The merged companies must represent a large fraction of the R&D expenditures directed to new products that may compete in a relevant market

The Antitrust Guidelines for the Licensing of Intellectual Property provide a safe harbour for arrangements involving intellectual property in which there are five or more independent firms. The IP guidelines state that 'Absent extraordinary circumstances, the Agencies will not challenge a restraint in an intellectual property licensing arrangement if (1) the restraint is not facially anticompetitive and (2) the licensor and its licensees collectively account for no more than twenty percent of each relevant market significantly affected by the restraint.'[12]

The Antitrust Guidelines for Collaborations among Competitors goes further and states that 'Absent extraordinary circumstances, the Agencies do not challenge a competitor collaboration on the basis of effects on competition in an innovation market where three or more independently controlled research efforts in addition to those of the collaboration possess the required specialized assets or characteristics and the incentive to engage in R&D that is a close substitute for the R&D activity of the collaboration.'[13] While the IP Guidelines and the Collaboration Guidelines do not apply to competitor collaborations to which a merger analysis is applied, the implication is that anti-competitive effects from integration of R&D facilities are unlikely to be substantial unless the integration accounts for a high share of the assets directed to the discovery and development of a new product or process.

Barriers to entry into R&D directed to the new products in a relevant market must be high

Just as new entry can offset potential adverse effects of lessened competition between existing competitors resulting from a merger, so can it offset potential adverse effects from a lessening of innovation competition. In a race to patent a new discovery, absent specialized assets and exclusive intellectual property rights, firms will enter the competition if the expected return exceeds the expected cost of R&D, absent other conditions that may bar entry. If a merger causes existing competitors to invest less in R&D, then assuming no change in R&D prospects, this can trigger new entry because the entrant will have a greater probability of winning the patent race. A significant reduction in R&D effort by existing competitors is likely to make new R&D competition relatively more attractive, provided it does not signal dim innovation prospects and there are no other entry barriers.

Innovation competition can come from diverse sources, many of which are unknown to an analyst, and it is easy for an analyst to underestimate the

potential for entry into R&D directed at a new product or process. For this reason, the Antitrust Guidelines for the Licensing of Intellectual Property state that 'The Agencies will delineate an innovation market only when the capabilities to engage in the relevant research and development can be associated with specialized assets or characteristics of specific firms.'[14]

Spillovers from successful discovery and benefits from information sharing must be low

Spillovers are significant if a firm that is not the first to make a discovery can still earn a reward; that is, if discovery by one firm does not foreclose discovery of a competitive product by another firm. The absence of spillovers ensures that the winner of the innovation competition earns all of the available profit. A merger can increase incentives to invest in R&D and lower the expected time to discovery if the competition is not 'winner-take-all', which is often the case. Intuitively, the incentive to invest in R&D is reduced if a firm can earn a reward even if it is not the first to make a discovery.

11.4.5 Concluding Remarks on the Role of Innovation in Merger Analysis

The relationship between market structure and the incentive to innovate is a balance between two basic opposing forces. One force is the ability to appropriate the benefits of investment in R&D, which can be enhanced through merger. The other force is the disincentive that may exist when a firm has a significant position in a market where the innovation may occur. An established market position creates a possible replacement effect that dilutes the incentive to innovate. The replacement effect is absent or significantly diminished when neither party to a merger has a significant established position in a market or when the parties face competition from other potential innovators.

While a cautious approach to analysing the likely effects of a merger on innovation is appropriate for antitrust enforcement, both economic theory and empirical evidence are consistent with a conclusion that a merger can harm incentives for innovation under particular circumstances. A revision of the Merger Guidelines could benefit the antitrust enforcement community by describing the conditions in which a merger is more or less likely to raise concerns about harm to innovation.

NOTES

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is Robert L. Bridges Professor of Law and Professor of Economics, University of California, Berkeley. Both authors have served as Deputy Assistant Attorney General in the Antitrust Division of the Department of Justice.

1. US Department of Justice and the Federal Trade Commission (1992).
2. 'Commission Notice – Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings', DG COMP, 28, January 2004, at www.eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2004:031:0005:0018:EN:PDF. The European Commission did not get merger control authority until 1989. For a general review of the regulation, see Parisi (2009).
3. The two guidelines have different standards of proof for determining competitive harms (the EU standard focuses on the creation of a dominant position as a result of which effective competition would be significantly impeded, whereas the US uses a substantial lessening of competition test). We will not focus on this important distinction here.
4. The European Commission Notice does distinguish mergers that have unilateral effects resulting from single firm dominance from those that involve 'non-collusive oligopoly', presumably to allow for a broad set of economic theories that fall short of coordination. For a discussion of this and other EC Guidelines issues, see Ridyard (2004).
5. This relevant market may be different from the relevant market that flows from a hypothetical monopolist test because it will have taken into account the strategic responses of competitors.
6. Market definition is more complex for industries in which some firms produce and sell bundled complementary products while other firms produce only one of the bundled products. Revised guidelines should suggest how the agencies are likely to approach this market definition issue.
7. Schumpeter ([1942] 1976).
8. Arrow (1962).
9. See Tirole (1988). There are many variations on these two themes that further complicate the theory of the effects of market structure on R&D incentives. For example, market power can increase the incentive to invest in R&D because the incremental value of an innovation to a firm with market power can exceed its value to a more competitive firm. See Gilbert and Newbery (1982). This incentive is not likely to be significant for pharmaceutical R&D efforts that have a long time horizon and high degree of risk. Other models of R&D competition that incorporate elements of Schumpeterian incentives and the Arrow replacement effect include Boone (2000, 2001), and Aghion, et al. (2005).
10. For a number of examples in which the Antitrust Division successfully analysed innovation issues when mergers were involved, see Rubinfeld. and Hoven (2001).
11. For examples of applications of the Arrow replacement effect to product innovations, see Greenstein, and Ramey (1998), Gilbert (2006), and Chen and Schwartz (2009).
12. US Department of Justice and Federal Trade Commission (1995) § 4.3.
13. US Department of Justice and Federal Trade Commission (2000) § 4.3.
14. US Department of Justice and Federal Trade Commission (1995) § 3.2.3.

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