

FIVE NOT SO EASY PIECES TO MAKE ANTITRUST WORK FOR INNOVATION



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I. INTRODUCTION

The movie “Five Easy Pieces” chronicles the struggles of a young man who abandons the microcosm of classical musicians in which he was raised to find his way in a hardscrabble world. The protagonist has many misadventures and the movie ends on a note of profound uncertainty about his future. In a not entirely dissimilar sense, antitrust enforcement matured in a microcosm of neoclassical price theory and is struggling to find its way in the hardscrabble world of high technology. Whether antitrust policy will become an effective tool to promote innovation is also as yet uncertain.

The U.S. Congress established the Antitrust Modernization Commission (“AMC”) to consider how antitrust law and enforcement can best serve consumer welfare in the global, high-tech economy that exists today and to assess whether existing antitrust laws are up to that task.² After three years of staff effort and many weeks of hearings, the Commission issued a Report which recognized that antitrust enforcers should carefully consider market dynamics in assessing competitive effects, but concluded that “[t]here is no need to revise the antitrust laws to apply different rules to industries in which innovation, intellectual property, and technological change are central features.”³

At one level these are not controversial findings. There is no disagreement that innovation is a key determinant of consumer welfare and that antitrust policy should be cognizant of the effects of mergers and acquisitions and firm conduct on innovation incentives. There is no need to revise the U.S. antitrust laws because they are sufficiently vague to apply flexibly to most any industry circumstance. They do not define competition, harm to competition, or monopolization and allow broad scope for courts to take idiosyncratic features of industries into account including the effects of conduct and market structure on industry dynamics and consumers.

Nonetheless, the AMC was unjustifiably sanguine in its conclusions because high technology industries have characteristics that are difficult to address following generally accepted antitrust principles. Antitrust enforcement developed over more than a century to embrace neoclassical price theory with its emphasis on short-run allocative efficiency, which applauds measures that move prices closer to marginal production costs. While this evolution has had positive effects for consumer-friendly enforcement in “old economy” industries, it limits the ability of courts to enforce antitrust laws to promote innovation in high technology “new economy” industries. These features include: the relative importance of competition to create new products and services compared to price competition; a typically large gap between marginal cost and average cost, which makes pricing at or near marginal cost a questionable objective; the potential for innovation to disrupt markets, which severs links that might otherwise connect existing market structures to future competition; conflicts between the need to protect information to

² *Antitrust Modernization Commission: Report and Recommendations*, April 2007 at 1.

³ AMC Report at 9.

encourage its creation and the social value of disseminating information widely; the role of network effects and platforms; and other complications such as standards, complementors, and interoperability that can be difficult to address following historical precedents.

My focus in this note is on merger policy for new economy industries, which I define as industries for which the development of new products or technologies is a critical strategic instrument.⁴ I identify five obstacles (“not so easy pieces”) that hinder sound antitrust enforcement for mergers in new economy industries.

II. LIMITED ECONOMIC THEORY AND EMPIRICAL EVIDENCE

There is not a large body of theoretical and empirical evidence that addresses the impact of mergers or firm conduct on innovation. This might surprise students of law and economics because there is a very large economic literature on competition and innovation.⁵ The problem for merger policy is that relatively few of these studies focus on mergers and a merger is not the same as a reduction in competition. Absent economics of scale or scope, a merger does not change the resources available for research and development, although it can change incentives to apply those resources to develop a new product or technology. In contrast, a reduction in competition removes R&D resources from an industry, which can have different effects for R&D incentives compared to a merger.

Several recent theoretical studies develop a foundation to evaluate how a merger changes the unilateral incentives⁶ of the merging parties to invest in R&D.⁷ These studies generally find that mergers lower unilateral investment incentives for R&D, absent efficiencies, spillovers or other industry characteristics that limit the ability of innovators to profit from their discoveries. Mergers create “downward innovation pressure,” much as they create “upward pricing pressure.”⁸ However, these studies have numerous limitations and have not been validated with empirical evidence.

Most of the recent theoretical studies that address merger incentives for innovation adopt a highly simplified description of industry dynamics. Typically, they assume only two time periods: an initial period in which firms invest in R&D and a subsequent period in which they compete in prices. A two-period model abstracts from important industry dynamics that can affect innovation incentives. For example, innovation incentives can differ greatly for firms that are close to or far from a technological frontier, a proposition that is supported by economic theory and empirical evidence and which can have implications for merger effects.⁹ These asymmetries are typically absent in two-period models, which typically assume that firms have symmetric innovation capacities in the R&D stage and ignore asymmetries that may develop when firms have different payoffs from their research and development efforts.

4 These are typically industries with high research and development (“R&D”) intensities as measured by the ratio of R&D expenditures to sales.

5 Philippe Aghion & Jean Tirole label the competition-innovation relationship the second most studied topic in the field of industrial organization, second only to the price-competition relationship. See Philippe Aghion & Jean Tirole, *The Management of Innovation*, 109 *Quarterly J. Econ.* 1185, 1195 (1994).

6 Unilateral incentives refer to incentives that do not assume responses by non-merging parties. See U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010 at § 6.

7 See, e.g. Igor Letina, *The Road Not Taken: Competition and the R&D Portfolio*, 47 *RAND J. Econ.* 433 (2016); Michael A. Salinger, *Net Innovation Pressure in Merger Analysis*, available at <https://ssrn.com/abstract=3051249> (2016); Massimo Motta & Emanuele Tarantino, *The Effect of Horizontal Mergers, When Firms Compete in Prices and Investments*, UPF Working Paper No.1579, August 30 (2017); Giulio Federico, Gregor Langus & Tommaso Valletti, *Horizontal Mergers and Product Innovation: An Economic Framework*, 59 *Int. J. Industrial Org.* 1 (2018); and Ángel L. López & Xavier Vives, *Overlapping Ownership, R&D Spillovers, and Antitrust Policy*, *J. Political Economy* (forthcoming).

8 For a description of “upward pricing pressure,” see Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10 *B.E. J. Theoretical Econ.: Policies and Perspectives* 1 (2010) and the *Horizontal Merger Guidelines* at § 6.1.

9 See, e.g. Philippe Aghion, Nick Bloom, Richard Blundell, Rachel Griffith & Peter Howitt, *Competition and Innovation: An Inverted-U Relationship*, 120 *Q. J. Econ.* 701 (2005); Philippe Aghion, Richard Blundell, Rachel Griffith, Peter Howitt & Susanne Prantl, *The Effects of Entry on Incumbent Innovation and Productivity*, 91 *Rev. Econ. & Stat.* 20 (2009); and Nicholas Bloom, Mirko Draca & John Van Reenen, *Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity*, 83 *Rev. Econ. Stud.* 87 (2016).

In addition to the complications from industry dynamics, simple models abstract from efficiencies that may lower the cost or increase the effectiveness of R&D expenditures and from spillovers or other industry characteristics that affect the ability of innovators to profit from their discoveries. Efficiencies and appropriation benefits can reverse predictions that mergers exert downward innovation pressure.¹⁰ More research is needed to identify the circumstances under which these effects are likely to be quantitatively significant.

III. ANTITRUST'S OBSESSION WITH MARKET DEFINITION

It did not take long for courts charged with enforcing the antitrust laws to require identification of relevant markets to evaluate allegations of monopolization or attempted monopolization.¹¹ In 1911 the Supreme Court interpreted the Sherman Act's prohibition of monopolization to have "both a geographical and distributive significance."¹² The 1914 Clayton Act prohibited acquisitions whose effects may be to constrain commerce in any section or community or tend to create a monopoly in any line of commerce.¹³ The phrase "line of commerce" invites market definition.

Following William Baxter, mergers can raise distinct concerns in three different categories of market activity. They can have concerns for "today's products" that are presently being delivered in the marketplace, the activity of R&D, and "tomorrow's products," the goods and services that may eventually be delivered as a consequence of successful R&D.¹⁴ The traditional approach to market definition addresses only the delineation of markets for "today's products." With respect to the activity of R&D, the *Antitrust Guidelines for the Licensing of Intellectual Property* define a "research and development market," which "consists of the assets comprising research and development related to the identification of a commercializable product, or directed to particular new or improved goods or processes, and the close substitutes for that research and development."¹⁵ However, with the narrow exception of contract research and development, R&D is not a traded product or service.¹⁶

The effects of mergers on "tomorrow's products" also can be difficult to address within the conventional contours of market definition. Suppose it is likely that a merger of firms Alpha and Beta will reduce R&D investment and likely delay the production of a new technology to identify genetic defects. There may be no market for the technology if it does not presently exist or its future boundaries may be difficult to assess. If there is a discernible market for the technology, the effect of the merger may be to delay output in that market, which is arguably different from lessening competition in an existing or future market.

At least one court has opined that a firm cannot be held liable for antitrust harm in a market that does not presently exist. In *SCM Corp. v. Xerox Corp.*, a district court heard a complaint that Xerox engaged in various practices that excluded SCM from markets for plain and coated paper copiers, including acquisitions of patents. While noting that patent acquisitions are not exempt from Section 7 of the Clayton Act, the judge concluded that "Liability for retrospective money damages cannot be predicated under § 7 upon a patent acquisition made prior to the existence of a relevant product market."¹⁷ Even if *SCM v. Xerox* is not the law of the land, market definition is not a particularly helpful tool to evaluate harm to innovation. It is a challenge to apply a hypothetical monopolist test to a market that does not yet exist. It is difficult to translate a "small but significant and non-transitory increase in price" to conduct that delays a new technology.

10 See, e.g. Vincenzo Denicolò & Michele Polo (2018), Duplicative Research, Mergers and Innovation, 166 *Econ. Letters* 56 (2018) for an example of R&D efficiencies from mergers. For a discussion of merger appropriation benefits, see, e.g. Vincenzo Denicolò & Michele Polo, The Innovation Theory of Harm: An Appraisal, (March 22, 2018), available at <https://ssrn.com/abstract=3146731>; Bruno Jullien & Yassine Lefouili, Horizontal Mergers and Innovation (August 1, 2018), available at <https://ssrn.com/abstract=3135177>; Marc Bourreau & Bruno Jullien, Mergers, Investment and Demand Expansion, 167 *Econ. Letters* 136 (2018); and Richard Gilbert, Competition, Mergers and R&D Diversity, (October 8, 2018), available at <https://ssrn.com/abstract=3190478>.

11 For a discussion of the evolution of market definition in antitrust cases, see, e.g. Gregory J. Werden, The History of Antitrust Market Delineation, 76 *Marq. L. R.* 123 (1992).

12 *Standard Oil Co. v. United States*, 221 US 1, 61 (1911).

13 Enacted October 15, 1914, codified at 15 U.S.C. §§ 12–27, 29 U.S.C. §§ 52–53.

14 William F. Baxter, The Definition and Measurement of Market Power in Industries Characterized by Rapidly Developing and Changing Technologies, 53 *Antitrust L.J.* 717, 717-718 (1984).

15 U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property*, January 12, 2017 at § 3.2.3.

16 At least one U.S. court rejected a market for R&D because the complaint did not identify one or more product markets consisting of reasonably interchangeable goods. See *Golden Gate Pharmacy Services, Inc. v. Pfizer, Inc.*, No. C-09-3854 (N.D. Cal. Dec. 2, 2009), aff'd 433 Fed. Appx. 598 (May 19, 2011).

17 463 F. Supp. 983, aff'd 645 F.2d 1195, 1210.

The fact that market definition is difficult, and perhaps impossible, for innovation does not mean that antitrust enforcement should ignore innovation. Market definition can obscure, rather than inform, the analysis of competitive effects in high technology industries for which existing market structures are highly imperfect predictors of future competition. Louis Kaplow, an accomplished scholar of law and economics, wrote that market definition is “impossible and counterproductive” even for existing goods and services because “there does not exist a valid means of inferring market power from market shares” and “it is impossible to determine which market definition is superior without already formulating one’s best estimate of market power, rendering the exercise pointless.”¹⁸ The 2010 revision of the U.S. Department of Justice and Federal Trade Commission *Horizontal Merger Guidelines* subtly suppresses the role of market definition in agency guidance by transposing the order of “market definition” and “competitive effects,” placing the latter before the former and adding that “The Agencies’ analysis need not start with market definition.”¹⁹

Perhaps the historically central role of market definition in antitrust analysis is not fatal for the evaluation of harms to innovation. But the antitrust Agencies will have to develop new techniques to evaluate these harms and may face opposition from courts that expect the sophisticated approaches to product and geographic market definition that have been developed for “today’s” products and services.

IV. STANDARD OF PROOF TO ESTABLISH ANTITRUST HARM

Courts increasingly require antitrust plaintiffs to empirically demonstrate alleged antitrust harms. In merger cases this may take the form of an econometric analysis relating prices to market competition as the Federal Trade Commission did in its 1997 challenge to the merger of two office supply superstore chains, Office Depot and Staples.

A key issue in the analysis of the proposed Office Depot/Staples merger was whether the superstores (Office Depot, Staples, and OfficeMax) were more effective competitors for some types of office supplies than other retailers, such as Target and Wal-Mart. By identifying geographic pricing zones with different numbers of superstores and other retailers, the FTC could distinguish the effects of competition from superstores from competition from other retailers and concluded that the merger would significantly increase prices in many geographic regions.²⁰

It is unlikely that innovation harms can be predicted with a similar level of precision. Unlike retail competition, R&D competition is not geographically specific. It would be difficult, and possibly misleading, to identify regions of the country where merging firms compete in R&D and differentiate them from other regions where they do not compete in R&D. Research and development efforts may be local but its effects for innovation are potentially global. Even if local or temporal differentiation in R&D efforts might exist, it would be challenging to identify its effects. Innovation is inherently uncertain and difficult to measure. Common indicators, such as R&D expenditures and patent counts, are only indirectly related to innovation.

Without a way to calculate the effect of industry competition on innovation, antitrust enforcers are likely to resort to surrogate indicators, such as corporate documents that discuss R&D intentions. But corporate documents are imperfect predictors of future conduct and are susceptible to strategic manipulation if corporate executives appreciate how their records might influence enforcement outcomes. Empirical studies, buttressed by sound economic theory, which measure the effects of historical merger activity in an industry on innovation outcomes are likely to be an important information source if antitrust authorities pursue enforcement actions that turn on innovation effects. As noted, the empirical record is weak and much more should be done to accumulate relevant knowledge to support enforcement actions.

Effective antitrust enforcement for innovation will require courts to balance the costs of over-enforcement and under-enforcement. Plaintiffs bear the burden to prove their allegations and it is socially costly to hold parties liable for conduct that is unlikely to create harm. However, it would be unwise to abandon merger enforcement for innovation merely because effects cannot be predicted with a high degree of certainty. Decisions not to challenge mergers that may harm innovation are also subject to error and can have high resulting social costs.

18 Louis Kaplow, Market Definition: Impossible and Counterproductive, 79 *Antitrust L.J.* 361, 361 (2013).

19 *Horizontal Merger Guidelines* at 7.

20 See Orley Ashenfelter, David Ashmore, Jonathan B. Baker, Suzanne Gleason & Daniel S. Hosken, Empirical Methods in Merger Analysis: Econometric Analysis of Pricing in *FTC v. Staples*, 13 *Int. J. of Econ. of Bus.* 265 (2006).

V. TREATMENT OF EFFICIENCIES AND APPROPRIABILITY

While mergers can reduce the unilateral incentives of the merging parties to invest in R&D, they can have other impacts that promote innovation. Mergers can have efficiency benefits that enable the merged firm to conduct R&D more effectively. They can eliminate redundant R&D expenditures, allowing the merged firm to reduce costs and perhaps re-direct R&D effort to other productive activities. The merged firms also may have complementary assets and technological expertise that can increase the productivity of R&D. Furthermore, a merged firm can benefit from intra-firm spillovers that allow each merger partner to profit from R&D efforts by the other partner. In addition, a merger can allow the merged firm to appropriate greater value from its discoveries than the merging parties can realize individually by increasing price and output in markets for new products and services and by limiting informational spillovers that allow rivals to profit from its discoveries.

The AMC Report recommended that the FTC and the Antitrust Division of the DOJ should give substantial weight to evidence demonstrating that a merger will enhance consumer welfare by enabling the companies to increase innovation.²¹ The Horizontal Merger Guidelines acknowledge that mergers can have efficiency benefits for research and development. However, the Guidelines also state that “Research and development cost savings may be substantial and yet not be cognizable efficiencies because they are difficult to verify or result from anticompetitive reductions in innovative activities.”²² Of course, antitrust authorities should recognize efficiencies only if they are verified and cost-savings do not offset anticompetitive effects if they are integral with harm to competition. However, courts historically have been reluctant to accept efficiency claims as a defense in merger cases and there is little justification to impose a higher threshold of proof for R&D efficiencies.²³

The Horizontal Merger Guidelines add that “The Agencies also consider the ability of the merged firm to appropriate a greater fraction of the benefits resulting from its innovations,”²⁴ but the Guidelines do not detail how mergers may increase appropriation or where the burden of proof lies to establish appropriation effects. A merger can increase appropriation by increasing the profits from an innovation²⁵ or by internalizing spillovers that would otherwise dilute innovation incentives. The profit from an innovation can increase if the merger increases the future price or output of the innovation. Higher prices enhance welfare only if the positive effects from greater innovation (or higher quality) more than compensate for the consumer harm from higher prices. Greater output is a consumer benefit, but the mechanism that promotes higher output needs to be explicated because, all else equal, higher prices tend to lower output.

Spillovers have complicated effects for merger incentives. Spillovers allow rivals to imitate discoveries without bearing all of the costs of R&D. These external spillovers reduce the ability of innovators to profit from discoveries and therefore lower innovation incentives. Mergers can promote innovation by reducing the number of rivals that can imitate a discovery. Spillovers that are internal to the merged firm allow each merger party to benefit from discoveries made by the other party. These internal spillovers can allow the merged firm to achieve greater innovation benefits than each party could achieve on its own or allow the merged firm to amortize the cost of R&D over a larger output.

A key question is who bears the burden to evaluate appropriation benefits from a merger, including the effects from external and internal spillovers. The merging parties correctly have the burden to demonstrate cost-saving efficiencies because they have more information than antitrust enforcers about the ability of a merger to lower their costs, including R&D expenditures. It is unclear whether the merging parties have greater information about the ability of a merger to achieve appropriation benefits. The parties may have given little thought to quantifying appropriation benefits in their normal course of business and arguably antitrust enforcers could have greater competence to explain how a merger would or would not facilitate appropriation. The ability to mount a successful appropriation defense depends on the assignment of the burden to justify appropriation benefits, and courts have not resolved this issue.

21 AMC at 10.

22 HMG at 31.

23 William J. Kolasky & Andrew R. Dick, *The Merger Guidelines and the Integration of Efficiencies Into Antitrust Review of Horizontal Mergers*, 71 *Antitrust L. J.* 207, 209 (2003). (Courts have been slow to accept efficiencies as an integral part of the competitive effects analysis of mergers).

24 HMG at 31.

25 The relevant measure is the incremental profit from invention relative to the profit if a firm does not invent. A merger can increase the incremental profit from invention under some circumstances even if it does not increase the gross profit from invention.

VI. EFFECTIVENESS OF REMEDIES TO RESTORE INNOVATION INCENTIVES

The most common outcome of a merger challenge brought by an antitrust agency is a consent decree in which the merging parties agree to abide by specified structural or behavioral conditions. These may include some combination of asset divestitures, supply commitments, and technology licensing obligations. There is an economics literature that addresses whether these consent agreements have prevented price increases for mergers and acquisitions.²⁶ The U.S. FTC and other enforcement agencies have conducted their own retrospective analyses of merger remedies,²⁷ but they have not examined whether consent decrees have restored innovation incentives for cases that alleged innovation concerns. It is difficult to restore innovation incentives that are lost from a merger. A successful divestiture requires sufficient capital, labor, technical experience, and intellectual property rights for the recipient of the divested assets to replace lost R&D, along with the will to apply these assets to innovate in technical areas that the merging parties would have pursued if they did not merge.

Spinning off a division of the merged company to a third party may not be sufficient to achieve these goals. Antitrust authorities cannot order employees of the merging companies to move to the designated recipient of the divested assets. Skilled personnel may prefer a different employer, location, or occupation. One study of acquisitions in the pharmaceutical industry found that only 22 percent of the employees that were listed as inventors on the acquired company's patents moved to the acquiring company.²⁸ Furthermore, the merged company might retain intellectual property rights or exclusive relationships that impose barriers to successful innovation by the recipient of the divested assets.

If further study demonstrates that partial remedies often fail to remedy alleged innovation harms from mergers, the antitrust authorities can refuse to accept partial remedies and instead unconditionally challenge mergers that threaten innovation. However, the threat of an unconditional challenge can cause further harm. Suppose firms Alpha and Beta plan to merge and have overlapping R&D activities in one of their many divisions. If they anticipate that a reviewing agency will move to block the merger because the agency cannot design an effective remedy, they may "fix it first" and spin off the troublesome division to a third party. Of course, there is no reason to expect that the fix orchestrated by the merging parties would be any more effective than a remedy negotiated with the reviewing agency.

The solution to the problem of ineffective remedies to address innovation harms is better information about the types of remedies that work and those that fail. Studies should also explore the effectiveness of different types of remedies, such as compulsory licensing of intellectual property as an alternative to asset divestitures.

VII. THE ROAD AHEAD

The Report of the AMC concluded that "No substantial changes to merger enforcement policy are necessary to account for industries in which innovation, intellectual property, and technological change are central features."²⁹ At a very general level, this conclusion is correct. But this note explains that courts and antitrust enforcers have a lot of work ahead to make merger enforcement an effective policy tool to promote innovation.

26 See, e.g. John Kwoka, Daniel Greenfield & Chengyan Gu, *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U.S. Policy*, MIT Press (2015).

27 See, e.g. U.S. Federal Trade Commission, *The FTC's Merger Remedies 2006-2012: A Report of the Bureau of Competition and Economics*, January 2017.

28 Colleen Cunningham, Florian Ederer & Song Ma, *Killer Acquisitions* (August 28, 2018), available at <https://ssrn.com/abstract=3241707>. This percentage would not indicate a loss of future innovation competition if patentees that went elsewhere more than compensated for the loss of innovation by the acquiring company.

29 AMC Report at 9.

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