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Compulsory Licensing of Intellectual Property As Merger Remedy: A Decision-Theoretic Approach

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ABSTRACT

Consistent with its goals of encouraging innovation and enhancing consumer welfare, antitrust law generally does not compel a firm to give access to the very assets that are the source of a firm's competitive advantage, including a firm's intellectual property, unless a firm has illegitimately gained some edge in the market. And yet, in the context of merger review, compulsory licenses are a fairly common remedy. The Federal Trade Commission and Department of Justice do not impose a compulsory license in every case, but the principles guiding the decision are not entirely clear.

This Article is suspicious of the benefits of a compulsory license and concerned about the costs. Ultimately, the agencies use compulsory licenses as a remedial tool to change the post-merger market dynamics. Although a remedial compulsory license may achieve the goal of restoring competition lost as a result of the merger, it may also undermine the merged firm's incentives to innovate. This may undo the very benefits and efficiencies the merger hoped to achieve.

To take account of the uncertain effects of a compulsory license, this Article suggests the agencies adopt a decision-theoretic approach to the remedy phase of a merger analysis. The Horizontal Merger Guidelines issued in 2010 adopt an approach for reviewing mergers consistent with a decision-theoretic approach. But that process stops short of considering the potential effects of a proposed remedial mechanism. This Article recommends that the agencies extend the decision-theoretic analysis implicit in the revised Merger Guidelines and include consideration of the possible outcomes that can result if a potential remedy is chosen, the likelihood of those outcomes, as well as the magnitude of harm and benefits that will follow if those outcomes should come to pass. A decision-theoretic approach will enable the reviewing agency to take better account of the potential, but uncertain, outcomes of a potential remedy. Moreover, such an approach will discipline the agencies' decision-

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making processes, ensuring that remedies are imposed only when they are actually likely to benefit consumers.

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INTRODUCTION

In recent years, it has become generally accepted that the intellectual property laws and the antitrust laws serve the common goals of encouraging innovation and enhancing consumer welfare.[1] The intellectual property laws encourage investments in the creation, dissemination, and commercialization of original works and inventions by securing for authors and inventors, for a limited time, the exclusive right to exploit their works.[2] At the same time, the antitrust laws attempt to encourage innovation by promoting competition among firms and rewarding the winners of that competition with legitimately earned monopoly profits, as explained by the Supreme Court in *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*:

> The opportunity to charge monopoly prices—at least for a short period—is what attracts "business acumen" in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct.[3]

A firm may acquire monopoly power—*i.e.*, the ability to charge supra-competitive prices, reduce output, or otherwise harm consumer welfare—a number of ways, including by establishing facilities, personnel, and other assets that enable the firm to

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1. COUNCIL OF ECON. ADVISERS TO THE PRESIDENT OF THE U.S., ECONOMIC REPORT OF THE PRESIDENT 174 (1999) [hereinafter ECONOMIC REPORT OF THE PRESIDENT] ("The use of antitrust policy as a framework for preserving and encouraging innovation[] . . . is a more recent development . . . ."); *see also id.* at 182 ("On the surface, a tension exists between intellectual property protection and competition policy: one grants exclusive rights that confer a limited, temporary monopoly; the other seeks to keep monopoly at bay. But at a more basic level the two areas of policy have a common goal: to enhance economic performance and consumer welfare."); DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST GUIDELINES FOR THE LICENSING OF INTELLECTUAL PROPERTY 2 (1995) [hereinafter LICENSING GUIDELINES], *available at* http://www.justice.gov/atr/public/guidelines/0558.htm ("The intellectual property laws and antitrust laws share the common purpose of promoting innovation and enhancing consumer welfare."); Atari Games Corp. v. Nintendo of Am., Inc., 897 F.2d 1572, 1576 (Fed. Cir. 1990), *quoted in* LICENSING GUIDELINES at 2 n.7 ("[T]he aims and objectives of patent and antitrust law may seem, at first glance, wholly at odds. However, the two bodies of law are actually complementary, as both are aimed at encouraging innovation, industry and competition.").

2. U.S. CONST. art I., § 8; 35 U.S.C. §§ 154(a)(1), 271 (2011); 17 U.S.C. §§ 106–122, 501 (2011); *see also* LICENSING GUIDELINES, *supra* note 1, at 2.

3. 540 U.S. 398, 407 (2004).

produce goods or services that are uniquely suited to customers or by controlling intellectual property that is required to produce such goods or services. Consistent with its goal of safeguarding a firm's incentives to innovate and thereby achieve monopoly profits, antitrust law generally does not compel a firm to give access to the very assets that are the source of the firm's competitive advantage,[4] including a firm's intellectual property, unless a firm has illegitimately gained some edge in the market by engaging in conduct other than competing on the merits.[5] More specifically, antitrust law generally does not require a firm to license its intellectual property to a firm that it otherwise would not.[6] Stated another way, there is no general duty to deal on the part of intellectual property rights holders, and a firm's denial to a competitor of a license to its intellectual property is virtually privileged.[7]

And yet, in the context of mergers, compulsory licenses are a fairly common remedy.[8] This may reflect a generally held belief that, at least as a merger remedy, a compulsory license does not significantly undermine innovation incentives, and when considered together with the license's potential benefits—for example, the ability to create more competition relatively easily—such a license may actually effect a net benefit.[9] The prevalence of compulsory licenses might also reflect the agencies' prior, failed

4. *See id.* at 407–08.

5. *See, e.g.*, *id.* at 407.

6. *See, e.g.*, LICENSING GUIDELINES, *supra* note 1, at 4; *cf.* Phillip Areeda, *Essential Facilities: An Epithet in Need of Limiting Principles*, 58 ANTITRUST L.J. 841, 852 (1989) ("Compulsory access[] . . . is and should be very exceptional."). This is consistent with patent law. *See* Dawson Chemical Co. v. Rohm and Haas Co., 448 U.S. 176, 215 (1980) ("Compulsory licensing is a rarity in our patent system . . . .").

7. *But see* Ebay Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006) (holding that, where defendant has been found to infringe, intellectual property owner does not have an automatic right to permanent injunction, thereby leaving open the possibility that an infringer can extract a license from an intellectual property owner that would otherwise choose not to deal with the infringer).

8. Makan Delrahim, Deputy Assistant Attorney Gen., Anntitrust Div., U.S. Dep't of Justice, Presentation at the British Inst. of Int'l and Comparative Law, Forcing Firms to Share the Sandbox: Compulsory Licensing of Intellectual Property Rights and Antitrust 1 (May 10, 2004).

9. *See* Michael L. Katz & Howard A. Shelanski, *Mergers and Innovation*, 74 ANTITRUST L.J. 1, 62 (2007) ("[C]ompulsory licensing as a remedy that allows a merger to go through may not weaken innovation incentives and theoretically could even increase them."). *Cf.* Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575, 600 & n.70 (2007) (arguing that merger enforcement, in general, will not significantly undermine innovation incentives).

challenges and, based on that experience, their prediction that a challenge on similar grounds is likely to be unsuccessful or create bad precedent. Indeed, rather than challenge the 2011 Google-ITA merger—which, as initially presented to the DOJ, was very likely to result in anticompetitive effects with no clear, mitigating efficiencies[10]—the DOJ proposed a settlement that, among other things, required Google to continue to license ITA's software system; in its competitive impact statement outlining the proposed settlement, the DOJ explained that "[t]he United States considered[] . . . seeking preliminary and permanent injunctions against [Google's and ITA's] transaction and proceeding to a full trial on the merits," but ultimately it settled with the parties in part because it would allow the agency to "avoid[] the time, expense, and uncertainty of a full trial on the merits."[11]

Or it may reflect the fact that assessing the net value of any remedy, including a compulsory license, involves a great deal of uncertainty about the remedy's future effects on the relevant market or markets. Without a systematic way of dealing with this uncertainty, it may be very difficult to appreciate fully the remedy's benefits and costs. As a result, both the agencies and the merging firms may underestimate the remedy's effects, whether beneficial or harmful. To be sure, the agencies do not impose a compulsory license in every case.[12] But the principles guiding the decision between seeking and not seeking a compulsory license are not entirely clear.

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10. Google planned to enter the "comparative flight search market." A necessary input in that market is a software system that enables complex and customized flight search queries. Most of the firms competing in the comparative flight search market relied on ITA's software system, QPX, which essentially established QPX as the industry standard. Unremedied, the merger would have enabled Google to deprive comparative flight search market competitors, such as Kayak, TripAdvisor, and Bing Travel, of access to a necessary input—QPX—thereby foreclosing rivals from the market. *See* Competitive Impact Statement, United States v. Google Inc., NO. 1:11-CV-00688 (D.D.C. Apr. 8, 2011), *available at* http://www.justice.gov/atr/cases/f269600/269620.pdf; Complaint, United States v. Google Inc., NO. 1:11-CV-00688, ¶¶ 36–40 (D.D.C. Apr. 8, 2011), *available at* http://www.justice.gov/atr/cases/f269600/269618.pdf.

11. Competitive Impact Statement, United States v. Google Inc., *supra* note 10, at 16.

12. *See* Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., File No. 021-0026, at 6 (FTC Jan. 13, 2004), *available at* http://www.ftc.gov/os/2004/01/murisgenzymestmt.pdf; Dissenting Statement of Commissioner Mozelle W. Thompson, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., File No. 021-0026 (FTC Jan. 13, 2004), *available at* http://www.ftc.gov/os/2004/01/thompsongenzymestmt.pdf.

This Article is suspicious of the benefits of a compulsory license and concerned about the costs of such a remedy. A compulsory license ultimately seeks to prevent a merger from harming consumers by restoring the competition lost as a result of the merger. The general idea is that more competitors are better than fewer competitors, and having market participants with a relatively small share of the market is better than having the market concentrated in the hands of a few. This principle generally holds true when the underlying competitive concern is the price and output effects in the market: More competition among less powerful firms generally benefits consumers in the form of lower prices. But when the underlying concern is the innovation effects in the market, the principle is less well established.[13] Neither theoretical nor empirical studies unambiguously conclude that more competition results in more innovation and greater benefits to consumers.[14] Therefore, at least where a merger has the potential to effect innovation benefits, it is far from clear that a compulsory license will always result in a net benefit to consumers.

To take account of the uncertain effects of a compulsory license in a systematic manner, this Article suggests that the agencies' decision-making process should be guided by the principles of decision theory and expected utility theory. Specifically, this Article recommends the agencies conduct a thorough, fact-intensive analysis of a compulsory license's potentially beneficial and harmful effects in the relevant market or markets. The Horizontal Merger Guidelines issued in 2010 adopt an approach for reviewing mergers that is consistent with a decision-theoretic approach and with the suggestions of Katz & Shelanski in a paper that pre-dates the revisions to the Merger Guidelines. But the revised Merger Guidelines stop short of considering the potential effects of a proposed remedial mechanism. This Article recommends that the agencies extend the decision-theoretic analysis implicit in the revised Merger Guidelines and include consideration of the possible outcomes that can result if a potential remedy is chosen, the likelihood of those outcomes, and the magnitude of harm and benefits that will follow should those outcomes come to pass. A decision-theoretic approach will enable the reviewing agency to take better account of the potential, but uncertain, outcomes of a proposed remedy. Moreover, such an approach will discipline the agencies' decision-making process, ensuring that a remedy is imposed only when the agencies expect the remedy to benefit consumers.

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13. *See* Katz & Shelanski, *supra* note 9, at 14.
14. *Id.* at 19; ECONOMIC REPORT OF THE PRESIDENT, *supra* note 1, at 176.

This Article proceeds in four Parts. Part I briefly describes the merger review process. It explains the filing requirements of the Hart-Scott-Rodino Antitrust Improvement Act, pursuant to which most mergers are reviewed. In addition, Part I summarizes the merger review process under the recently revised Merger Guidelines, pointing out some notable differences between them and the 1992 Horizontal Merger Guidelines. One difference is the greater emphasis on innovation effects. Because compulsory licenses can cause their own innovation effects, the revised Merger Guidelines' new emphasis should enable a more thorough analysis of both the harmful and beneficial effects of compulsory licenses. Taking account of those effects is not a straightforward task, however, and Part I discusses some of the difficulties.

If a merger analysis indicates that a merger is likely to be anticompetitive, the reviewing agency must fashion an appropriate remedy. Part II considers the various remedies the reviewing agency can impose, including a compulsory license. Compulsory licenses may be a particularly attractive remedy not only because they can lower barriers to entry and lower the costs of an existing competitor, but also because they can be implemented at a very low cost to the merging firms. At the same time, however, compulsory licenses may undermine the incentives of the merged firm, the licensee, and other market participants to innovate. These costs and benefits are considered in greater detail in Part II.

Part III suggests that, in order to take full account of the potential harms and benefits of a compulsory license, the agencies should adopt a decision-theoretic approach to the remedy phase of a merger analysis. Part III briefly describes decision theory and then applies it to the remedy phase of an actual merger case, in which the FTC considered, but rejected, a compulsory license as a potential remedy.

Finally, Part IV draws some general conclusions, resulting in three model scenarios. In two scenarios—where the expected innovation effects are either harmful or nonexistent—a compulsory license as a remedial mechanism is likely unproblematic. But when a merger is likely to benefit innovation while at the same time raising concerns about price and output effects, the agencies should undertake a more thorough analysis using the tools of decision theory.

I. MERGER REVIEW

A. The Hart–Scott–Rodino Filing Requirement

The Federal Trade Commission and the Department of Justice review most mergers pursuant to the Hart–Scott–Rodino Antitrust Improvement Act of 1976 (HSR Act), although the agencies may review unconsummated mergers that do not meet the HSR Act's filing requirements at the request of the merging firms, as well as challenge mergers after they have been consummated.[15] Generally, under the HSR Act, mergers that exceed a certain value or involve firms exceeding a certain size[16] must be submitted to the DOJ's Antitrust Division and the FTC for one of the two agencies to review.[17] Staff from both agencies consult "and the matter is 'cleared' to one agency or the other for review."[18]

Once the parties have complied with the necessary filing requirements, there is a 30-day waiting period.[19] The agency to which the matter is cleared may do one of three things: (1) terminate the waiting period prior to the passing of 30 days, thereby permitting the merger to proceed early;[20] (2) allow the 30 days to expire, at which time the firms are permitted to consummate the merger;[21] or (3) make what is known as a "second request"—*i.e.*, request additional information from the merging firms.[22] If the agency makes a second request, there is an additional waiting period, after which the agency may permit the merger to proceed, challenge the merger, or take some other type of remedial action.

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15. 15 U.S.C. § 18a (2006); *see, e.g.*, Complaint, *In re* Hologic, Inc., No. C-4165, ¶ 12 (FTC July 7, 2006), *available at* http://www.ftc.gov/os/caselist/0510263/0510263complaint.pdf.

16. 15 U.S.C. § 18a(d)(1) (2006). The thresholds for filing are updated annually. *See id*. §§ 18a(2)(A), 19(a)(5).

17. Certain transactions, including some transfers of real property and some purchases of stock or other assets, are exempt from the filing requirement. *See id*. § 18a(c).

18. *See* FTC GUIDE TO THE ANTITRUST LAWS, MERGERS: PREMERGER NOTIFICATION AND THE MERGER REVIEW PROCESS, FED. TRADE COMM'N, http://www.ftc.gov/bc/antitrust/premerger_notification.shtm.

19. 15 U.S.C. §§ 18a(a) & (b)(1). In the case of a cash tender offer, the waiting period is 15 days. *Id.* § 18a(b)(1)(B).

20. *Id.* § 18a(b)(2).

21. *Id.* §§ 18a(a) & (b)(1).

22. *Id.* § 18a(e)(1)(A).

B. Horizontal Merger Guidelines

1. Merger Analysis Under the Merger Guidelines

The agencies review mergers consistent with the tools and techniques articulated in the Horizontal Merger Guidelines. In the fall of 2009, the FTC and the DOJ set out to revise the Merger Guidelines, soliciting public comment and holding a number of public workshops around the country.[23] In August 2010, the agencies issued the 2010 Horizontal Merger Guidelines (the "revised Merger Guidelines").[24] The agencies revised the review process in some notable ways that could affect the way a remedy like a compulsory license could be evaluated. [25]

Generally speaking, the revised Merger Guidelines seek to identify mergers before they are consummated that are likely to enable a firm (or firms) to raise prices, reduce output, diminish innovation, or otherwise harm consumers.[26] Merger analysis contemplates two types of competitive effects: "unilateral effects" and "coordinated effects." A merger may enhance the ability of the merged firm to exercise market power profitably without the need to cooperate with other firms in the market; these types of competitive effects are referred to as unilateral effects.[27] A merger may also make more likely "the risk of coordinated,

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23. Press Release, Fed. Trade Comm'n & Dep't of Justice, Federal Trade Commission and Department of Justice to Hold Workshops Concerning Horizontal Merger Guidelines (Sept. 22, 2009), *available at* http://www.ftc.gov/opa/2009/09/mgr.shtm; *see also Horizontal Merger Guidelines Review Project*, FED. TRADE COMM'N, http://www.ftc.gov/bc/workshops/hmg/index.shtml (last visited Feb. 11, 2010).

24. *See* DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES (2010) [hereinafter 2010 HORIZONTAL MERGER GUIDELINES], *available at* http://www.ftc.gov/os/2010/08/100819hmg.pdf.

25. The revised Guidelines encourage the courts to look to the Guidelines for assistance when considering merger challenges. *See Id.* § 1 ("[The Merger Guidelines] may also assist the courts in developing an appropriate framework for interpreting and applying the antitrust laws in the horizontal merger context."). At the time of this writing, only a handful of courts have considered an agency challenge to a merger under the revised Guidelines; all of those courts appear to have cited the revised Guidelines approvingly, but none has undertaken an in-depth analysis of the techniques articulated in the Guidelines. *See* United States v. H & R Block, Inc., __ F. Supp. 2d __ (D.D.C. 2011), No. 11-00948, 2011 WL 5438955 (D.D.C. Nov. 10, 2011); F.T.C. v. ProMedica Health Sys., Inc., No. 3:11 CV 47, slip op. at 12 (N.D. Ohio Mar. 29, 2011); F.T.C. v. Lab. Corp. of Am., No. SACV 10-1873 (AG), 2011 WL 3100372, at *14, *18–20 (C.D. Cal. Mar. 11, 2011); *see also* Behrend v. Comcast Corp., 655 F.3d 182, 211 n.10 (3d Cir. 2011) (citing revised Guidelines in a private suit).

26. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 1.

27. *Id.*

accommodating, or interdependent behavior among rivals"—the classic example is price fixing; competitive effects resulting from this type of conduct are referred to as coordinated effects.[28]

One of the most noteworthy changes to the merger review process is the emphasis on evaluating the likely competitive effects of a merger by whatever method suits the given facts and circumstances. Unlike the 1992 Merger Guidelines, which describe a single, sequential process for analyzing mergers, the revised Merger Guidelines caution, "merger analysis does not consist of uniform application of a single methodology."[29] While the 1992 Merger Guidelines rely principally on market definition, the revised Merger Guidelines describe a variety of analytical tools and techniques and types of evidence on which the enforcement agencies may rely in evaluating whether a merger is likely to result in anticompetitive effects.[30]

Perhaps most significantly, the agencies incorporated into the Merger Guidelines a more refined method for evaluating unilateral effects. The analysis begins by determining the extent to which the merging firms are direct competitors with each other, in contrast to attempting to define an entire market of products that encompasses one or both of the merging firms' products.[31] The revised Merger Guidelines recognize that "[t]he elimination of competition between two firms that results from their merger may alone constitute a substantial lessening of competition."[32] In particular, where the products of the merging firms are close substitutes, the elimination of competition between those products is more likely to result in anticompetitive effects than where the products are more distant substitutes. The merged firm can profitably raise prices on the product of one of the merging firms because some of

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28. *Id.*
29. *Id.*
30. *Id.* § 4 ("Some of the analytical tools used by the Agencies to assess competitive effects do not rely on market definition . . . .").
31. *Id.* § 6 ("The extent of direct competition between the products sold by the merging parties is central to the evaluation of unilateral price effects."). This method was first tested by the FTC in *FTC v. Whole Foods Market, Inc.*, 548 F.3d 1028, 1037–41 (D.C. Cir.), *reh'g en banc denied*, 548 F.3d 1028 (D.C. Cir. 2008), which pre-dates the revisions to the Merger Guidelines. The Merger Guidelines were revised to reflect this, and other, agency practices. *See* Carl Shapiro, Deputy Assistant Attorney Gen. for Econ., Antitrust Div., U.S. Dep't of Justice, Remarks as Prepared for the American Bar Association Section of Antitrust Law Fall Forum, Update from the Antitrust Division 13 (Nov. 18, 2010) ("From the outset, a primary motivation in revising the Guidelines was to promote transparency by describing more accurately how the Agencies actually evaluate horizontal mergers.").
32. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 6.

the sales lost as a result of the price increase will be "recaptured" by increased sales for the product of the other merging partner. The more closely the two products compete, the more lost sales the merged firm will recapture.[33]

The agencies may seek to quantify the extent to which the products of the merging firms compete, using a number of measures.[34] These measures do not necessarily require the agencies to define the relevant market first (as the 1992 Merger Guidelines do); however, defining the relevant market is eventually necessary at some point in the analysis.[35]

Another notable revision to the Guidelines is the recognition—consistent with agency practice—that the agencies may assess how customers are likely to respond by considering any available and reasonable evidence. This can include measures derived from the application of technical tools introduced in the revised Guidelines,[36] as well as evidence of competitive effects[37] and "historical events, or 'natural experiments'."[38] The agencies' use of these measures will

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33. *Id.* § 6.1. The revised Merger Guidelines further explain, "Substantial unilateral price elevation post-merger for a product formerly sold by one of the merging firms normally requires that a significant fraction of the customers purchasing that product view products formerly sold by the other merging firm as their next-best choice." *Id.*

34. Two measures introduced in the revised Guidelines are the diversion ratio and the value of diverted sales. The diversion ratio evaluates the extent to which a price increase on the product of one of the merging firms causes consumers to switch to the product of the other merging firm, as compared to the products of all other firms and as measured in terms of unit sales. In comparison, the value of diverted sales evaluates the extent to which the two firms compete by measuring the "boost" to profits that could result from a price increase, which may also indicate the "upward pricing pressure." *See id.* For a more detailed discussion regarding the application of the upward pricing pressure measure, see Shapiro, *supra* note 31, at 23–24 & nn.32–33.

35. The revised Guidelines note, "Some of the analytical tools used by the Agencies to assess competitive effects do not rely on market definition," but "evaluation of competitive alternatives available to customers"—*i.e.*, defining the relevant market—"is always necessary at some point in the analysis." 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 4. Defining the relevant market involves identifying the "set of products that are reasonably interchangeable with a product sold by one of the merging firms"—*i.e.*, the substitutes—by application of what is known as the hypothetical monopolist test. *Id.* § 4.1.1. The methodology for defining the relevant market and its application are described more thoroughly in Section 4.1 of the 2010 Horizontal Merger Guidelines.

36. *See id.* § 4.1.3.

37. *Id.* § 4.

38. This includes evidence related to the impact of recent mergers, entry, or exit in the relevant market, as well as evidence in analogous markets. *See id.* § 2.1.2; *see also* FTC v. Staples, Inc., 970 F. Supp. 1066, 1073–80 (D.D.C. 1997) (concluding from pricing data that the relevant market was "the sale of

likely result in more narrowly defined markets than markets defined under the 1992 Merger Guidelines which did not recognize such techniques.[39]

Once the relevant market is defined, the market participants and their relative shares of the market are identified[40] and the concentration of the market and the coordinated effects of the merger are evaluated using the same method outlined in the 1992 Merger Guidelines: the Hefindahl-Hirschman Index (HHI) is calculated,[41] and both the post-merger HHI and the change in the HHI are evaluated. The 2010 Merger Guidelines revised the thresholds that give rise to a presumption of competitive concern or harm.[42] The figure on the following page summarizes these presumptions.

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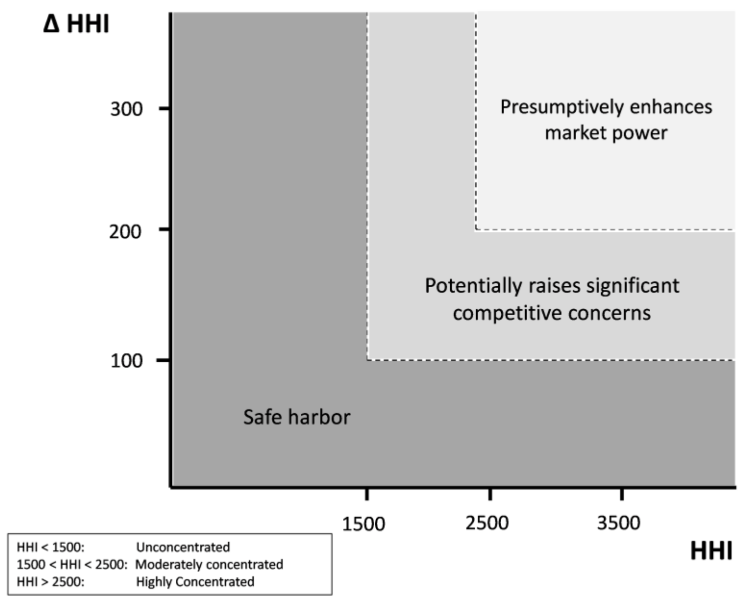
consumable office supplies through office superstores" and that Staples and Office Depot focused "primarily on competition from other superstores"); FTC v. Whole Foods Market, Inc., 548 F.3d 1028, (D.C. Cir.), *reh'g en banc denied*, 548 F.3d 1028, 1037–41 (D.C. Cir. 2008) (concluding that "premium, natural, and organic supermarkets" is a relevant market for "core customers," relying, in part, on the FTC's evidence that Wild Oats constrained the prices at Whole Foods in geographic markets where both grocery stores were located).

39. Defining markets more narrowly appears to be one of the aims of the revised Merger Guidelines: "Defining a market broadly to include relatively distant product or geographic substitutes can lead to misleading market shares." 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 4.

40. For a detailed explanation of how the agencies identify market participants and calculate market shares, see Sections 5.1 and 5.2 of the 2010 Horizontal Merger Guidelines, respectively.

41. The HHI is calculated by summing the squares of the market participants' market shares. For example, in a market with five firms having an equal share of the relevant market, the HHI is 2000 ($20^2 + 20^2 + 20^2 + 20^2 + 20^2 = 2000$).

42. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 5.3.



In comparison to the 1992 Merger Guidelines, the revised Guidelines tolerate greater changes in concentration as well as greater absolute concentration before giving rise to a presumption that the merger is anticompetitive.

As under the 1992 Merger Guidelines, if a competitive effects analysis under the revised Merger Guidelines indicates that the merger under review is likely to harm consumers, the agencies will consider a number of mitigating factors, including whether the merger induces timely, likely, and sufficient entry into the relevant market or repositioning by existing competitors and whether the merger will achieve significant efficiencies.[43] The agencies will consider only efficiencies that are "merger-specific"—*i.e.*, unable to be achieved without the merger or by another means that does not have the same anticompetitive effects.

Another feature of the Guidelines that remains unchanged is the requirement that efficiencies likely to benefit consumers in one relevant market cannot be used to offset anticompetitive harms in another market.[44] The retention of the "no-cross-market-balancing" rule is unspectacular given that the rule has its origins in the Supreme Court's decision, *United States v. Philadelphia National*

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43. *See id.* §§ 9, 10.
44. *See id.* § 10.

Bank.[45] But when considered together with the revised Merger Guidelines' greater emphasis on innovation effects—which can arise in different markets and over a different time horizon than do price and output effects—it is not clear how the agencies will conduct a competitive effects analysis.[46]

2. The Specific Case of Innovation Under the Merger Guidelines

One notable revision to the Merger Guidelines is the greater emphasis on determining a merger's effects on innovation.[47] The Merger Guidelines make clear that a competitive effects analysis of a merger includes consideration not only of price and output effects but also innovation effects.[48] Moreover, the revised Merger Guidelines consider both anti- and procompetitive innovation effects. With respect to anticompetitive innovation effects, a unilateral effects analysis considers whether the merger is likely to diminish innovation competition by encouraging the merged firm to cut back its innovation efforts.[49] For example, a merger may diminish innovation where one of the merging firms has a product under development that would directly compete with a product of the other merging firm. Likewise, a merger may diminish innovation where one of the merging firms has R&D capabilities that could have been employed to develop a product that directly

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45. 374 U.S. 321, 370–71 (1963) (rejecting consideration of efficiencies outside of the relevant market in which anticompetitive effects are anticipated).

46. The Merger Guidelines appear to recognize the hurdle posed by the no-cross-market-balancing rule, noting that "[i]n some cases[] . . . the Agencies in their prosecutorial discretion will consider efficiencies not strictly in the relevant market, but so inextricably linked with it" that a remedy could not "eliminate the anticompetitive effects in the market without sacrificing the efficiencies in the other market(s)." However, how this principle will apply in practice is unclear. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 10 n.14.

It should also be noted that new methods of analysis introduced in the revised Merger Guidelines—specifically, evaluating a merger's likely anticompetitive effects by measuring the value of diverted sales—is likely to result in more narrowly defined markets, increasing the likelihood that a merger will produce efficiencies in a market that is considered outside the market in which the anticompetitive effects are anticipated. How the revised Guidelines will deal with this issue is also unclear. *See* Joshua D. Wright, *Comment on the Proposed Update on the Horizontal Merger Guidelines: Accounting for Out-of-Market Efficiencies* (George Mason University Law & Economics, Research Paper No. 10-38, 2010), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1656538.

47. *See* Shapiro, *supra* note 31, at 29–30.

48. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, §§ 1, 6, 6.4, 10.

49. *Id.* § 6.4.

competes with a product of the other merging firm. In both cases, the merged firm's incentive to innovate is diminished because the product resulting from the innovation will essentially cannibalize the sales of another product of the merged firm.[50]

The Guidelines make clear, however, that a unilateral effects analysis of a merger considers not only harm to innovation but also benefits to innovation. For example, the combining of complementary R&D capabilities through merger may enable beneficial innovation that would otherwise not be possible.[51]

3. Price and Output Effects Versus Innovation Effects

Discerning when a merger is likely to enable innovation, rather than diminish it, is not a straightforward task. The Merger Guidelines proceed from the assumption that greater market concentration reduces competition and therefore reduces consumer welfare.[52]

When the underlying concern is whether a merger will diminish or enhance the merged firm's incentive to innovate, however, the presumption that increased market concentration is harmful to consumers does not necessarily hold.[53]

There is a longstanding debate among economists and antitrust scholars about whether increased market concentration or intense competition is the ideal market condition for promoting innovation. One view, known as the "Schumpeterian" view, is that

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50. *See id.* § 6.4 (explaining that innovation is likely to be diminished where a product under development or a future innovation initiative of one of the merging firms is likely to "capture substantial revenues" from the other merging firm ("The Agencies evaluate the extent to which successful innovation by one merging firm is likely to take sales from the other, and the extent to which post-merger incentives for future innovation will be lower than those that would prevail in the absence of the merger.")).

51. *See id.*; *see also* Katz & Shelanski, *supra* note 9, at 50–51. Katz & Shelanski explain that, in some instances, mergers—in contrast to other means for combining complementary assets, such as joint ventures or cross-licensing agreements—can reduce transaction costs. *See id.*; *see also* OLIVER E. WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS (1975), *discussed in* Katz & Shelanski, *supra* note 9, at 50–51. In those instances, the efficiencies would be "merger specific" and cognizable under the Merger Guidelines. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 10 & n.13.

52. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 2.1.3 ("Mergers that cause a significant increase in concentration and result in highly concentrated markets are presumed to be likely to enhance market power, but this presumption can be rebutted by persuasive evidence showing that the merger is unlikely to enhance market power.").

53. ECONOMIC REPORT OF THE PRESIDENT, *supra* note 1, at 174–75.

monopoly is the engine of progress.[54] This view has its roots in the writings of Joseph Schumpeter, who argued that capitalism develops through cycles of "creative destruction," whereby old technologies reign superior only temporarily, until they are displaced by new and improved technologies.[55] The true champions of this "evolutionary process," suggested Schumpeter, are large firms with market power. Indeed, Schumpeter wrote, "perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency."[56] The rationale, offered by Schumpeter and others, is that firms with market power are more capable of funding research and development and attracting outside capital investment, and supra-competitive profits better enable firms to recoup their investment and undertake long-range planning.[57]

In contrast, writing in 1962, Kenneth Arrow suggested that, at least with respect to an existing product market, a monopolist has less incentive to innovate than does a firm operating in a competitive market.[58] The monopolist has less incentive because, as the sole supplier already earning monopoly profits, the monopolist's post-innovation profits will come at the cost of its pre-innovation profits.[59] Stated another way, the monopolist's post-innovation sales and the corresponding profits will essentially cannibalize most, if not all, of its pre-innovation sales and profits. For example, consider a monopolist that develops a cost-reducing innovation. Pre-innovation, the monopolist earns $1,000 in profit, and post-innovation, it earns $1,300 in profit. The monopolist's incentive to innovate is the difference between the post-innovation profits and the pre-innovation profits—$300. In contrast, consider a firm operating in a market that is competitive but otherwise the same in all respects as the monopoly market, and the firm develops the same cost-reducing innovation. Consider further that the innovation reduces the firm's costs sufficiently such that the post-innovation profit-maximizing price is less than the pre-innovation

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54. *See* JOSEPH A. SCHUMPETER, CAPITALISM, SOCIALISM, AND DEMOCRACY 106 (3d ed. 1950).

55. *See id.* at 81–106.

56. *Id.* at 106 ("The firm of the type that is compatible with perfect competition is in many cases inferior in internal, especially technological, efficiency.").

57. *See, e.g., id.* at 81–106; ECONOMIC REPORT OF THE PRESIDENT, *supra* note 1, at 176.

58. Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention, in* THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609, 619–22 (1962).

59. *See id.* at 620 ("The preinvention monopoly power acts as a strong disincentive to further innovation.").

marginal cost. Pre-innovation, the firm prices at marginal cost and profit is $0. Post-innovation, however, the firm will be able to price at the post-innovation monopoly price. Because the post-innovation monopoly price is below the pre-innovation marginal cost, the firm will capture all of the market and earn $1,300 in profits. The competitive firm's incentive to innovate is therefore $1,300—the difference between the pre- and post-innovation profits.[60] Although the post-innovation profits are the same for the monopolist and the competitive firm, their incentives are different.

These two competing theories gave way to an extensive theoretical and empirical literature that sought to identify a relationship between innovation on the one hand, and market, firm, or industry characteristics on the other hand.[61] Some scholars have attempted to identify unifying principles throughout the literature.[62] In general, however, these studies are inconclusive and cannot support systemic presumptions about a merger's effects on innovation.[63] Specifically, enforcement agencies cannot presume a merger is likely to harm innovation merely from the fact that the merger will diminish competition between the merging firms. Katz and Shelanski suggest that one exception is a merger to monopoly, and, in that case, a presumption of harm is justified.[64] In all other cases in which the merging parties claim innovation efficiencies

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60. *See id.* If the post-innovation monopoly price is greater than the pre-innovation marginal cost, the competitive firm will be constrained by, and will not charge more than, the competitive price. However, the competitive firm's incentive remains greater than the monopolist's. *See id.* at 621.

61. For a survey of the theoretical and economic literature, see, e.g., Katz & Shelanski, *supra* note 9, at 17–30; Baker, *supra* note 9, at 577–86; Richard Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?, in* 6 INNOVATION POLICY AND THE ECONOMY 159 (Adam B. Jaffe, Josh Lerner & Scott Stern eds., 2006).

62. *See* Baker, *supra* note 9, at 579–83.

63. *See* Katz & Shelanski, *supra* note 9, at 17–30, 27 ("[T]he available data and theory show it is impossible to make definitive general statements about the linkage between market structure and innovation . . . ."); ECONOMIC REPORT OF THE PRESIDENT, *supra* note 1, at 176; Federal Trade Commission Staff Report, *Anticipating the 21st Century: Competition Policy in the New High-Tech, Global Marketplace* (1996) [hereinafter Global Marketplace Report], Vol. I, Ch. 6, at 10–11 ("On the possible existence of a causal link between concentration and innovation, all [economists] agreed that there is no clear economic theory or empiricism to support a general proposition that increased market concentration leads to reduced innovation activity."), Ch. 7, at 16.

64. Katz & Shelanski, *supra* note 9, *passim*; *see also* Global Marketplace Report, *supra* note 63, Vol. I, Ch. 7, at 19 ("Several witnesses acknowledged that the monopolist's incentives to eliminate, delay, or reduce innovation [in situations that are consistent with Arrow's theoretical model] would be quite clear.").

(or the agency predicts harm to innovation), a fact-intensive, case-by-case analysis is warranted.[65]

The other way in which consideration of innovation effects complicates a merger analysis is that a thorough investigation may reveal that the varying competitive effects of the merger do not all move in the same direction. In some instances, a merger may be likely to raise prices and reduce output, while at the same time enabling innovation that otherwise would not occur. The difficulty arises in determining how to balance short-term price and output effects against longer-term innovation effects. The Merger Guidelines recognize the possibility that "[a] merger may result in different unilateral effects along different dimensions of competition";[66] however, they are ambiguous with respect to how the agencies will trade between differing types of costs and benefits, particularly when those costs and benefits occur in different markets. Indeed, on the day the agencies released the revised Guidelines, Commissioner Rosch noted that the Guidelines failed to address this difficult issue.[67]

The difficulties in taking innovation effects into account do not merely arise at the stage of determining whether, on balance, a merger is likely to be anticompetitive or procompetitive. Such difficulties will resurface when attempting to fashion an appropriate remedy for proposed mergers that the agencies determine are likely anticompetitive. In particular, when the merger analysis indicates that the merger is likely to result in competitive effects in one dimension of competition (*e.g.*, anticompetitive price effects) that conflict with competitive effects in another dimension of competition (*e.g.*, procompetitive innovation effects) and the agency seeks to prevent one type of effect while preserving another, crafting an effective remedy may be especially difficult. Before proposing and settling on a remedy, the agencies should consider the potential remedy's effects on, not one, but all types of competitive effects. Towards that end, the agencies should extend the decision-theoretic analysis that is apparent in the revised Merger Guidelines and include consideration of the potential remedial mechanisms and their

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65. Katz & Shelanski, *supra* note 9, *passim*.
66. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 6.0.
67. Statement of Commissioner J. Thomas Rosch on the Release of the 2010 Horizontal Merger Guidelines, Project No. P092900, at 3 (Aug. 19, 2010), *available at* http://www.ftc.gov/os/2010/08/100819hmgrosch.pdf. Commissioner Rosch commented, "the Guidelines do not address some of the key issues involving innovation market analysis. For example, how should enforcers resolve cases when the predicted price effects of a merge suggest one enforcement outcome but the innovation effects suggest a different outcome?" *Id.*

respective uncertain, long–run effects. Decision theory and its application to the remedy phase of a merger analysis—and specifically its use in determining whether a compulsory license is an appropriate merger remedy—is discussed further below, in Part III.

II. MERGER REMEDIES

A. Injunction, Fix-it-First, Negotiated Settlement

The revised Merger Guidelines, like their predecessors, do not extensively address the issue of remedies.[68] Nonetheless, the enforcement agencies have broad discretion in seeking an appropriate remedy.

Broadly speaking, there are three courses of action the agencies may pursue. If there is no remedy available that would preserve competition, the agency may seek to block the merger by seeking an injunction.[69] Short of an injunction, the reviewing agency may require the merging firms to "fix-it-first"—*i.e.*, to resolve the agency's competitive concerns before the merger is consummated and before a complaint is filed.[70] Alternatively, the agency may negotiate a settlement with the parties, resulting in a consent decree, which, after an opportunity for public comment and possibly modification, is entered by a federal district court and becomes a binding court order.[71]

68. *See generally* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24; DEP'T OF JUSTICE & FED. TRADE COMM'N, HORIZONTAL MERGER GUIDELINES (1992, rev. 1997) [hereinafter 1992 HORIZONTAL MERGER GUIDELINES], *available at* http://www. ftc.gov/bc/docs/horizmer.shtm. The 2010 Merger Guidelines and the 1992 Merger Guidelines hint at potential remedial solutions. *See, e.g.*, 2010 HORIZONTAL MERGER GUIDELINES § 10 n.14 ("In some cases, . . . the Agencies in their prosecutorial discretion will consider efficiencies not strictly in the relevant market, but so inextricably linked with it that a *partial divestiture or other remedy* could not feasibly eliminate the anticompetitive effect in the relevant market without sacrificing the efficiencies in the other market(s)." (emphasis added)); *see also* 1992 HORIZONTAL MERGER GUIDELINES § 4 n.36.

69. U.S. DEP'T OF JUSTICE, ANTITRUST DIVISION POLICY GUIDE TO MERGER REMEDIES 3 (June 2011), *available at* www.justice/gov/atr/public/guidelines/ 272350.pdf.

70. *Id.* at 22.

71. *See id.* at 22–24. Ultimately, a fix-it-first remedy and a negotiated settlement attempt to achieve the same thing—to modify the original merger in order to mitigate the likely anticompetitive effects of the merger. The only difference is that a merger that is "fixed" first never results in a complaint or other filing with the court. In general, the agency will opt to file a complaint and enter a

In general, full-stop injunctions are less common than negotiated settlements or fix-it-first remedies. From 1995 through 2010, only about 10% of all FTC merger enforcement actions resulted in an injunction,[72] whereas about 25% were "fixed first," and more than 60% resulted in a negotiated settlement.[73] The prevalence of consent decrees can be explained by the HSR Act's premerger notification requirement, which affords the agencies an opportunity to review the merger, identify anticompetitive concerns, and negotiate a settlement with the merging firms prior to the merger's consummation. As the Bureau of Competition of the FTC explained in a 1999 study,

> Commission orders arising out of a merger reported pursuant to the HSR Act are almost always negotiated and entered prior to consummation of the reported merger. The requirement of premerger notification enables the antitrust agencies to insist that parties agree to remedies[] . . . before they permit the parties to consummate their transaction.[74]

The virtue of a negotiated settlement and a fix-it-first remedy is that they enable the agency to mitigate the expected anticompetitive harms while preserving the competitive benefits and efficiencies of the merger. Rather than requiring the agency to decide the binary issue of whether to approve a merger, as is, or enjoin it entirely, a settlement enables the agency to approve the merger conditioned upon the fulfillment of certain requirements by the merging firms. These requirements can be carefully tailored to target the anticompetitive effects of the merger.

B. Compulsory License

In negotiating a settlement, one of the conditions the enforcement agency can insist on is that the merged firm license some or all of its intellectual property to a third party. The FTC began experimenting with the use of a compulsory license as a

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consent decree, rather than agree to a fix-it-first remedy, when the remedy requires ongoing monitoring. *Id.* at 22–23.

72. *See* Federal Trade Commission, FTC Competition Enforcement Database, *Merger Enforcement Actions*, http://www.ftc.gov/bc/caselist/merger/index.shtml. There were 342 merger enforcement actions from 1995 through 2010, and only 34 resulted in an injunction.

73. *Id.*

74. STAFF OF THE BUREAU OF COMPETITION OF THE FED. TRADE COMM'N, A STUDY OF THE COMMISSION'S DIVESTITURE PROCESS 3 (1999) [hereinafter FTC DIVESTITURE STUDY].

remedial tool in the early 1990s.[75] Now, it is considered a "well-established tool" that is "not particularly controversial."[76]

1. Benefits of a Compulsory License

As a remedial tool, compulsory licensing to the merging firms' intellectual property is appealing for at least three reasons.

a. Lower Barriers to Entry

First, a compulsory license can be used to lower barriers to entry in the relevant market, thereby facilitating market entry by a new firm or product repositioning by an existing competitor.[77] A barrier to entry is a characteristic of a given market that makes it more difficult for competitors to enter that market.[78] Entry barriers can be tangible or intangible property, and include obstacles as variable as exclusive dealing contracts that prevent new entrants from having access to critical inputs; the efficient operation of existing competitors; and the possession by existing market participants of valuable assets such as equipment, knowledgeable and skillful personnel, and other resources that are difficult for new entrants to acquire.

Valuable intellectual property rights can pose a barrier to entry. Innovations covered by intellectual property rights can serve as upstream inputs into a downstream product, such that without a license to the underlying intellectual property, the manufacture and sale of the product could be prohibitively expensive.[79] For example, if a firm wanted to enter the market for smartphones—and compete with Apple's iPhone, Motorola's Droid, or Research In Motion's Blackberry, among others—the potential entrant would almost certainly be unable to manufacture and sell a smartphone without first obtaining a license from one or more firms holding patents covering various smartphone functionalities and capabilities or inventing around those patents. In either case, obtaining access to, and the use of, the needed innovations would likely be difficult, requiring the expenditure of a significant amount of money, time, and other resources. Entry into the market would therefore be difficult. A compulsory license to the patents

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75. *See id.* at 6.

76. Delrahim, *supra* note 8, at 1.

77. *See* FTC DIVESTITURE STUDY, *supra* note 74, at 11.

78. ROBERT H. BORK, THE ANTITRUST PARADOX: A POLICY AT WAR WITH ITSELF 310 (1978).

79. Likewise, inventions covered by valuable intellectual property rights can serve as an upstream input into a downstream market for further innovation.

covering the inventions embodied in the various smartphone functionalities would make entry into the market easier.

Alternatively, innovations covered by intellectual property rights might not, alone, make entry into the relevant market difficult or impossible, but they might contribute to entry being difficult when combined with other hurdles. For example, consider a firm that seeks to enter the market for steel production. The potential entrant will obviously need to acquire a steel mill, and overcoming that hurdle may be especially difficult. If other steel producers additionally use specialized software, not commercially available but designed in-house, to track inventory, control the manufacturing process, or otherwise reduce production costs, the potential entrant would also benefit from obtaining a license to similar software or developing such software itself because it will enable the entrant to compete more effectively. While enabling the entrant to gain access to a manufacturing plant may be the most significant way to make market entry easier, a license to the relevant software is another mechanism for lowering the barriers to entry.[80]

b. Lower an Existing Competitor's Costs

Second, a compulsory license to an existing competitor can enable the competitor to constrain the merged firm's prices. In some instances, an existing competitor can compete effectively on product features without repositioning its product, and therefore, a license to the merged firm's intellectual property for those purposes is unnecessary. The competitor's cost structure, however, may be such that it cannot compete effectively with the merged firm on price. In those cases, a compulsory license to the merged firm's intellectual property can lower the competitor's costs, which will enable the competitor to lower its prices, thereby discouraging the merged firm from raising its prices post-merger. Providing a license to an existing competitor may be an especially useful tool

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80. In instances where lack of access to real assets, such as a manufacturing plant, is the most significant barrier to entry and divestiture of those assets is an appropriate remedy, providing an entrant with a compulsory license to the merging firm's intellectual property will additionally enable those divested assets to be viable. *See* FTC DIVESTITURE STUDY, *supra* note 74, 16, 28 (noting in a 1999 study of the divestiture process that some divestiture packages "were not adequate to fully achieve the remedial purpose of the Commission's orders" and, more specifically, that divested assets were not always viable as a business because the divestiture did not include access to related assets, including "necessary technology").

for restoring premerger prices or preventing prices from increasing in the first place when new entry is unlikely or impossible.

c. Costless To Provide

Third, in most, if not all, cases, a license to intellectual property will be the most efficient way to lower barriers to entry or otherwise constrain the merged firm's prices. Intellectual property is nonrivalrous and nonexclusive—the practice of a patented invention by one firm, for example, does not prevent another firm from practicing it and from doing so simultaneously. Moreover, the merged firm's marginal cost of providing a license to a third party is close to zero. In contrast, other means of lowering barriers to entry or lowering a competitor's costs—such as the divestiture of a manufacturing plant,[81] the provision of technical assistance,[82] or the provision of incentives to employees to encourage them to seek and accept employment with the entrant[83]—can be quite costly. Thus, when compared to other mechanisms for restoring competition, a compulsory license may be the preferred mechanism.

2. Costs of a Compulsory License

Compulsory licenses, however, are not necessarily harmless to the relevant market or markets. In light of the revised Merger Guidelines' recognition that mergers may have positive innovation effects, one cost that should be of particular concern to the agencies is that a compulsory license might diminish innovation.

81. *See, e.g.*, Analysis of Agreement Containing Consent Orders to Aid Public Comment, *In re Universal Health Services, Inc. and Psychiatric Solutions, Inc.*, Docket No. C-4309, at 1 (F.T.C. Nov. 15, 2010), *available at* http://www.ftc.gov/os/caselist/1010142/101115uhspsianal.pdf (requiring divestiture of, among other things, four psychiatric facilities, eleven clinics, and all related real property).

82. *See, e.g.*, Analysis of Proposed Agreement Containing Consent Orders to Aid Public Comment, *In re Novartis AG*, Docket No. C-4296, at 3 (F.T.C. Aug. 16, 2010), *available at* http://www.ftc.gov/os/caselist/1010068/index.shtm (proposing that Novartis provide technical assistance in the manufacture of pharmaceutical product to the purchaser of divested assets).

83. *See, e.g.*, Analysis of Agreement Containing Consent Orders to Aid Public Comment, *In re AEA Investors 2006 Fund L.P., HHI Holding Corporation, and Houghton International, Inc.*, File No. 081-0245, at (F.T.C. July 14, 2010), *available at* http://www.ftc.gov/os/caselist/0810245/100709aeahoughtonanal.pdf (proposing that the merging firms "remove any contractual impediments that may deter the former . . . employees [of one of the merging firms] from accepting employment with the Commission-approved buyer").

There are at least three classes of innovation effects, which are considered further below. In sum, a compulsory license may effect a decrease in consumer welfare by deterring the merged firm from innovating; reducing the licensee's incentives to innovate; or signaling to other market participants, thereby discouraging them from investing in R&D and innovating.

a. Change the Incentives of the Merged Firm

Perhaps most significantly, requiring the merged firm to license its intellectual property to a third party will likely change the market dynamics and, therefore, it may change the incentives of the merged firm to innovate. As discussed above, a compulsory license lowers barriers to entry, thereby enabling a new firm to enter the market or an existing competitor to reposition an existing product. The end result is more competition in the post-merger market. The critical issue is whether more post-merger competition will effectively diminish the merged firm's incentive to undertake the R&D activities enabled by the merger. Stated another way: Will more competition, made possible by a remedial compulsory license, harm innovation and effectively undo the benefits of the merger? In essence, this is the heart of the Schumpeter–Arrow debate.

It is conceivable that, at least in some cases, a compulsory license could diminish the merged firm's incentives. An example illustrates the point. Consider the case where two firms that compete in a product market, Market A, seek to combine their assets, including their intellectual property portfolios and their R&D capabilities, to develop a new product that will occupy and compete in Market B. Consider further that, absent the merger, the two firms would have continued to improve their existing products in Market A. The merger may result in two types of anticompetitive effects. First, the merger will eliminate competition between the two firms in Market A and, consequently, could result in higher prices for products in Market A in the short run. Second, the merger could eliminate competition between the two firms at the innovation level, which could delay the introduction of new or improved products, as well as price reductions, in Market A (and possibly other markets).

On the other hand, the merger will enable innovation that would not otherwise be possible. When the two firms' patent portfolios are combined, the new firm will be able to undertake R&D projects and develop a product (or products) that would not be possible without use of both firms' intellectual property. This new product will compete in Market B, and depending on how drastic the innovation, it may be the only product in Market B. The Merger Guidelines recognize such innovation as a potential benefit of a merger.[84]

The enforcement agencies may seek to preserve the expected benefits while attempting to mitigate the potential harm by insisting that one or both of the merging firms license their intellectual property to a third party. If the merging firms endeavored to create an entirely new product—and did not anticipate that others would be able to do the same and enter the market—their incentive to innovate was likely the anticipation of monopoly profits in the new market, at least for a short time.

After the imposition of a compulsory license, however, the merged firm's incentive to innovate may be significantly diminished. Although the purpose of a license may be to maintain competition in Market A, a licensee may be able to use the licensed technology to innovate and develop a competing product in Market B. If Market B can support more than one competitor, the merged firm faces the possibility of sharing the market with the licensee and capturing a smaller percentage of the market—and profits—than it had anticipated. Worse yet, if Market B is a winner-take-all or winner-take-most market,[85] the merged firm faces the possibility of losing the competition with the licensee and earning no profits at all. Either way, the merged firm will have less incentive after the imposition of a compulsory license than it did before.[86]

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84. *See* 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 6.4 ("The Agencies also consider whether the merger is likely to enable innovation that would not otherwise take place, by bringing together complementary capabilities that cannot be otherwise combined or for some other merger-specific reason."); *see also* Katz & Shelanski, *supra* note 9, at 52 ("Assessments of efficiency benefits for innovation will, therefore, likely turn on the analysis of whether the merger under consideration allows the combination of complementary assets that would not otherwise be combined through a means posing less of a threat to competition.").

85. For example, a market might be winner-take-all or winner-take-most if the competition is for a military contract or the new product will exhibit network effects, such that the market can only support a few standards, at most.

86. This analysis assumes that, prior to the widespread application of the use of compulsory licenses, the merging firm had no reason to believe that a compulsory license might be imposed and therefore could not factor that risk into its analysis. After widespread application of the practice, however, this possibility should factor into the merging firms' analysis of the benefits of merging, as well as whether to undertake an R&D project. The availability of a compulsory license as a merger remedy likely improves the chances that a merger will be approved, albeit conditionally. On the other hand, the compulsory license could substantially decrease the payoffs of the merger and

Whether a compulsory license will undermine the merged firm's incentive to innovate will likely turn on the premerger market dynamics and their relationship to the merging firms' incentives. Therefore, as with a competitive effects analysis, a more thorough analysis is warranted and that analysis should take account of uncertain outcomes in multiples dimensions.

b. Change the Incentives of the Licensee

The virtue of a compulsory license is that it lowers the barriers to entry by giving the licensee access to inputs without which a licensee could not compete or could do so only after expending significant resources. After the licensee obtains access to the intellectual property and enters the market (or repositions an existing product), the licensee no longer has the incentive to develop the input itself. This, of course, is the objective of the compulsory license in the first place—to enable the entrant to avoid the investment of time, money, or other resources to develop the input so as to make entry into the market easier and to enable the entrant to be profitable at premerger prices. The entrant, engaged in competition with the merged firm, may then be incentivized to innovate further to "escape" the competition and surpass its competitor.[87] In this respect, a compulsory license goes beyond restoring competition and affirmatively spurs innovation.[88] Indeed, if the entrant intends to remain a viable competitor, it will almost definitely have to continue to innovate, releasing new or improved products and services. In the words of Microsoft CEO Steve Ballmer, "technology companies either move forward[] . . . or they die."[89]

R&D undertaking. The long-term effects of a compulsory license on the incentives of potential merging partners are considered further, below.

87. *See, e.g.*, Baker, *supra* note 9, at 579–80 (explaining that "competition among rivals producing an existing product encourages those firms to find ways to lower costs, improve quality, or develop better products," and thereby "escape competition"); Phillippe Aghion et. al., *Competition, Imitation and Growth with Step-by-Step Innovation*, 68 REV. ECON. STUD. 467, 468 n.4 (2001) (discussing "escape competition").

88. *Cf.* Howard A. Shelanski, *Unilateral Refusals to Deal in Intellectual Property and Other Property*, 76 ANTITRUST L.J. 369, 371 (2009) (noting that denial of access to intellectual property in the upstream market can have "harmful dynamic effects" in the downstream market, in the context of a refusal to deal).

89. Ashlee Vance, *Forecast for Microsoft: Partly Cloudy*, N.Y. TIMES, Oct. 18, 2009, at B1.

On the other hand, it is possible that, in the long run, the licensee's incentives may be diminished or, at the least, unchanged.[90] It is plausible that, by virtue of the compulsory license, the licensee is able to earn larger than expected profits in the short run in a market in which it had not anticipated competing. This may be enough for the licensee. Rather than invest in innovations building off of the licensed intellectual property, the licensee may be content to pocket the short run gains and phase out the product that competed with the product of the merged firm. Indeed, phasing out the product may be the most cost-effective decision for the licensee—investments to develop new or improved products are risky, at best, and the licensee, having not developed the first generation innovation itself, might very well lack important know-how and expertise, making the chances of a successful second generation innovation even less likely.[91] This may be particularly true for firms that compete in multiple product markets, so that the death of one product or division is not the death of the firm.

To be sure, the divestiture of real assets to a third party can similarly serve to undermine the productive incentives of the assets' purchaser. For example, the purchaser of a manufacturing plant has less incentive to invest in developing an efficient, suitable manufacturing facility after it purchases the merged firm's facilities. In this respect, the threat or imposition of a compulsory license does not uniquely undermine the incentives of purchasers to invest in innovative and productive endeavors. Moreover, because intellectual property rights can potentially erect an insurmountable legal barrier—when, for example, the intellectual property rights cannot be invented around—it may be that, when compared to another remedy such as the divestiture of real assets, a compulsory license is more justified.[92] But this comparison does not suggest that a compulsory license is beneficial to consumers in

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90. *Cf.* Verizon Commc'ns Inc. v. Law Offices of Curtis V. Trinko, LLP, 540 U.S. 398, 414 (2004) (explaining in the context of a refusal to deal claim that compelling a firm with monopoly power to share the source of their competitive advantage may "lessen the incentive for the monopolist, *the rival*, or both to invest in those economically beneficial facilities" (emphasis added)).

91. It is also possible that, rather than succeeding in the newly entered market, the entrant fails successfully to transform the license and other resources into a competitive, viable business, and the new business, in fact, fails. *See generally* FTC DIVESTITURE STUDY, *supra* note 74 (discussing conditions that make the failure of a divested business more likely). In that case, the entrant may be just as likely, if not more likely, to conclude that it makes economic sense to cut its losses and exit the market because of its lack of know-how and expertise.

92. *See* Shelanski, *supra* note 88, at 385–86.

every case. All this comparison suggests is that a compulsory license may, in some instances, be less costly than other reasonable means for reaching a negotiated settlement.

c. Change Incentives of Market Participants over Time

In addition to changing the incentives of the merged firm and the licensee, a compulsory license may, in the long run, have a signaling effect in the market more generally, discouraging other market participants from innovating. In theory, the use of a compulsory license as a remedial tool could affect innovation incentives in the long run in at least two ways.

First, the use of a compulsory license as a remedial tool could make merging seem less attractive and consequently discourage mergers and the innovations that are enabled only through merger. Once a compulsory license becomes an established remedial tool, a firm considering an acquisition that presents competitive issues and involves valuable intellectual property should consider the likelihood that the acquisition will be permitted only if a compulsory license is granted to a third party. Insofar as the compulsory license will diminish the expected value of the merged firm's anticipated innovations, the potential acquirer should discount the value of the acquisition accordingly. Depending on how significantly a compulsory license changes the expected value of the merged firm's anticipated innovations, the possibility of the remedy could discourage the firm from attempting to acquire the target firm. As a result, consumers may be deprived of the innovation the merged firm would have undertaken.

Second, if firms are discouraged from making acquisitions when a compulsory license is a possible remedy, firms that undertake R&D investments with an eye toward being acquired may be discouraged from making those investments in the first place. Thus, in the long run, consumers may be deprived not only of the merged firm's potential innovations but also the target firm's innovations.

To be sure, in practice, these negative innovation effects may be unlikely, at least with respect to the second type of effect. At the point of an initial R&D undertaking, the target firm (likely a start-up) faces a number of uncertainties. R&D entails a great deal of risk, and the start-up will have no way of knowing if its R&D efforts will result in a useful and valuable innovation. In addition, even if the start-up's R&D efforts prove successful, it is not a foregone conclusion that there will be a purchaser waiting in the wings. Moreover, technology-based markets are dynamic—some technologies and the products incorporating them become incredibly popular and their success results in the elimination of competing technologies and products, while others combine with new technologies, resulting in entirely new products and markets.[93] This dynamism makes it difficult to identify, ex ante, the market participants in the future relevant market (or markets), the pool of future potential buyers, and the competitive concerns that could arise during a merger review.

Therefore, at the time the potential partners are contemplating whether to merge, the possibility of a compulsory license may reduce the value of the target firm and deter the firms from merging and undertaking the R&D projects enabled by the merger. However, it may also be the case that, at the prior point in time, when the target firm is deciding whether to undertake an initial R&D project, the possibility of a compulsory license at some time down the road may be too remote and too conditional for it to make any real difference to the target firm's decision. But without a more thorough analysis, it is difficult to know which way the scale will tip.

To take full account of both the beneficial and harmful innovation effects of a potential remedial compulsory license—resulting from the changed incentives of the merged firm, the licensee, and other market participants, more generally—the agencies should conduct a thorough, fact-intensive analysis. That analysis should include consideration of uncertain, more distant outcomes. As discussed further below, decision theory is well suited for that task.

III. DECISION-THEORETIC APPROACH TO THE REMEDY PHASE OF MERGER ANALYSIS

Decision theory is an economic tool for making decisions under uncertainty. A decision-theoretic approach based on expected utility theory enables the decision maker to quantify the expected value of the various courses of action that the decision maker could take, compare those expected values, and choose the course of action that will yield the highest expected value. The expected value of a given course of action is determined by identifying all the possible outcomes that can flow from a given decision, assessing the value of each possible outcome, weighting

93. *See generally* W. BRIAN ARTHUR, THE NATURE OF TECHNOLOGY: WHAT IT IS AND HOW IT EVOLVES (2009).

each outcome by the probability the outcome will occur, and summing those values.[94]

Merger review, in general, involves a great deal of uncertainty. Consistent with Section 7 of the Clayton Act, the Merger Guidelines seek to identify anticompetitive mergers in their incipiency.[95] Merger analysis, therefore, "is necessarily predictive, requiring an assessment of what will likely happen if a merger proceeds compared to what will happen if it does not."[96] Merger efficiencies, in particular, are difficult to verify and quantify,[97] and innovation only adds to the uncertainty.[98] Merger review is therefore especially well suited for the tools of decision theory.

The revised Merger Guidelines attempt to take account of this uncertainty in at least a couple of ways. For example, unlike the 1992 Merger Guidelines, which consider as a mitigating factor only entry into the relevant market that is likely to occur within two years,[99] the revised Merger Guidelines do not specify a precise time within which entry must occur; they indicate only that "entry must be rapid enough to make unprofitable overall the actions causing" the competitive effects of concern.[100] In addition, whereas the 1992 Merger Guidelines gave less weight to efficiencies that

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94. The process can be further refined (and complicated) by taking account of the decision maker's utility function—*i.e.*, the decision maker's taste for risk and preference for certain outcomes versus other outcomes.

95. 15 U.S.C. § 18 (prohibiting acquisitions where, "in any line of commerce or in any activity affecting commerce in any section of the country, the effect of such acquisition *may be substantially to lessen competition*, or to *tend* to create a monopoly" (emphasis added)); *see also* United States v. Penn-Olin Chem. Co., 378 U.S. 158, 170–71 (1964), *aff'd*, 389 U.S. 308 (1967) (concluding that the "grand design" of Section 7 of the Clayton Act was "to arrest incipient threats to competition"); Brown Shoe Co. v. United States, 370 U.S. 294, 323 (1962) ("Congress used the words 'may be substantially to lessen competition' . . . to indicate that its concern was with probabilities, not certainties.").

96. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 1; *see also id.* ("Given this inherent need for prediction, these Guidelines reflect the congressional intent that merger enforcement should interdict competitive problems in their incipiency and that certainty about anticompetitive effect is seldom possible and not required for a merger to be illegal.").

97. *See id.* § 10.

98. Katz & Shelanski, *supra* note 9, at 56. Katz and Shelanski point out that (1) R&D is necessarily an uncertain pursuit, the benefits of which may not be apparent for a long period of time; (2) innovation incentives are imperfectly known; (3) assessing net consumer benefits can be difficult where consumers have heterogeneous valuations of the fruits of innovation; and (4) small investments can generate a large increase in consumer surplus.

99. 1992 HORIZONTAL MERGER GUIDELINES, *supra* note 68, § 3.2.

100. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 9.1.

occurred more remotely in the future,[101] the revised Merger Guidelines consider both the "likelihood" and the "magnitude" of the efficiencies asserted by the merging firms.[102] In at least these ways, the revised Merger Guidelines accord with a decision-theoretic approach.

However, as mentioned above, although the revised Merger Guidelines recognize that both anticompetitive effects and efficiencies can "operate along multiple dimensions,"[103] it is entirely unclear how these varying effects—*e.g.*, price and output on the one hand, versus innovation, on the other hand—will be balanced against each other. And even if the effects occur along the same dimension, it is not clear how, if at all, they will be balanced against each other when they arise in different markets, thereby implicating *Philadelphia National Bank*'s no-cross-market-balancing rule.

Moreover, it is not clear from the revised Merger Guidelines whether the agencies take account of the additional uncertainty a proposed remedy injects into the analysis. To the extent the agencies account for the uncertain outcomes of proposed remedial mechanisms when contemplating whether to negotiate a settlement with potential merging parties or, alternatively, to seek an injunction enjoining the merger, that should be reflected in the

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101. 1992 HORIZONTAL MERGER GUIDELINES, *supra* note 68, § 4 n.37.

102. 2010 HORIZONTAL MERGER GUIDELINES *supra* note 24, § 10. In determining whether a merger is, on balance, anticompetitive, the revised Merger Guidelines reflect the agencies' apparent policy decision to take greater precaution to avoid false negatives—*i.e.*, mistakenly allowing an anticompetitive merger to proceed unchallenged. The agencies do not simply compare the anticompetitive effects against the verifiable efficiencies. Rather, the greater the expected harm, the more the efficiencies must exceed the expected harm:

> In conducting this analysis [of efficiencies], the Agencies will not simply compare the magnitude of the cognizable efficiencies with the magnitude of the likely harm to competition absent the efficiencies. The greater the potential adverse competitive effect of a merger, the greater must be the cognizable efficiencies, and the more they must be passed through to customers, for the Agencies to conclude that the merger will not have an anticompetitive effect in the relevant market. When the potential adverse competitive effect of a merger is likely to be particularly *substantial, extraordinarily great cognizable efficiencies* would be necessary to prevent the merger from being anticompetitive.

Id. (emphasis added). This reflects the agencies' preference for false positives (mistakenly challenging a procompetitive merger) over false negatives (mistakenly not challenging an anticompetitive merger). A decision-theoretic approach does not preclude consideration of the preferences of the decision-making body; rather, it merely further refines the process. *See supra* note 94.

103. 2010 HORIZONTAL MERGER GUIDELINES, *supra* note 24, § 10; *see also id.* § 6.

Merger Guidelines. But to the extent that is not the practice of the agencies, it should be.

Specifically, the agencies should extend the decision-theoretic analysis to include consideration of the potential outcomes that can flow from a proposed remedy—a compulsory license, in particular—as well as the expected value of those outcomes. If the expected value of imposing a certain remedy does not improve the expected value of allowing the merger to proceed unchallenged, then the agencies should seek a full-stop injunction (or consider an alternative remedy).

The application of decision theory to the remedial phase of a merger analysis can be illustrated by examining the 2004 merger between Genzyme Corporation and Novazyme Pharmaceuticals, Inc. The Genzyme–Novazyme merger is an interesting and especially useful case to examine because of the merger's effects on innovation and because the FTC appears to have contemplated, but ultimately rejected, a compulsory license as a potential remedy. In addition, in an article that pre-dates the revisions to the Merger Guidelines, Katz and Shelanski recommend that the agencies use the tools of decision theory to refine the analysis of mergers, and they apply their recommendations to the Genzyme-Novazyme merger.[104] Their analysis can be extended to include consideration of a compulsory license as a potential remedial mechanism.

The Genzyme–Novazyme merger involved a merger between the only two firms engaged in researching and developing an enzyme-replacement treatment for Pompe disease, a rare and fatal disease that afflicts mostly infants and children.[105] By a divided vote, the FTC decided to close its investigation and permit the merger to proceed unchallenged,[106] thereby essentially approving a merger to monopoly.

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104. Katz & Shelanski, *supra* note 9, at 81–84.

105. Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12, at 6.

106. The Commission vote was 3-1-1. Three Commissioners, including Chairman Muris, voted in favor of closing the investigation. *See id.*; *see also* Press Release, FTC Closes its Investigation of Genzyme Corporation's 2001 Acquisition of Novazyme Pharmaceuticals, Inc. (Jan. 13, 2004), *available at* http://www.ftc.gov/opa/2004/01/genzyme.shtm.

Commissioner Mozelle W. Thompson voted in favor of issuing an administrative complaint challenging the merger and issued a dissent. Dissenting Statement of Commissioner Mozelle W. Thompson, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., *supra* note 12.

Commissioner Pamela Jones Harbour joined the Commission after the investigation had already begun and, therefore, she did not formally participate in the vote. She did, however, release her own statement in support of Commissioner Thompson's dissent. Statement of Commissioner Pamela Jones

Chairman Timothy J. Muris issued a statement in support of the majority's decision.[107] His statement is notable for a few reasons. First, his analysis is based on the merger's likely effects on innovation to the exclusion of its likely effects on price and output.[108] Second, Chairman Muris undertook a fact-intensive analysis rather than an analysis based on presumptions related to market concentration. Specifically, Chairman Muris considered the nature of R&D related to pharmaceuticals, in particular the high failure rate, the past experiences and success of the merging parties, how the merger was likely to affect the incentives of the merging firms to innovate, whether the merger would enable the firms to "conduct R&D more successfully," and the effects a compulsory license would have on the incentives of the merging firms to innovate.[109] Third, he estimated the probability of the harms and benefits from allowing the merger to proceed and approximated the net value of the merger.[110]

Specifically, Chairman Muris contemplated two possible outcomes flowing from allowing the merger to proceed: Genzyme's internal R&D efforts could either fail or succeed. He assigned the possibility of failing a 25% probability, in which case he concluded Genzyme would pursue the alternative Novazyme program and the benefit to patients would be "large." In addition, he assigned the possibility of succeeding a 75% probability, in which case Genzyme might have had an incentive to pursue the Novazyme R&D program more slowly to prevent any resulting innovations from cannibalizing the rewards of the Genzyme program; Muris estimated that was very unlikely. From this estimate, Muris concluded that the merger was likely to benefit patients.[111] Katz and Shelanski summarize Muris's analysis as follows:

(.25) * (large benefit) – (.75) * (small harm)[112]

Harbour, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., File No. 021-0026 (FTC Jan. 13, 2004), *available at* http://www.ftc.gov/os/2004/01/harbourgenzymestmt.pdf.

107. *See generally* Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12.

108. *See id.* at 5–6.

109. *Id.* at 5–21.

110. *Id.* at 19–20.

111. *Id.*

112. *See* Katz & Shelanski, *supra* note 9, at 84.

Katz and Shelanski commend Muris's approach, in general; however, they note a few problems with Muris's methodology. First, because the Genzyme–Novazyme merger was a merger to monopoly, Katz and Shelanski would have presumed the merger was harmful, and therefore the merging firms would have had to establish lack of harm. Second, Muris makes no inquiry into whether the "large" benefits to patients in the first state of the world (Genzyme's internal R&D efforts fail, Novazyme program produces large benefits) are merger-specific; to the extent they are not, they should be discounted. Third, they argue that Muris's estimation that the harm in the second state of the world (Genzyme's internal R&D efforts succeed) is likely to be small is not well justified. Muris concludes that there is a small possibility of Genzyme pursuing the Novazyme program more slowly, and from this he infers a small harm. Katz and Shelanski argue that this leaves out an important step: Muris should have additionally estimated the magnitude of the harm likely to occur if Genzyme did, indeed, delay the Novazyme program, and it is this number that should be multiplied by the low probability Muris estimated. Moreover, Katz and Shelanski note that Muris did not consider the merger's effects on the product market; these effects could be quite significant in the second-generation product market given that the merger will result in a monopoly in the first generation product market.[113]

If this revised analysis had indicated that the merger was likely to be anticompetitive, the FTC would have had to consider an appropriate remedy. To the extent the agency sought to preserve the benefits of the merger (as well as other efficiencies not otherwise reflected in the above equation[114]), while mitigating the harms, including possible harmful price and output effects in the second generation product market, a compulsory license to one of the merging parties' Pompe-related intellectual property would have been an appropriate remedy for the FTC to consider.

A thorough analysis of the remedy would have considered the possible harms and benefits of the remedy, as well as the magnitude of those harms, and incorporate them into the analysis

113. Katz & Shelanski, *supra* note 9, at 84–85. Katz and Shelanski do not note, however, how these different types of effects, arising in different markets, will be balanced against each other.

114. *See* Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12, at 17 (noting that the merger "made possible comparative experiments and provided information that enabled the Novazyme program to avoid drilling dry holes" and additionally "made possible synergies that [would] help avoid a delay in the Novazyme program").

of the merger. Before undertaking that analysis, it is important to note two challenges in evaluating a potential remedy presented by the Genzyme-Novazyme merger.

First, because Pompe disease affects a relatively small number of individuals, therapies developed to treat it are covered by the Orphan Drug Act (ODA). Under the ODA, the first firm to develop a therapy for a rare disease or condition receives seven years of market exclusivity. That exclusivity may be broken only by a competing therapy that is proven clinically superior.[115] Because of the therapy's superiority, most, if not all, of the patients using the old therapy will likely switch to the new therapy;[116] the new therapy will consequently capture most (if not all) of the market. Therefore, the market for Pompe therapies could have been described as winner-take-all.

Second, the FTC's investigation of the merger was initiated shortly after the consummation of the merger, but it was not until more than two years later that the FTC decided to drop its investigation.[117] At the time of the merger, there was no Pompe therapy on the market, but by the time the investigation was dropped, Genzyme had successfully brought a therapy to market.[118]

Because of the winner-take-all nature of the market, as well as the possibility of a displacing second generation therapy, the timing of the remedy matters. Had the FTC considered requiring the merged firm to license its intellectual property to a third party or else face a challenge to the merger soon after the merger was consummated and before a therapy had reached the market, a license could have created competition between the merged firm and the licensee to be the first to market.[119] Although a license has

115. *See, e.g.*, *id.* at 11; *see also* DEP'T OF HEALTH AND HUMAN SERVICES, OFFICE OF INSPECTOR GENERAL, THE ORPHAN DRUG ACT: IMPLEMENTATION AND IMPACT (May 2001), *available at* http://oig.hhs.gov/oei/reports/oei-09-00-00380.pdf.

116. *Cf.* Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12, at 13 n.37 (concluding that, if the merger had not taken place, it was unlikely that retaining Pompe patients would have served as an incentive for Genzyme to get its therapy to market as quicky as possible: "if a Novazyme product was sufficiently superior to break ODA exclusivity, it is not credible simply to suggest that Genzyme's first mover advantage would render doctors and patients unwilling to switch to Novazyme's product.").

117. *See id.* at 1, n.1, & 8.

118. *See id.* at 8–9.

119. *See* Dissenting Statement of Commissioner Mozelle W. Thompson, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., *supra* note 12, at 4–7. *But see* Statement of Chairman Timothy J. Muris in the Matter

the potential to undermine the innovation incentives of the merging firm in a winner-take-all market, because the merger had already been consummated, it was unlikely that the Genzyme-Novazyme merged firm would have chosen to abandon the R&D of a Pompe therapy. Moreover, a license would have enabled competition between the merged firm and the third-party licensee to develop a clinically superior second generation Pompe therapy.[120]

Even if the FTC had decided to negotiate with the merged firm after a Pompe therapy was already on the market, a compulsory license could have enabled competition between the merged firm and the licensee to develop a clinically superior second generation therapy. Thus, it seems that regardless of when a compulsory license would have been imposed, it likely would have been beneficial to consumers.

In his statement, Chairman Muris considered a compulsory license to a third party covering the Pompe-related intellectual property.[121] But, because Chairman Muris's analysis of the merger excluded consideration of the merger's effects on the product market, it was therefore incomplete. Because his analysis indicated a net benefit to patients, his consideration of the possible effects of a compulsory license was also incomplete. He focused only on the way in which the remedy would undermine the benefits the merger would otherwise produce. He considered neither the potential benefits of a compulsory license in the product market nor the potential benefits resulting from the licensee's innovation. A thorough analysis, including an analysis of the proposed remedy, would consider both the remedy's harms and benefits.

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of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12, at 22 (disagreeing with the dissent: "[T]he evidence indicates that absent the merger, Genzyme's and Novazyme's R&D would not have been influenced substantially by efforts to increase their probabilities of being first to market.").

120. *See* Dissenting Statement of Commissioner Mozelle W. Thompson, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., *supra* note 12, at 7.

121. Commissioner Muris's statement confusingly refers to a "nonexclusive license to the Novazyme *product*, such as the Dissent suggests." Statement of Chairman Timothy J. Muris in the Matter of Genzyme Corporation/Novazyme Pharmaceuticals, Inc., *supra* note 12, at 21 (emphasis added). However, in his dissent, Commissioner Thomas clearly refers to "licensing intellectual property." Dissenting Statement of Commissioner Mozelle W. Thompson, Genzyme Corporation's Acquisition of Novazyme Pharmaceuticals Inc., *supra* note 12, at 13. Therefore, it seems likely that Commissioner Muris similarly had the licensing of intellectual property in mind.

IV. MODEL SCENARIOS: A DECISION-THEORETIC APPROACH IN PRACTICE

Although a decision-theoretic approach could be used in every case in which a compulsory license is contemplated, the marginal improvements to the decision-making process may be less significant in some cases. This Part attempts to identify those scenarios in which a decision-theoretic approach would be most beneficial. In sum, it concludes that the tools of decision theory are likely to improve the decision-making process most when analysis of the merger indicates dynamic benefits to innovation.

A. Anticompetitive Effects to Static Price and Output Effects, with No Expected Benefits to Innovation

Where the merger analysis indicates that the merger is likely to result in higher prices or reduced output, and there are no expected innovation benefits of the merger, a compulsory license will very likely be beneficial to consumers.[122]

In this case, competition occurs at the product level. Because there are no expected innovation effects from the merger, the firms likely do not compete at the innovation level or are not expected to compete at the innovation level. But if they do compete at the innovation level, the competition between the firms is not very intense. Innovation is therefore likely an upstream input into a downstream product, where the competition between the firms primarily occurs.

A compulsory license to one or both of the merging firms' intellectual property will lower the barriers to entry. There may be other barriers to entry as well, and access to the merging firms' intellectual property alone may be insufficient to make entry into the relevant market likely. But a compulsory license will likely be the most efficient mechanism to lower those barriers.

For example, consider the case where two firms that compete at the product level seek to merge to realize cost savings, and one of the firms holds intellectual property rights covering internally developed software that tracks inventory. If the enforcement agency concludes that the merger is going to reduce product competition and therefore harm consumers, the agency may

122. *See* Katz & Shelanski, *supra* note 9, at 61. Katz & Shelanski recognize that a licensing remedy may be appropriate when "a proposed merger . . . raises significant concerns of harm to static price and output competition," but they make no mention of what the merger analysis reveals about the merger's anticipated innovation effects.

approve the merger only if one or both of the firms divests a manufacturing plant to a third party. In addition, the enforcement agency may insist that the merging firms grant the third party a license to the inventory-tracking software. The divestiture of the manufacturing plant is likely the most significant way to lower the third party's barriers to entry. The software license, however, can additionally enable the third party to operate the manufacturing plant more efficiently and, therefore, compete more effectively. In addition, it is relatively costless to the merging firms.

B. Anticompetitive Effects to Innovation

Similarly, when an analysis of the merger reveals that the merger is likely to harm innovation—regardless of whether the merger is likely to cause short-term price and output effects—a compulsory license to the merging firms' intellectual property is unlikely to harm consumers.

In this case, competition occurs at the innovation level. Because the merger is likely to harm innovation, the firms may be competing with each other to be the first to launch a new product that defines a new market. Alternatively, they may already compete intensely with each other and, but for the merger, one dimension of that competition may take the form of developing and releasing new and improved products. In the latter case, competition additionally occurs at the product level, and the merger likely has anticompetitive price and output effects as well.

In cases where there are anticompetitive innovation effects, a compulsory license to the merging firms' intellectual property will lower barriers to entry. In the absence of such a license, a firm that sought to enter the market would either have to invent around the merging firms' intellectual property rights or, to the extent there exists other intellectual property that can serve as a substitute for that of the merging firms, seek a license. This can be both expensive and time consuming, and as a result, may prevent the entrant from offering competitive prices or restoring competition timely enough to prevent significant harm to consumers.

The model example is a merger to monopoly in the product market. The merger would not only reduce competition at the product level, but it would also diminish the merged firm's incentive to innovate because future innovations would cannibalize the monopolist's present sales. Although the incentive to develop a first generation innovation can be quite significant because of first-mover advantages, particularly if the innovator does not immediately anticipate competitors, when it comes to second generation innovations—*i.e.*, innovations adding onto, improving, or otherwise building off of the prior technology—competition is more important.[123]

The 2009 merger between Ticketmaster Entertainment and Live Nation is illustrative. For more than two decades, Ticketmaster dominated the market for "primary ticketing services"—*i.e.*, the market for services that facilitate the initial sale of tickets to concertgoers. Ticketmaster controlled more than 80% of the market, while the next largest firm in terms of market share controlled only 4% of the market.[124] Live Nation had been the largest concert promoter and owned or operated about 70 major concert venues in the United States, and, in 2008, Live Nation was Ticketmaster's largest customer.[125] After spending more than two years "evaluating, licensing, and developing" a platform that could compete with Ticketmaster's, in December 2008, Live Nation entered the market for primary ticket services.[126] While Ticketmaster's other competitors faced high barriers to entry—including Ticketmaster's established reputation that made it difficult for new entrants to secure long-term contracts with major concert venues—Live Nation was vertically integrated, which enabled it to achieve sufficient scale by simply ticketing its own venues. Unlike Ticketmaster's other competitors, Live Nation did not need to secure long-term contracts with other major concert venues. Live Nation was therefore best positioned to challenge Ticketmaster; indeed by 2009, Live Nation had captured more than 15% of the market.[127] Less than two months after Live Nation began ticketing with its new platform, Ticketmaster sought to acquire Live Nation.[128]

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123. *See* Katz & Shelanski, *supra* note 9, at 29. In addition, monopolists may invest resources to obtain intellectual property rights with the sole purpose of excluding rivals by making entry more difficult. Moreover, Katz and Shelanski suggest that "a firm that lacks rivals against which to benchmark itself may be a less efficient innovator." *Id.*

124. Competitive Impact Statement, United States v. Ticketmaster Entertainment, Inc., NO. 1:10-CV-00139, 2–3, 8–9 (D.D.C. Jan. 25, 2010), *available at* http://www.justice.gov/atr/cases/f254500/254544.pdf; Complaint, United States v. Ticketmaster Entertainment, Inc., NO. 1:10-CV-00139, ¶¶ 2, 21 (D.D.C. Jan. 25, 2010), *available at* http://www.justice.gov/atr/cases/f254500/254552.pdf.

125. Competitive Impact Statement, United States v. Ticketmaster Entertainment, *supra* note 124, at 4–5, 9.

126. Complaint, United States v. Ticketmaster Entertainment, Inc., *supra* note 124, ¶ 3.

127. Competitive Impact Statement, United States v. Ticketmaster Entertainment, Inc., *supra* note 124, at 9–11.

128. *Id.* at 11.

After reviewing the merger, the DOJ concluded that the loss of competition between Ticketmaster and Live Nation would likely result in higher prices and less innovation.[129] At the same time, the parties asserted that the merger would cut out the number of middlemen that needed to be compensated, which would ultimately reduce the prices paid by venues for primary ticketing services and by consumers for tickets.[130] To remedy the anticompetitive effects of the merger, the DOJ proposed a multi-pronged remedy, which included requiring Ticketmaster to provide a third party, Anschutz Entertainment Group, Inc. ("AEG"), with its own branded website based on Ticketmaster's technology "including any upgrades and enhancements" to the technology for up to five years.[131] As with a traditional license, AEG is required to pay a "royalty" for use of the technology, but that royalty is below the competitive price Ticketmaster otherwise charges.[132] In addition, Ticketmaster was required to provide AEG with "an option to acquire a perpetual, fully paid-up license to the then-current version of Ticketmaster's [technology], including a copy of the source code," as well as technical support for the first six months.[133] Because the merger was anticipated to cause harmful effects to innovation, a compulsory license to Ticketmaster's intellectual property, aimed at restoring both the product and innovation competition lost as a result of the merger, was justified.

C. Anticompetitive Effects to Static Price and Output Effects; Expected Benefits to Innovation

The hardest case is presented by those mergers that are likely to raise prices or reduce output, while also promising to enable innovation that is possible only through merger.

In this case, a more thorough analysis is warranted. While a compulsory license can be effective in replacing the competition lost as a result of the merger, thereby preventing prices from rising

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129. *Id.* at 2, 11. Specifically, the DOJ concluded that the merged firm would have "reduced incentives to develop new features." *Id.* at 11.

130. *Id.* at 12. It should be noted that the agency did not "fully credit" the parties' efficiency claims "because they each could realize many of the asserted efficiencies without consummating the proposed transaction." The Ticketmaster-Live Nation merger was reviewed under the 1992 Merger Guidelines, which, like the revised Merger Guidelines, arguably credit only those efficiencies that are "merger-specific." Although beyond the scope of this Article, this raises the noteworthy issue of why the merger was allowed to proceed at all, even if the anticompetitive effects of the merger could be effectively remedied.

131. *Id.* at 13–14.

132. *Id.* at 14.

133. *Id.*

and output from decreasing, at the same time, it can undercut the merging firms' incentives to innovate, particularly if the necessary investment is significant and the expected return significantly diminished with increased competition. The Genzyme–Novazyme merger is an example of a merger that presented difficult issues regarding the merger's net value, warranting a more thorough analysis.

One particularly difficult case, mentioned above, is where the merged firm's innovation is likely to create a new product in a winner-take-all market. On the one hand, increased competition at the existing product level can prevent prices for those products from rising. In addition, more competition at the innovation level may deliver the new product to consumers sooner and allow consumers to choose the superior technology.[134]

On the other hand, if the market is truly winner-take-all, the merged firm faces the risk of losing that competition and recouping very little, if any, of its investment. As a result, the merging firms may choose to abandon the project (or the merger) completely, resulting, possibly, in a complete loss of the innovation.

If the enforcement agency truly believes that the innovation benefits are worth preserving, one possible solution is a compulsory license with a field of use restriction, permitting the licensee to practice the inventions disclosed in the patent or patents for the limited purpose of competing in the present product market, but prohibiting the licensee from practicing the invention for any other purpose.[135]

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134. This is not necessarily the case. The winning product is not always the superior product for a number of reasons, including band-wagon effects, first-mover advantage, or availability of complementary products. For example, in the war between the Betamax and VHS standard, Betamax was considered the superior technology, but the standard lost out to VHS for at least a couple of reasons, including the limited availability of complementary products (*i.e.*, recorded programs on the Betamax standard) and the 60-minute tape length. *See, e.g.*, Peter Passell, *Why the Best Doesn't Always Win*, N.Y. TIMES, May 5, 1996 (Magazine).

135. *Cf.* U.S. DEP'T OF JUSTICE, ANTITRUST DIVISION POLICY GUIDE TO MERGER REMEDIES, *supra* note 69, at 11 n.23 ("When a patent covers the right to compete in multiple product or geographic markets, yet the merger adversely affects competition in only a subset of these markets, the Division will insist on the sale or license of rights necessary to effectively preserve competition in the affected markets. *In some cases, this may require that the purchaser or licensee obtain the rights to produce and sell only the relevant product*. In other circumstances, it may be necessary to give the purchaser or licensee the right to produce and sell other products (or use other processes), where doing so permits the realization of scale and scope economies necessary to compete effectively in the relevant market." (emphasis added)).

This solution has its own limitations, however. To the extent the merged firm continues to make improvements to its existing product—while attempting to develop an entirely new product—the licensee will likewise need to make improvements to the existing product to remain competitive. Often, those improvements will build upon—and therefore continue to practice—the existing technology, such that the licensee will be unable to further innovate without a license permitting those improvements. In theory, the original license could be further tailored to permit such improvements; in practice, this may be very difficult, as the line between where an improvement ends and a new product begins may be hard to draw.

CONCLUSION

It is possible that the dynamic effects of a compulsory license are, in fact, insubstantial. This is possible for at least two reasons. First, although a compulsory license may diminish the merging firms' incentives to innovate, the incentives may nonetheless be sufficiently great that very few, if any, R&D projects are abandoned. Alternatively, it is possible that, even if a compulsory license forces potential merging partners to abandon a merger or a potential R&D project, those projects were not going to enhance consumer welfare significantly anyway. Given the agencies' apparent risk aversion and preference for false positives (mistakenly preventing a procompetitive merger) over false negatives (mistakenly allowing an anticompetitive merger), the loss of those low-valued R&D projects may be of no concern.[136]

However, in the absence of any analysis by the agencies, it is difficult to know. Therefore, at least in the short run, the agencies should undertake a more thorough, fact-intensive analysis of the effects of a compulsory license on the relevant market or markets. The results of these analyses, together with the actual effects in the relevant markets, will provide fodder for further, empirical analyses. From these analyses, the agencies can draw fact-based conclusions about the effects of such a remedy and create useful presumptions that can be used in future evaluations of a potential merger and the effectiveness of a compulsory license.

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136. *See supra* note 102 (discussing the agencies' apparent preference for false positives).