

UC Berkeley

UC Berkeley Previously Published Works

Title

Merging Innovation into Antitrust Agency Enforcement of the Clayton Act

Permalink

<https://escholarship.org/uc/item/8c68x088>

Journal

GEORGE WASHINGTON LAW REVIEW, 83(6)

ISSN

0016-8076

Authors

Gilbert, Richard J

Greene, Hillary

Publication Date

2015

Peer reviewed

Merging Innovation into Antitrust Agency Enforcement of the Clayton Act

Richard J. Gilbert and Hillary Greene***

ABSTRACT

The treatment of innovation within the merger context by U.S. Antitrust Agencies continues to evolve, with regard to both general statements of enforcement policy and specific enforcement decisions. The respective merger guidelines issued by the Department of Justice and the Federal Trade Commission did not consider potential impacts on innovation or research and development until 1982, and then only in passing. By contrast, their joint 2010 Horizontal Merger Guidelines devote an entire section to innovation issues. This Essay examines both the frequency and manner with which the Antitrust Agencies invoke innovation-based concerns within their respective merger challenges from 2004–2014. It finds that both the DOJ and FTC allege adverse innovation effects in a very large fraction of their respective merger challenges in high-R&D-intensity industries. After exploring possible explanations, the Essay recommends that the Agencies describe their innovation concerns with greater specificity when merger challenges allege harm to innovation.

TABLE OF CONTENTS

INTRODUCTION	1920
I. PERSPECTIVES ON INNOVATION, MARKET POWER, AND COMPETITION	1922

* Professor Emeritus, Department of Economics, and Professor of the Graduate School, University of California, Berkeley. Richard J. Gilbert served as Deputy Assistant Attorney General for Economics at the Antitrust Division from 1993–1995, where he led an effort that developed the 1995 *Antitrust Guidelines for the Licensing of Intellectual Property*, issued jointly by the Department of Justice and the Federal Trade Commission.

** Professor of Law, University of Connecticut School of Law. Hillary Greene served as Project Director for Intellectual Property for the Federal Trade Commission (Office of the General Counsel, Policy Studies) from 2002–2003.

We are grateful to Rebecca Clegg, Robert Fontaine, Kun Huang, Erin Rubin, and Gregory Wuennenberg for excellent research assistance, to Maria Jorge for excellent administrative assistance, and to Jonathan Baker, John B. Kirkwood, Joseph Stiglitz, Dennis A. Yao, and participants at *The FTC at 100: Centennial Commemorations and Proposals for Progress symposium* (The George Washington University Law School, November 2014), Clayton Act 100th Anniversary Symposium (Federal Trade Commission, December 2014), and the Industrial Organization Workshop (U.C. Berkeley Economics Department, March 2015) for helpful comments. Finally, we extend our thanks to *The George Washington Law Review*, and in particular, Senior Projects Editor Kolya D. Glick, Senior Executive Editor Thaddeus Ewald, and Articles Editor Chelsea Pizzola, for their excellent stewardship of *The FTC at 100* Symposium and this Essay.

II. ANTITRUST AGENCIES' POLICY STATEMENTS	
REGARDING INNOVATION.....	1926
A. <i>Guidelines in the 1960s</i>	1927
B. <i>Guidelines in the 1980s</i>	1928
C. <i>Guidelines in the 1990s</i>	1928
D. <i>Guidelines in 2010</i>	1930
III. ANTITRUST AGENCIES' ENFORCEMENT RECORDS	
REGARDING INNOVATION.....	1931
A. <i>The Frequency of Innovation-Related Challenges</i>	1932
B. <i>The Treatment of Innovation-Related Challenges</i>	1940
CONCLUDING THOUGHTS REGARDING FURTHER GUIDANCE...	1943
APPENDIX: INDUSTRY SECTOR R&D INTENSITY.....	1945
A. <i>High R&D Intensity</i>	1945
B. <i>Moderate R&D Intensity</i>	1945
C. <i>Low R&D Intensity</i>	1946

INTRODUCTION

The Sherman Act¹ and the Clayton Act² are the Ten Commandments of U.S. antitrust law. Like the Ten Commandments, they describe in very general terms what parties “shall not do,” and they have their origins in a time when the world was very different than it is today. Many of the industries that power today’s economy did not exist when Congress passed the Clayton Act in 1914 and could not even have been anticipated. There was no Internet. A social network was a neighborhood. The microchip or its predecessor, the transistor, had not been invented, and it was two decades before Alan Turing would develop the concept of the modern computing machine.³ Other industries that provide products and services that are critical to the modern economy were in their infancy in 1914. The first Model T automobile had rolled off one of the first automated assembly lines only six years earlier.⁴ It was only a decade since the Wright Brothers’ first flight.⁵ The vacuum tube amplifier had been invented only eight

1 Sherman Antitrust Act, 15 U.S.C. §§ 1–7 (2012).

2 Clayton Act of 1914, 15 U.S.C. §§ 12–27 (2012).

3 See Andrew Hodges, *Computer Science: Beyond Turing’s Machines*, SCI., Apr. 2012, at 163, 163; Walter Isaacson, *Microchips: The Transistor Was the First Step*, BLOOMBERGBUSINESS (Dec. 4, 2014), <http://www.bloomberg.com/bw/articles/2014-12-04/microchips-the-transistor-was-the-first-step>.

4 See *Ford’s Famous Model T Automobile Chugged into History in 1908*, CHI. TRIB., Feb. 17, 1963, at E4.

5 See Stephen E. Massengill, “By Dauntless Resolution and Unconquerable Faith”: Selected Anniversary Celebrations at the Site of the Wright Brothers’ First Flight, 1928–1978, 80 N.C. HIST. REV. 405, 405 (2003).

years earlier,⁶ and Thomas Edison had only recently demonstrated the first talking motion picture.⁷

“Innovation” is defined as “something new or different introduced.”⁸ Antitrust has long acknowledged the importance of innovation but has struggled to incorporate it within the contours of its analyses. Perhaps nowhere is this effort more apparent than with regard to mergers. This Essay explores the U.S. Antitrust Agencies’ evolution in their treatment of “innovation” under section 7 of the Clayton Act as expressed in their enforcement policy guidelines and as implemented in their actual enforcement records.

Part I briefly introduces the seminal positions, as exemplified by Joseph A. Schumpeter and Kenneth J. Arrow, regarding the key relationships among innovation, market structure, and competition. Although the effects of market structure and competitive conditions on incentives to innovate are complex, economic theory supports a conclusion that mergers may reduce incentives for innovation in some circumstances while increasing incentives for innovation in other circumstances. Part II discusses the treatment of innovation in the Agencies’ variously promulgated enforcement guidelines and identifies key industry attributes that should affect the relationship between competition and innovation. Part III reviews the enforcement history of the Department of Justice’s Antitrust Division (“DOJ”) and the Federal Trade Commission (“FTC”) regarding mergers that may have affected innovation in the eleven-year period between 2004 and 2014.

Since 2004, the Agencies have identified innovation concerns in approximately one-third of their merger challenges.⁹ A fraction of these mergers occurred in industries characterized by relatively high research and development (“R&D”) intensity, as measured by the ratios of R&D expenditures to sales or R&D expenditures per worker.¹⁰ Within the context of challenged mergers in highly R&D-intensive

⁶ See Lee De Forest, *The Audion—Detector and Amplifier*, 12 PROC. INST. RADIO ENGINEERS, Mar. 1914, at 15, reprinted in 86 PROC. INST. ELECTRICAL AND ELECTRONICS ENGINEERS 1881 (1998).

⁷ See *Motion Pictures*, THE THOMAS A. EDISON PAPERS, <http://edison.rutgers.edu/pictures.htm> (last updated Feb. 20, 2012).

⁸ RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE 984 (2d ed. 1987). Some define “invention” as the creation of a new product or process and “innovation” as an improvement of or significant contribution to an existing product or process. See, e.g., Tom Grasty, *The Difference Between “Invention” and “Innovation,”* IDEA LAB (Mar. 29, 2012), <http://www.pbs.org/idealab/2012/03/the-difference-between-invention-and-innovation086/>. This Essay refers to an inventor as an entity that creates an innovation, but otherwise uses the terms interchangeably.

⁹ See *infra* Part III.A.

¹⁰ See *infra* notes 76–77 and accompanying text.

industries, the Agencies identified innovation concerns in nearly all of their merger challenges. This observation regarding the frequency of innovation concerns raised within mergers in high technology industries may indicate the Agencies are adept at challenging only mergers in contexts that are likely to harm innovation. However, some mergers in high-R&D-intensity industries may warrant a challenge for static welfare harms but not support an allegation of harm to innovation. That would be the case if the merger is unlikely to harm innovation or if the merger may promote innovation, but the benefit is unverified or not sufficient to compensate for likely price increases. Part IV offers some tentative observations, using the 2010 Merger Guidelines as a primary point of reference, regarding how the Agencies can better address innovation-based concerns under section 7 of the Clayton Act.

I. PERSPECTIVES ON INNOVATION, MARKET POWER, AND COMPETITION

Section 7 of the Clayton Act proscribes mergers “in any line of commerce or in any activity affecting commerce in any section of the country, [for which] the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly.”¹¹ Its enforcement largely has focused on what constitutes “a substantial lessening of competition.”¹² The generally accepted view is that this phrase refers to an increase in market concentration that facilitates the use of market power to raise the (quality-adjusted) price of a good or service.¹³ However, price is but one dimension of competition, and it is not necessarily the dimension that most affects consumer welfare.

Innovation is a critical dimension of market performance. The impact on consumers from new products and services has far exceeded the impact from price changes in numerous markets.¹⁴ What has been more important for consumer welfare: the development of the modern smartphone or the fact that the smartphone has a retail price of \$400 rather than \$450? New production methods have delivered enormous benefits in many industries. Modern microprocessors

11 15 U.S.C. § 18 (2012).

12 *See, e.g.*, *United States v. H&R Block, Inc.*, 833 F. Supp. 2d 36, 81 (D.D.C. 2011).

13 *See id.*; Michael L. Katz & Howard A. Shelanski, *Mergers and Innovation*, 74 *ANTI-TRUST L.J.* 1, 6–7 (2007).

14 *See* Katz & Shelanski, *supra* note 13, at 3 (“[C]ommentary has criticized enforcement policy toward mergers and acquisitions for attempting to preserve short-run price competition even when doing so has adverse effects on technological progress and even where innovation is likely to ameliorate a merger’s short-run harms to competition.”).

deliver over four million times the performance of Intel's 4004 microprocessor due to innovations in manufacturing and design.¹⁵ Between 1974 and 1996, the price of memory chips decreased by a factor of 27,270 times, a rate of decline of 40.9% per year.¹⁶ Innovations in methods to improve distribution services have led to lower prices and enhanced consumer choice.¹⁷

Innovation has many determinants and ultimately relies on imagination and entrepreneurial spirit to translate ideas into market realities. Although the garage tinkerer and the absent-minded professor are still vital components in the production of innovation, market incentives guide their efforts and the efforts of the large-scale establishments that invest in R&D. Competition is certainly not the sole driver of innovation, but it is an important determinant of the incentive to innovate. The reward of successful innovation and, therefore, the financial incentive to innovate is the difference in the profits that can be earned with and without the invention. Competition affects both parts of this equation. Furthermore, innovation also drives observed market structures, as highly concentrated industries may reflect R&D outcomes that have advantaged one or a few firms.¹⁸

Innovation-based effects can inform merger analysis in various ways. Given that these effects are most often only alleged and not fully litigated,¹⁹ questions regarding both the actual as well as appropriate, antitrust treatment only increase. A merger can positively or negatively affect the incentive and the ability to innovate. Depending upon the significance in absolute terms of those innovation-based effects (dynamic efficiency), as well as their significance relative to other non-innovation-based competitive effects (static efficiency), innovation considerations play either a more central or more secondary role in the antitrust analysis.

Joseph A. Schumpeter and Kenneth J. Arrow each provided seminal, albeit very different, perspectives on the relationship between in-

15 Andrew Danowitz et al., *CPU DB: Recording Microprocessor History*, 10 *ACM QUEUE*, Apr. 2012, at 1, <http://queue.acm.org/detail.cfm?id=2181798>.

16 Dale W. Jorgenson, *Information Technology and the U.S. Economy*, 91 *AM. ECON. REV.* 1, 3 (2001).

17 See Katz & Shelanski, *supra* note 13, at 2 ([W]hen firms invest in research and development . . . they can create valuable new products and reduce the costs of producing existing products.”).

18 See *id.* at 21–22.

19 See Steven C. Salop, *Merger Settlement and Enforcement Policy for Optimal Deterrence and Maximum Welfare*, 81 *FORDHAM L. REV.* 2647, 2647 (2013) (“Merger enforcement today relies on settlements more than litigation to resolve anticompetitive concerns.”).

novation, market power, and competition. Schumpeter is credited as among the earliest and the most influential advocates of the view that size and market power can promote innovation.²⁰ For Schumpeter, who observed the role of technical progress in promoting economic growth in the early twentieth century, what mattered most is not price “but the competition from the new commodity, the new technology, the new source of supply.”²¹ He argued that sacrificing the short-term benefits of pricing close to incremental costs that competitive markets achieve in exchange for greater dynamic performance of less competitive markets can be an attractive trade for consumers and society.²² Schumpeter’s market characterization supports innovation as an efficiency defense for mergers that might otherwise increase or enhance market power, or that might facilitate its exercise.

Roughly three decades after Schumpeter’s treatises, Kenneth Arrow showed that market power could lower incentives to innovate in certain circumstances.²³ Consider two potential inventors striving to develop a new product and assume that each will benefit the same amount if she is successful. Further assume that one of the potential inventors owns a firm with an existing product that generates profits that the innovation would eliminate, while the other potential inventor has no corresponding profits at risk. Arrow showed that the profit flow lowers the incremental benefit from an innovation relative to an inventor that has no such profits at risk from the new product.²⁴ Moreover, to the extent that a reduction in competition would increase this profit flow, it would further decrease the incentive to invent.

Arrow’s conclusion that profits can dampen incentives for innovations that would displace those profits depends on many factors. One factor is the implicit assumption that a new competitor can appropriate the benefits from innovation to no less an extent than an existing firm. This circumstance would obtain if the inventor has strong protection from imitation, for example from an effective patent, and can either fully exploit the innovation in-house or license the

²⁰ See, e.g., Jonathan B. Baker, *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575, 578 (2007).

²¹ JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* 84 (3d ed. 1950).

²² See *id.*

²³ 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, 619–20 (Nat’l Bureau of Econ. Research ed., 1962).

²⁴ *Id.* Jean Tirole has dubbed this the “replacement effect.” JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 395–96 (1988).

technology to others. Without such protection, an established firm that accounts for a large fraction of sales in an industry may gain more from innovation because it can more easily appropriate the benefits.²⁵ Existing profit flows also can have differential effects for investments in processes and products. The incentive to invest in processes that lower a firm's production cost is proportional to the firm's anticipated sales with the new process.²⁶ Projected sales can be larger for an established firm than for a new competitor that has to build a market presence.²⁷ New products can have different benefits for established and new firms depending, inter alia, on the established firm's other products and the scope for product differentiation.²⁸ Furthermore, a firm with market power can have incentives to invest in innovation to preempt investment by competitors in order to maintain its market power.²⁹

A firm's ability to appropriate the benefits of its R&D efforts is central to Schumpeter's and Arrow's contrasting conclusions.³⁰ Appropriation is limited if firms can observe and easily imitate rivals' innovations without compensating them. A merger can increase the combined firm's ability to appropriate the benefits from innovation in two ways. First, if the benefit from an innovation is proportional to the scale of operations that employ the innovation, a merger can increase appropriation by increasing the size of the operations that profit from the innovation.³¹ Second, by increasing the merged firm's market share, a merger can increase appropriation by reducing the share of the market that may imitate the innovation without compen-

²⁵ See, e.g., Arrow, *supra* note 23, at 622 (noting that "appropriability may be greater under monopoly than under competition"); Jonathan B. Baker, *Fringe Firms and Incentives to Innovate*, 63 ANTITRUST L.J. 621, 622 (1995); Michael L. Katz & Howard A. Shelanski, *Merger Policy and Innovation: Must Enforcement Change to Account for Technological Change?*, 5 INNOVATION POL'Y & ECON. 109, 131 (2005).

²⁶ See Richard J. Gilbert, *Looking for Mr. Schumpeter: Where Are We in the Competition-Innovation Debate?*, 6 INNOVATION POL'Y & ECON. 159, 161–62 (2006).

²⁷ See *id.*

²⁸ See *id.*; Yongmin Chen & Marius Schwartz, *Product Innovation Incentives: Monopoly vs. Competition*, 22 J. ECON. & MGMT. STRATEGY 513, 513–14 (2013).

²⁹ See Baker, *supra* note 25, at 634–35; Richard J. Gilbert & David M.G. Newbery, *Preemptive Patenting and the Persistence of Monopoly*, 72 AM. ECON. REV. 514, 514 (1982); Katz & Shelanski, *supra* note 25, at 131.

³⁰ See generally Baker, *supra* note 20; Gilbert, *supra* note 26; Katz & Shelanski, *supra* note 25; Katz & Shelanski, *supra* note 13; Carl Shapiro, *Competition and Innovation: Did Arrow Hit the Bull's Eye?*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY REVISITED* 361 (Josh Lerner & Scott Stern eds., 2012); J. Gregory Sidak & David J. Teece, *Dynamic Competition in Antitrust Law*, 5 J. COMPETITION L. & ECON. 581 (2009).

³¹ See *supra* note 26 and accompanying text.

sating the innovator. The first effect concerns a firm's ability to internalize the innovation's benefits within its own operations. The second effect concerns a firm's ability to reduce technological spillovers that would benefit its rivals and lower the profitability of innovation by rendering the post-innovation market more competitive.

Weak appropriation supports the Schumpeterian view that size, and, indirectly, market share, promotes incentives to innovate. In contrast, if firms can appropriate the benefits from their innovations, Arrow's conclusion applies, as profits from existing operations reduce the net returns to innovation and the incentive to invest in R&D.³² Appropriation is strong when innovations are protected by enforceable intellectual property rights. Alternatively, a firm may be able to appropriate most of the benefits from an innovation if it is a major discovery that allows the firm to capture most of the sales in the industry and the firm can maintain secrecy to avoid imitation. The conditions that affect a firm's ability to appropriate the benefits from its investments in R&D differ among industries and technologies and support different predictions regarding a merger's likely effects on incentives to innovate.

II. ANTITRUST AGENCIES' POLICY STATEMENTS REGARDING INNOVATION

Although the Antitrust Agencies first promulgated merger guidelines during the mid-1960s,³³ innovation would not be explicitly referenced within the guidelines until their revision in 1992, and even then only in a footnote.³⁴ Innovation would not receive meaningful treatment within the merger guidelines until 2010.³⁵ To fully appreciate the

³² See *supra* notes 23–24 and accompanying text.

³³ See *infra* Part II.A. See generally Hillary Greene, *Guideline Institutionalization: The Role of Merger Guidelines in Antitrust Discourse*, 48 WM. & MARY L. REV. 771 (2006) (discussing the manner in which the merger guidelines have exerted increasing influence on judicial rulings through a process of institutionalization).

³⁴ See *infra* Part II.C; *supra* note 49 and accompanying text.

³⁵ See *infra* Part II.D. Innovation has played part of a larger policy framework at the FTC. On the FTC, see generally J. Howard Beales III & Timothy J. Muris, *FTC Consumer Protection at 100: 1970s Redux or Protecting Markets to Protect Consumers?*, 83 GEO. WASH. L. REV. 2157 (2015); Daniel A. Crane, *Debunking Humphrey's Executor*, 83 GEO. WASH. L. REV. 1835 (2015); Jeffrey A. Eisenach & Ilene Knable Gotts, *Looking Ahead: The FTC's Role in Information Technology Markets*, 83 GEO. WASH. L. REV. 1876 (2015); Andrew I. Gavil, *The FTC's Study and Advocacy Authority in Its Second Century: A Look Ahead*, 83 GEO. WASH. L. REV. 1902 (2015); Woodrow Hartzog & Daniel J. Solove, *The Scope and Potential of FTC Data Protection*, 83 GEO. WASH. L. REV. 2230 (2015); David A. Hyman & William E. Kovacic, *Can't Anyone Here Play This Game? Judging the FTC's Critics*, 83 GEO. WASH. L. REV. 1948 (2015); Jeffrey S. Lubbers, *It's Time to Remove the "Mossified" Procedures for FTC Rulemaking*, 83

evolution of the Antitrust Agencies' treatment of innovation, it is also necessary to understand their earlier merger guidelines, which did not address innovation. Part II selectively traces the changes that occurred in the Agencies' merger guidelines from 1968 through 2010.

A. Guidelines in the 1960s

The DOJ issued its first general statement of merger enforcement policy in 1968³⁶ in connection with its role in enforcing Clayton Act, section 7, “to preserve and promote market structures conducive to competition.”³⁷ The 1968 Guidelines adopted the principle that DOJ “seeks primarily to prevent mergers which change market structure in a direction likely to create a power to behave noncompetitively in the production and sale of any particular product.”³⁸ The Guidelines further explained that “a concentrated market structure . . . tends to discourage vigorous price competition” and, conversely, tends to “encourage” other “undesirable” conduct, including inefficient production methods.³⁹ The Guidelines do not identify conduct associated with innovation despite its economic significance. The only reference to technological change occurs within the context of market definition.⁴⁰ As such, the 1968 Guidelines do not focus on whether a change in market structure affects innovation; rather, they only address whether innovation might change the relevant market structure for analysis of the transaction.⁴¹

GEO. WASH. L. REV. 1979 (2015); Maureen K. Ohlhausen, *Weigh the Label, Not the Tractor: What Goes on the Scale in an FTC Unfairness Cost-Benefit Analysis?*, 83 GEO. WASH. L. REV. 1999 (2015); Richard J. Pierce, Jr., *The Rocky Relationship Between the Federal Trade Commission and Administrative Law*, 83 GEO. WASH. L. REV. 2026 (2015); Edith Ramirez, *A Framework for Promoting Competition and Protecting Consumers*, 83 GEO. WASH. L. REV. 2049 (2015); D. Daniel Sokol, *Analyzing Robinson-Patman*, 83 GEO. WASH. L. REV. 2064 (2015); David C. Vladeck, *Charting the Course: The Federal Trade Commission's Second Hundred Years*, 83 GEO. WASH. L. REV. 2101 (2015); Joshua D. Wright & John Yun, *Stop Chug-a-lug-a-lugin 5 Miles an Hour on Your International Harvester: How Modern Economics Brings the FTC's Unfairness Analysis Up to Speed with Digital Platforms*, 83 GEO. WASH. L. REV. 2130 (2015).

³⁶ Merger Guidelines 1968, reprinted in 4 TRADE REG. REP. ¶ 13,101 (2004), www.justice.gov/atr/hmerger/11247.htm.

³⁷ *Id.* § 2.

³⁸ *Id.* § 3(i).

³⁹ *Id.* § 2.

⁴⁰ *Id.*

⁴¹ *See id.* The Guidelines state that in “exceptional circumstances” structural factors will not necessarily be conclusive. An example of such a case might be “where basic technological changes are creating new industries, or are significantly transforming older industries, in such fashion as to make current market boundaries and market structure of uncertain significance.” *Id.*

B. Guidelines in the 1980s

The DOJ's 1982 revision of the horizontal merger guidelines continued the 1968 Guidelines' emphasis on market structure and established as its lodestar "that mergers should not be permitted to create or enhance 'market power' or to facilitate its exercise."⁴² Market power was defined as the "ability of one or more firms profitably to maintain prices above competitive levels for a significant period of time."⁴³ While the 1982 Guidelines nominally recognized that "[s]ellers with market power also may eliminate rivalry on variables other than price,"⁴⁴ such non-price competition received little further elaboration.⁴⁵ Discussion of the potential significance of technological change is very narrowly circumscribed. The Guidelines simply note that rapid technological change may complicate the use of a single price to analyze markets and effects on competition.⁴⁶

The 1982 Guidelines were revised just two years later. Most significantly for efforts to understand innovation as an element of merger policy, the 1984 Guidelines expanded the possible role for efficiencies as a defense—i.e., a mitigating factor—when assessing a merger's anticompetitive effect.⁴⁷ As such, the 1984 Guidelines offered a narrow avenue through which increased innovation could be argued as a procompetitive effect weighing in favor of a proposed merger transaction.

C. Guidelines in the 1990s

The first reference to innovation in Agency merger guidelines occurred in their 1992 revision.⁴⁸ This development, albeit modest, came nearly eighty years after the Clayton Act was enacted. It took the form of a footnote that stated: "Sellers with market power also may lessen competition on dimensions other than price, such as product quality, service, or innovation."⁴⁹ In other respects the 1992 Guidelines continued to emphasize a transaction's ability to create or en-

⁴² Merger Guidelines 1982, *reprinted in* 4 TRADE REG. REP., *supra* note 36, at ¶ 13,102, § I, <http://www.justice.gov/archives/atr/1982-merger-guidelines>.

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *See id.*

⁴⁶ *See id.* § III(C)(1)(a) n.36.

⁴⁷ *See* Merger Guidelines 1984, *reprinted in* 4 TRADE REG. REP., *supra* note 36, at ¶ 13,103, § 3.4, <http://www.justice.gov/archives/atr/1984-merger-guidelines>.

⁴⁸ Merger Guidelines 1992, *reprinted in* 4 TRADE REG. REP., *supra* note 36, at ¶ 13,104, § 4, <http://www.justice.gov/atr/horizontal-merger-guidelines-0>.

⁴⁹ *Id.* § 0.1 n.6.

hance market power (defined by the ability to raise price) or to facilitate its exercise as the key determinant in merger evaluations.⁵⁰ In 1997 the Agencies issued revised guidelines that expanded their treatment of efficiencies.⁵¹ For the first time, the Guidelines explicitly acknowledged that a merger could benefit consumers by enhancing the merged firm's incentive to develop new or improved products, i.e., to be a better innovator.⁵² However, the Guidelines added the qualifications that "certain types of efficiencies are more likely to be cognizable and substantial than others" and that efficiencies related to R&D "are potentially substantial but are generally less susceptible to verification and may be the result of anticompetitive output reductions."⁵³

Sophisticated thinking about innovation and merger effects emerged within the Agencies during the early-to-mid-1990s. By way of example, in a 1993 article, *Innovation Issues Under the 1992 Merger Guidelines*, then-FTC Commissioner Dennis A. Yao and Attorney Advisor Susan S. DeSanti clearly delineated "the need" and "the difficulties" associated with assessing innovation within the merger context.⁵⁴ They then elaborated upon innovation's specific "implications for competitive effects analysis."⁵⁵ The Agencies themselves adopted more comprehensive policies regarding innovation just a few years later, albeit in a nonmerger context, in their jointly issued 1995 *Anti-trust Guidelines for the Licensing of Intellectual Property* ("IP Guidelines").⁵⁶

These developments notwithstanding, the merger guidelines issued in 1992 and 1997 did little more than acknowledge the potential of a merger to harm or benefit innovation.⁵⁷ The cursory treatment of innovation concerns was broadly consistent with Agency decisions at the time. Richard J. Gilbert and Willard K. Tom analyzed the DOJ and FTC merger challenges throughout the 1990s.⁵⁸ From 1990

⁵⁰ See *id.* § 0.1.

⁵¹ Merger Guidelines 1997, reprinted in 4 TRADE REG. REP., *supra* note 36, at ¶ 13,104, <http://www.justice.gov/archives/atr/1997-merger-guidelines>.

⁵² *Id.* § 4.

⁵³ *Id.*

⁵⁴ See Dennis A. Yao & Susan S. DeSanti, *Innovation Issues Under the 1992 Merger Guidelines*, 61 ANTITRUST L.J. 505, 506–09 (1993).

⁵⁵ *Id.* at 513.

⁵⁶ Intellectual Property Guidelines 1995, reprinted in 4 TRADE REG. REP., *supra* note 36, at ¶ 13,132, <http://www.justice.gov/atr/antitrust-guidelines-licensing-intellectual-property>.

⁵⁷ See *supra* notes 49, 52 and accompanying text.

⁵⁸ See Richard J. Gilbert & Willard K. Tom, *Is Innovation King at the Antitrust Agencies? The Intellectual Property Guidelines Five Years Later*, 69 ANTITRUST L.J. 43 (2001).

through 1994, the Agencies cited innovation-based concerns “in only four cases” when challenging a merger, a figure that amounts to only 3% of the cases.⁵⁹ In contrast, over the course of the next five years, innovation concerns characterized 17.5% of the Agencies’ merger challenges,⁶⁰ but Gilbert and Tom found that “innovation concerns were decisive in only a few cases.”⁶¹ They, however, hastened to add that even in those cases in which innovation was raised but not dispositive, one could not conclude that “innovation impacts were unimportant.”⁶²

D. Guidelines in 2010

Another dozen years passed before the next revision of the Guidelines. The 2010 Guidelines both explicitly and prominently address innovation for the first time.⁶³ They mention innovation no fewer than nineteen times, both in the context of potential anticompetitive harms (potential decrease in innovation) and as a potential procompetitive effect in the form of an efficiency defense (potential increase in innovation).⁶⁴ These latest guidelines also acknowledge that adverse effects on innovation may occur with or without simultaneous adverse price effects.⁶⁵

Of particular interest in the 2010 Guidelines is the section titled “Innovation and Product Variety,” which contains two significant assertions.⁶⁶ The first is that “[c]ompetition often spurs firms to innovate.”⁶⁷ The second is that a merger may harm innovation “by encouraging the merged firm to curtail its innovative efforts below the level that would prevail in the absence of the merger.”⁶⁸ The former quotation reflects the presumption that competition and innovation are often intertwined. The latter quotation recognizes the relationship between a change in market structure accompanying a merger and the merged firm’s incentive to innovate. The Guidelines explain that diminished innovation could entail “reduced incentive to continue with an existing product-development effort or reduced incentive to initi-

⁵⁹ *Id.* at 49.

⁶⁰ *Id.*

⁶¹ *Id.* at 44.

⁶² *Id.*

⁶³ Merger Guidelines 2010, reprinted in 10 TRADE REG. REP. (CCH) ¶ 13,100, <http://www.justice.gov/atr/public/guidelines/hmg-2010.pdf> [hereinafter Merger Guidelines 2010].

⁶⁴ *See id.* §§ 1, 6, 6.4, 10.

⁶⁵ *Id.* § 6.4.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

ate development of new products.”⁶⁹ More specifically, they attribute the diminished incentive to initiate new product development to a “longer-run effect” that is “most likely to occur if at least one of the merging firms has capabilities that are likely to lead it to develop new products in the future that would capture substantial revenues from the other merging firm.”⁷⁰

The 2010 Guidelines observe the importance of appropriation as a determinant of a merger’s effect on innovation:

When evaluating the effects of a merger on innovation, the Agencies consider the ability of the merged firm to conduct research or development more effectively. . . . The Agencies also consider the ability of the merged firm to appropriate a greater fraction of the benefits resulting from its innovations. Licensing and intellectual property conditions may be important to this enquiry, as they affect the ability of a firm to appropriate the benefits of its innovation.⁷¹

Nonetheless, the 2010 Guidelines also note, “[r]esearch 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.”⁷² Importantly, the 2010 Guidelines do not provide additional detail to reconcile their stated reluctance to consider R&D cost savings as cognizable efficiencies with their recognition of the potential R&D benefits from the ability of the merged firm to appropriate a greater fraction of the gains from its innovations.

In order to better understand how the Agencies have dealt with innovation concerns, Part III presents empirical evidence regarding the frequency of innovation challenges by the Agencies and the characteristics of the industries in which these challenges have occurred.

III. ANTITRUST AGENCIES’ ENFORCEMENT RECORDS REGARDING INNOVATION

As Part II explained, the Guidelines issued by the U.S. Antitrust Agencies describing their merger enforcement methodologies have changed dramatically in their treatment of innovation. The first guidelines failed to acknowledge any role for innovation either as a potential adverse competitive effect or as a possible efficiency de-

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.* § 10.

⁷² *Id.*

fense.⁷³ Over the past two decades, the subsequent guidelines evolved from a brief statement limiting innovation to a subset of non-price competitive effects to providing a prominent place for innovation in the 2010 Merger Guidelines. Part III reviews the recent record of merger enforcement actions by the DOJ and FTC with a focus on the frequency and manner with which they allege innovation harms.

A. *The Frequency of Innovation-Related Challenges*

Although the concept of innovation embraces a wide range of activities that influence the development of new products, services, or cost-reducing methods, this Essay employs a literal definition to identify enforcement actions that involve innovation. A matter is identified as raising innovation-based concerns if it explicitly uses the term “innovation” or “research and development” to describe, within select public documents, the marketplace or the competitive effects. One of the practical consequences associated with this definition is that it excludes mergers covering a swath of industries for which the Agencies describe the competitive effects solely in terms of “product development” or “product design,” an issue addressed below.

We identified the universe of mergers for which the FTC or DOJ filed a complaint during the eleven-year period of 2004 through 2014.⁷⁴ Proposed mergers that the parties abandoned prior to the filing of a complaint were excluded. The small number of proposed mergers that were abandoned after a complaint was filed were included in this analysis. Although the universe includes numerous litigated mergers, most were resolved with consent agreements that were filed concurrently with the complaints.

Application of the foregoing criteria yielded 250 challenged mergers. For each of these matters, we analyzed the FTC or the DOJ’s complaint as well as, whenever available, the FTC’s Analysis to Aid Public Comment or the DOJ’s Competitive Impact Statement. The Agencies file these documents (collectively referred to as “merger documents”) for public comment prior to entering into a con-

⁷³ See *supra* Part II.A–C.

⁷⁴ Data on mergers from 2008 to 2014 was derived, in part, from Market Federal Merger Enforcement Actions Summaries published by Thomson Reuters. The authors collected data for 2004 to 2007 from published complaints and other Agency documents. The DOJ and the FTC websites provide the relevant merger documents. See generally *Antitrust Case Filings*, U.S. DEP’T JUST., www.justice.gov/atr/cases/index.html#page=page-1 (last visited Oct. 27, 2015); *Enforcement: Cases and Proceedings*, FED. TRADE COMM’N, www.ftc.gov/enforcement/cases-proceedings (last visited Oct. 27, 2015).

sent decree.⁷⁵ For each matter we examined whether these documents alleged, in strong or weak terms, that the merger implicated innovation or R&D.

Table 1 provides some summary statistics for the challenged transactions. During this eleven-year period, the DOJ challenged approximately half as many mergers as did the FTC. The DOJ and FTC raised innovation-based considerations within thirty and fifty-four transactions, respectively. Both the DOJ and the FTC alleged harm to innovation in about one-third of their merger challenges.

TABLE 1. MERGER CHALLENGES: 2004–2014

	Number	Percent of Category
Total # of Challenged Transactions	250	100%
FTC Challenges	164	65.6%
DOJ Challenges	86	34.4%
Total # of Challenges Alleging Harm to Innovation	84	33.6%
FTC Challenges Alleging Harm to Innovation	54	32.9%*
DOJ Challenges Alleging Harm to Innovation	30	34.9%**

*Percentage of FTC challenges that allege harm to innovation

**Percentage of DOJ challenges that allege harm to innovation

This study uses statistics from the National Science Foundation (“NSF”)⁷⁶ and the Brookings Institution (“Brookings”)⁷⁷ to classify in-

⁷⁵ For those matters in which the FTC issued an administrative complaint and also filed an injunction or temporary restraining order in federal court, this Essay references the FTC administrative complaint. That stylistic convention does not influence the results. The FTC filed a complaint within the U.S. district court system in addition to filing an administrative complaint within the Agency itself in only 10 of the 164 FTC matters considered. 8 of those matters involved a complaint for a temporary restraining order, and 2 involved a complaint for a preliminary injunction alone. Additionally, the FTC filed a complaint *only* in federal court without filing a corresponding administrative complaint in 3 matters.

Most important for instant purposes, the 3 district court complaints that raise innovation considerations do so in a manner that is identical to their corresponding administrative complaints. The 3 matters are: *FTC v. Ardagh Grp. S.A.*, No. 1:13-cv-01021-RMC (D.D.C. 2013); *FTC v. Graco Inc.*, No. 1:11-cv-02239-RLW (D.D.C. 2011–2012); and *FTC v. OSF Healthcare Sys.*, No. 3:11-cv-50344 (N.D. Ill. 2011–2012). Moreover, none of the district court complaints omit innovation issues that were raised in the corresponding administrative complaint and none of the complaints lodged solely within the district courts raised innovation considerations. See generally 15 U.S.C. § 53(b) (2012) (delineating circumstances under which the FTC can pursue a temporary restraining orders, or preliminary injunction, prior to filing an administrative complaint).

⁷⁶ NAT’L SCI. FOUND., DIV. OF SCI. RES. STATISTICS, SURVEY OF INDUSTRIAL RESEARCH

dustry sectors into three levels of R&D intensity, here labeled low, moderate, and high. The Appendix lists the industry sectors in each category.⁷⁸ NSF and Brookings employ different metrics for different time periods. The NSF data are R&D expenditures as a fraction of sales for 2003–2007, and the Brookings data are R&D expenditures per worker for 2009. The two data sets sometimes yield different R&D intensity rankings for the same industry, and in other cases the industry classifications encompass broad economic sectors that include subsectors with different R&D intensities. Subjective assignments were necessary for a few sectors for which the data sources were not consistent or industry sectors were not reported at a sufficient level of detail.⁷⁹

Our search algorithm does not always clearly identify innovation concerns in merger challenges because the Agencies do not always use the terms “innovation” or “research and development” to describe their concerns about mergers that might affect the supply of new or improved products or services. In some cases the Agencies refer to harm to product “development” or “design” without specifically mentioning innovation or R&D. The search algorithm excludes these other terms out of concern about casting an overbroad net that might ensnare merger challenges that do not involve innovation or R&D.⁸⁰ It, nonetheless, is instructive to examine certain isolated examples in order to consider how they might affect the conclusions of this study, which we do below.

In addition to industry R&D intensity, this analysis used other data from the relevant merger documents regarding the parties and the industries that the proposed transaction affected. These data in-

AND DEVELOPMENT: SCIENCE AND ENGINEERING INDICATORS 2010, Appendix Table 4-14, <http://www.nsf.gov/statistics/seind10/append/c4/at04-14.pdf>.

77 MARK MURO ET AL., BROOKINGS ADVANCED INDUS. PROJECT, AMERICA’S ADVANCED INDUSTRIES: WHAT THEY ARE, WHERE THEY ARE, AND WHY THEY MATTER 21 (2015), http://www.brookings.edu/~media/Research/Files/Reports/2015/02/03-advanced-industries/final/AdvancedIndustry_FinalFeb2lores.pdf?la=en.

78 A description of the data and the algorithms for classifying industries is on file with the authors.

79 Industry sectors requiring such subjective assignments include “generic pharmaceuticals,” “oil and gas retailing, transport, and storage,” and “media, broadcasting, and entertainment,” all assigned to low R&D intensity, and “genetically modified organisms,” assigned to high R&D intensity. In a few cases the two sources classify the same industry as having different R&D intensities. In those instances, this Essay uses only the most R&D-intensive classification. *See infra* Appendix.

80 Note that the determination of whether innovation *harm* is alleged is complicated by what constitutes an innovation. For example, minor changes to assembly processes or minor product improvements may or may not be identified as potential innovations.

clude the transaction size, whether unilateral or coordinated competitive effects were alleged, whether the transaction excluded a potential entrant, whether the transaction had a vertical component, and the market concentration or number of significant competitors for each market identified in the complaint or other public document. We conducted a probit regression that related the probability that the Agencies allege harm to innovation in their merger challenges to these industry and market characteristics. With the exception of industry R&D intensity, none of these variables was related to the probability of an innovation allegation with a high degree of statistical confidence. In particular, allegations of innovation harm were not more likely in mergers that were larger, mergers in more concentrated industries, or mergers involving the exclusion of potential entrants.⁸¹

Table 2 shows the percentage of merger challenges that allege harm to innovation for the DOJ and FTC collectively and for each Agency separately, categorized according to the R&D intensity of the affected industry. For the DOJ and FTC combined, merger challenges that invoked innovation considerations occurred almost five times as often in moderately R&D-intensive industries as compared with challenges in industries with low R&D intensity (44.2% versus 9.0%). In industries with high R&D intensity, merger challenges that allege innovation occurred more than nine times as often as compared with challenges in industries with low R&D intensity (82.5% versus 9.0%). As Table 2 highlights, both the DOJ and FTC allege harm to innovation in a very high percentage of merger challenges in industries that this analysis classifies as having high R&D intensity.

TABLE 2. FRACTION OF AGENCY MERGER CHALLENGES THAT ALLEGE HARM TO INNOVATION 2004–2014

	Low R&D Intensity	Moderate R&D Intensity	High R&D Intensity
FTC + DOJ	9.0%	44.2%	82.5%
FTC	6.0%	32.4%	82.6%
DOJ	13.3%	88.9%	82.4%

Both the harm to innovation from a merger and the potential for a change in industry structure to promote innovation—and therefore create a merger-specific efficiency—are most likely to occur in industries with high R&D intensity. In all but three mergers that the DOJ

⁸¹ The regression results are on file with the authors.

challenged in industries identified as high R&D intensity, the search algorithm also revealed that the DOJ alleged that these mergers, if consummated without conditions, would harm innovation. It is instructive to examine more closely these three outliers.⁸²

The DOJ challenged Cengage Learning, Inc.'s proposed acquisition of Houghton Mifflin College Division's assets.⁸³ The product market was the "development, publication, and sale of textbooks and ancillary . . . materials" for use in courses taught at higher education institutions throughout the United States.⁸⁴ This product market corresponds to "publishing," which the NSF classified as having relatively high R&D intensity.⁸⁵ If, instead, textbook publishing were classified as having moderate- or low-R&D-intensity,⁸⁶ the fraction of merger challenges in high-R&D-intensity industries for which the DOJ raised innovation concerns would increase to nearly eighty-eight percent (14/16).

There were two other mergers that the DOJ challenged in highly R&D-intensive industries for which the search algorithm did not identify innovation concerns. These were *United States v. General Electric Co.*⁸⁷ and *United States v. Microsemi Corp.*⁸⁸ In the former, the DOJ raised concerns about "development, manufacture, and sale of [low-speed synchronous electric motors]"⁸⁹ and in the latter the "develop-

⁸² In addition to possible false negatives, our algorithm may also generate possible false positives. A small subset of the high-R&D-intensity matters in which the relevant product market is defined as including "research, development" as well as "manufacture, sale" are coded as innovation, but do not include any explicit reference to "innovation" or harm to "research and development" and, therefore, might not actually involve innovation. See *In re Eli Lilly & Co.*, FTC File No. 141-0142, 2014 WL 7330499, at *1-2 (F.T.C. Dec. 19, 2014) (complaint); *In re Novartis AG*, 150 F.T.C. 281, 283 (2010); *In re Allergan*, 141 F.T.C. 165, 167 (2006). Furthermore, it is also possible that some industries classified as having low or moderate R&D intensity might more properly be considered as having high R&D intensity.

⁸³ Complaint, *United States v. Cengage Learning Holdings*, No. 1:08-cv-00899, 2008 WL 5448236 (D.D.C. Sept. 19, 2008).

⁸⁴ *Id.* at 2.

⁸⁵ NAT'L SCI. FOUND., *supra* note 76.

⁸⁶ Brookings's "software publishers" category has relatively high R&D intensity. Brookings has no separate category for "publishers." See Muro ET AL., *supra* note 77, at 21. It is possible that the NSF category "publishers" includes software and other digital technologies that have relatively high R&D intensity. If the datasets employed more granular categories in the "publishers" field, considering publication of hard-copy textbooks as distinct from digital publishing technologies, they might well identify textbook publishing as low or moderate in R&D intensity.

⁸⁷ Complaint, *United States v. Gen. Elec. Co.*, No. 1:11-cv-01549 (D.D.C. Aug. 29, 2011).

⁸⁸ Verified Complaint, *United States v. Microsemi Corp.*, No. 1:08-cv-1311 (E.D. Va. Dec. 18, 2008).

⁸⁹ Complaint, *supra* note 87, at 10.

ment, manufacture and sale” of transistors and diodes.⁹⁰ Although not highlighted by the search algorithm, these statements suggest concerns about harms related to product innovation.⁹¹

If one reclassified these three cases for the foregoing reasons and the balance of the cases are correctly analyzed with regard to both the presence of an alleged harm to innovation and the designation of R&D intensity, then one would conclude that the DOJ raised innovation concerns in 100% of the mergers that it challenged in high-R&D-intensity industries.

According to this Essay’s classification of industry R&D intensity and search algorithm to identify innovation concerns, the FTC did not raise innovation concerns when challenging eight mergers in high-R&D-intensity industries.⁹² If one reexamined these eight merger challenges to assess whether they raised possible innovation concerns that escaped our algorithm, it would not be unreasonable to conclude that a substantial fraction of these cases involved innovation harms such as harm to “product development,” leading to the conclusion that the FTC raised innovation concerns in approximately ninety percent of the mergers that the Agency challenged in highly R&D-intensive industries.

The differences in the respective fractions of challenged mergers for which the DOJ and FTC alleged harm to innovation, as indicated in Table 2, need not necessarily indicate different enforcement pos-

⁹⁰ Complaint, *supra* note 88, at 2.

⁹¹ These concerns likely address significant technological improvements to the products considered in these matters. Otherwise, innovation harm could be linked to almost any product involving some development, even when the innovation involved is relatively small. See *supra* note 80.

⁹² The eight cases and the corresponding relevant product markets are: (1) Complaint, Honeywell Int’l, Inc., File No. 131-0070 (F.T.C. Sept. 13, 2013) (2D scan engines); (2) Complaint, Gen. Elec. Co., File No. 131-0069 (F.T.C. July 19, 2013) (gear boxes for jet engines); (3) Complaint, King Pharm., Inc. & Alpharma, Inc., File No. 081-0240 (F.T.C. Dec 29, 2008) (oral long-acting opioid analgesics); (4) Complaint, CCC Holdings Inc., File No. 081-0155 (F.T.C. Nov. 25, 2008) (estimates and total loss valuation systems markets); (5) Complaint, TALX Corp., File No. 061-0209 (F.T.C. Aug. 6, 2008) (provision of outsourced employment verification services); (6) Complaint, Hexion LLC & Huntsman Corp., File No. 071-0212 (F.T.C. Oct. 2, 2008) (specialty epoxy resins); (7) Complaint, Cephalon, Inc. & CIMA Labs, Inc., File No. 041-0025 (F.T.C. Sept. 12, 2004) (prescription drug products for the treatment of breakthrough cancer pain); (8) Complaint, Ovation Pharm., Inc., File No. 081-0156 (F.T.C. Dec. 16, 2008) (Indocin and NeoProfen for the treatment of patent ductus arteriosus). Two cases involved drugs that were about to go off patent (*King* and *Cephalon*). In two other cases the FTC alleged harm to product design or development (*General Electric* and *Hexion*). Furthermore, in an additional two cases the product markets arguably could be classified as having moderate R&D intensity (*TALX* and *CCC Holdings*).

tures by the two agencies, as their industry portfolios differ.⁹³ The observation that the FTC alleges harm to innovation in a smaller percentage of mergers than the DOJ in industries classified as moderate in R&D intensity could well reflect that more FTC-reviewed mergers occur in industries that the NSF and Brookings classify as moderately R&D-intensive, but are not viewed as such by the Agency. For example, for historical reasons and based on accumulated experience, a significant fraction of the FTC's merger-enforcement portfolio is in the health care industry.⁹⁴ Both the NSF and Brookings classify "health care services" as having moderate R&D intensity.⁹⁵ Yet this classification, like a number of others, encompasses a very broad swath of activities, many of which are not R&D-intensive. Examples include outpatient surgery services and inpatient services provided by hospitals that do little R&D.

By concentrating markets, mergers can either harm or promote incentives for innovation.⁹⁶ An increase in market power from a merger can dull the incentive to invent in at least two ways. By increasing the flow of profits from existing products and services, the merger can reduce the merged firm's incentive to create new products and services.⁹⁷ Alternatively, the merger can combine two firms, each of which would have taken significant sales from the other if they had been successful innovators.⁹⁸ The merger internalizes this externality, thereby reducing incentives for invention.

Yet a merger also can increase incentives for innovation. Many innovations create value that is largely specific to the firm that develops the innovation. A new process to lower production costs will create value that is proportional to the innovator's sales, unless the innovator can license others at terms that reflect the lower costs enabled by the innovation.⁹⁹ If licensing at compensatory terms is not viable, a larger firm has a greater incentive to innovate because it has more sales that can benefit from the innovation.¹⁰⁰ A merger can enhance this type of innovation by enabling the merged firm to appro-

⁹³ See *How Mergers Are Reviewed*, FED. TRADE COMM'N, <https://www.ftc.gov/news-events/media-resources/mergers-and-competition/merger-review> (last visited Oct. 27, 2015) [hereinafter *How Mergers Are Reviewed*].

⁹⁴ See Mary K. Marks & Beverly J. Ang, *Agency Merger Enforcement in Non-Reportable Transactions*, ANTITRUST SOURCE, Feb. 2010, at 1, 2.

⁹⁵ NAT'L SCI. FOUND., *supra* note 76; MURO ET AL., *supra* note 77, at 21.

⁹⁶ See *supra* Part I.

⁹⁷ See *supra* notes 23–24 and accompanying text.

⁹⁸ See *supra* note 70 and accompanying text.

⁹⁹ See *supra* note 26 and accompanying text.

¹⁰⁰ See *supra* notes 25–27 and accompanying text.

priate a larger share of the innovation's potential value. In a sense, the merger partially solves the appropriation problem associated with imperfect licensing.

Of course, the Agencies challenge only a fraction of the mergers that they investigate.¹⁰¹ We do not observe the mergers that proceed unchallenged because the Agencies recognize their procompetitive benefits regarding innovation. These mergers do not appear in any searchable database. Instead, what we observe are mergers that the Agencies have challenged because they are likely to raise prices or harm innovation, or both. It is possible that the Agencies only challenge a merger in a high-R&D-intensive industry if they conclude the merger is likely to harm innovation. However, because not all mergers that are likely to raise prices also harm innovation, it should be the case that some fraction of the observed challenges fall within industries for which adverse innovation effects are unlikely.

Nonetheless, both the DOJ and the FTC allege adverse innovation effects in a very large fraction of their respective merger challenges in high-R&D-intensity industries.¹⁰² Furthermore, their innovation challenges across all types of industries are statistically unrelated to a set of reported characteristics (market concentration, transaction size, etc.) of those industries other than R&D intensity.¹⁰³ Yet one would expect net merger benefits for innovation to be more likely in some industries than in others, holding R&D intensity constant. Furthermore, there ought to be at least some mergers in which significant harm to innovation is not likely.

The very high fraction of challenged mergers in high-R&D-intensity industries in which the Agencies allege harm to innovation, then, invites further consideration. One explanation is that the Agencies undervalue or inadequately consider innovation benefits that may arise from a merger in such sectors. This explanation is consistent with the lack of evidence from the probit regression analysis that relevant factors such as market concentration, transaction size, and concerns about coordinated anticompetitive effects correlate with allegations of harm to innovation. Another possibility is that when the Agencies predict a net benefit to innovation from a merger, the predicted innovation benefit is highly weighted vis-à-vis any predicted static consumer harm (at least in high-R&D-intensity industries). If, in the exercise of prosecutorial discretion, innovation benefits gener-

101 See *How Mergers Are Reviewed*, *supra* note 93.

102 See *supra* Table 2.

103 See *supra* text accompanying note 81.

ally trump price effects, then the Agencies will not challenge the merger and, therefore, proposed mergers involving a net positive benefit to innovation would not appear in the data regarding merger challenges.¹⁰⁴ However, economic theory suggests that some mergers should not present significant concerns about innovation, even if those mergers occur in high-R&D-intensity industries.¹⁰⁵ These mergers may raise static concerns from higher prices, but should not also raise concerns about dynamic effects. Hence, this is an incomplete explanation. In either case, as discussed in the next section, the Agencies should provide greater clarity regarding their analysis of innovation harms.¹⁰⁶

B. *The Treatment of Innovation-Related Challenges*

The central determination in our analysis is whether and under what conditions the Agencies invoke harm to innovation within their respective merger challenges. This Section provides some further insight regarding the heterogeneity characterizing the Agencies' invocation of innovation-based concerns. This Essay's binary treatment of an innovation challenge does not address, for example, the level of Agency concern. Assessing the level of concern, particularly from the public documents at issue herein, is both a difficult and subjective task. As such, we adopt a relatively simple approach that treats the manner in which innovation is invoked as a noisy measure of the level of concern.

We divided the eighty-four matters for which the Agencies have alleged innovation concerns into two groups depending upon whether the Agency's treatment of innovation, as defined by our search algorithm, takes the form of being *mentioned* or *discussed*. "Mentioned" describes a case in which the Agency directly states that a decrease in competition will harm innovation but the Agency does not provide further elaboration. This would include various circum-

¹⁰⁴ In other antitrust contexts courts have treated innovation benefits quite favorably. See, e.g., Hillary Greene, *Muzzling Antitrust: Information Products, Innovation and Free Speech*, 95 B.U. L. REV. 35, 79 (2015) (stating that as a practical matter in Sherman Act section 2 monopolization cases involving allegedly anticompetitive product redesign, "the existence of a non-pretexual innovation justification is sufficient to overcome claimed anticompetitive effects").

¹⁰⁵ As previously discussed, mergers in industries with weak appropriation should not raise significant innovation concerns. See *supra* notes 20–32, 99–100 and accompanying text. Furthermore, innovation concerns should be less likely when the alleged competitive effects take the form of coordinated interactions because it is more difficult for firms to coordinate on research and development expenditures.

¹⁰⁶ When Agencies challenge mergers, it appears that, as a matter of litigation strategy, their complaints do not address procompetitive benefits other than to cursorily reject them.

stances such as when an Agency notes that an acquisition will eliminate competition and “likely will result in higher prices and reduced innovation”¹⁰⁷ or when the Agency states that “eliminating . . . competition . . . [for] research, development, manufacture, and sale . . . [would] reduc[e] existing incentives to improve product quality or to pursue further innovation.”¹⁰⁸

“Discussed” describes instances when the Agency not only explicitly posits harm to innovation but also elaborates upon the contours or nature of that harm.¹⁰⁹ Such discussion frequently entails a more specific statement that the market at issue has benefited from innovation spurred by competition.¹¹⁰ And a portion of those discussions often specifically identifies the innovations that resulted from such competition and the likely harms that would occur from the proposed transaction.¹¹¹

Though less common, the nature of innovation is reflected in discussions regarding the mechanisms of innovation or distinctions among firms’ innovation capabilities. For example, one complaint contained a subsection entitled, “How Competition Occurs,” which explained that producers “must engage in research and development to deliver better . . . products in order to compete effectively.”¹¹² Another complaint discussed how harm to innovation would arise, in part, because “[i]t would be prohibitively expensive for many customers to develop a [product] with functionality comparable to the features offered by [the merging parties], and it would be difficult to maintain the same pace of innovation.”¹¹³

Figure 1 presents the summary statistics. The Agencies merely mention innovation in roughly half of the challenges that raise innova-

¹⁰⁷ *In re Solera Holdings, Inc.*, FTC File No. 121-0165, 2013 WL 3830389, at *39 (F.T.C. June 22, 2013) (analysis of proposed agreement).

¹⁰⁸ Complaint, *supra* note 87, at 4.

¹⁰⁹ The “discussed” category also includes “innovation market” arguments that address the development of markets that do not yet exist. See *In re Nielsen Holdings N.V.*, File No. 131-0058, 2014 WL 869523, at *2–3 (F.T.C. Feb. 24, 2014) (complaint); Intellectual Property Guidelines 1995, *supra* note 56, § 3.2.3.

¹¹⁰ See, e.g., *In re Hologic, Inc.*, File No. 051-0263, 2006 WL 2522714, at *3–4 (F.T.C. Aug. 9, 2006).

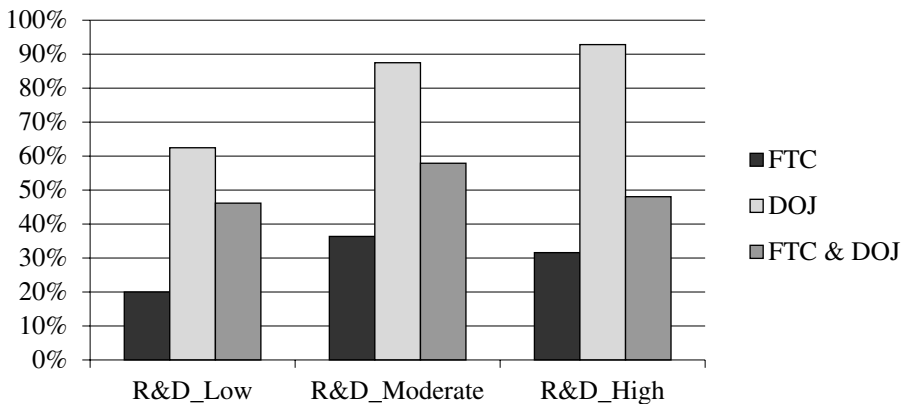
¹¹¹ See, e.g., Complaint at 3, *United States v. AT&T Inc.*, No. 1:11-cv-01560 (D.D.C. Aug. 31, 2011) (“[U]nless this acquisition is enjoined, customers of mobile wireless telecommunications services likely will face higher prices, less product variety and innovation, and poorer quality services due to reduced incentives to invest than would exist absent the merger.”).

¹¹² Complaint at 9, *United States v. Amcor Ltd.*, No. 1:10-cv-00973 (D.D.C. June 10, 2010).

¹¹³ Complaint at 12, *United States v. Bazaarvoice, Inc.*, No. 13-cv-00133 (N.D. Cal. Jan. 10, 2013).

tion concerns, and they discuss innovation effects in the remaining matters (i.e., 46%, 58%, and 48% for low-, moderate-, and high-R&D-intensity industries, respectively). These discussion rates do not vary markedly across the three R&D intensity categories. As such, the use of the binary indicator for an innovation challenge in this Essay's earlier analysis does not appear to mask a skewed pattern of discussion about innovation effects that differs across R&D-level categories.

FIGURE 1. PERCENT OF INNOVATION MATTERS THAT ARE "DISCUSSED"



We also analyzed the data underlying Figure 1 to examine whether the use of “research, development” within our search algorithm skewed the results regarding high-R&D-intensity industries because “research, development” could be present in the merger documents at issue regardless of the existence of an innovation concern.

One interesting pattern that emerged is an apparent difference in relative treatment by the Agencies. Conditional on an innovation concern being raised within the documents at issue, on average DOJ engages in a greater level of discussion than does the FTC. This difference is found across every level of R&D intensity. The Agencies review different portfolios of industries and, therefore, this apparent difference could be explained in part by a composition effect as was discussed regarding the percentage of merger challenges involving innovation in Table 2.¹¹⁴ However, because DOJ has higher levels of discussion across all R&D intensity categories, composition effects are unlikely to fully explain this pattern. Instead, this pattern might suggest that DOJ substantively handles innovation somewhat differently

¹¹⁴ See *supra* note 93 and accompanying text.

than FTC. Alternatively, the difference could be explained by the arguably higher standard of review DOJ receives compared with the FTC regarding consent orders and complaints.¹¹⁵ Or, it could merely reflect a difference in more formalistic conventions rather than a substantive difference in how these matters are analyzed. Any more definitive assessment of these data is beyond this scope of this Essay.

CONCLUDING THOUGHTS REGARDING FURTHER GUIDANCE

Innovation is a critical issue for merger policy. Mergers can promote as well as harm innovation. Complaints and other public statements issued by the Antitrust Agencies generally focus on the likely anticompetitive effects from a combination and rarely explain the reasons why they choose not to challenge a transaction, including possible efficiency defenses from innovation. However, it is this Essay's view that the Agencies can provide greater transparency to antitrust practitioners and the business community, and possibly sharpen their analytical approach, if the Agencies describe their innovation concerns with greater specificity when merger challenges allege harm to innovation.

The 2010 Guidelines constitute a valuable contribution to the merger discourse regarding innovation but offer few details to describe the Antitrust Agencies' analytical processes in evaluating innovation concerns. This Essay's attempt to reverse engineer their approach by examining actual enforcement actions in merger cases reveals few consistent patterns. It is unavoidable that at any given point the merger guidelines' content will invariably lag somewhat behind both the academic and practical insights drawn from the legal, economics, and business fields, as well as actual Agency practices. Scholarly research that posits a connection between competition and incentives to innovate is complex and evolving. The empirical evidence is impressive but not entirely definitive. Nevertheless, there are important themes that have withstood the test of time without contradiction from theory or empirics. Central among them is the importance of appropriation for incentivizing R&D.

The Guidelines note the significance of appropriation to the analysis of a merger's effects on the incentive to innovate, but more detail about how each Agency undertakes such an evaluation is needed. Providing such detail would better inform businesses and antitrust

¹¹⁵ See Todd N. Hutchison, *Understanding the Differences Between the DOJ and the FTC*, AM. BAR ASS'N: 101 PRAC. SERIES, http://www.americanbar.org/groups/young_lawyers/publications/the_101_201_practice_series/understanding_differences.html (last visited Oct. 27, 2015).

practitioners about the Agencies' enforcement practices and clarify the Agencies' concerns about potential harms to innovation from mergers and the scope for innovation-related merger efficiencies.

APPENDIX: INDUSTRY SECTOR R&D INTENSITY¹¹⁶A. *High R&D Intensity*

Aerospace products and parts
Architectural, engineering, and related services
Audio and video equipment
Chemicals
Communications equipment
Computer and electronic products
Computer systems design and related services
Data processing, hosting, and related services
Engines, turbines, and power transmission equipment
Genetically modified organisms**
Internet service providers and Web search portals
Medical equipment and supplies
Motor vehicles
Navigation, measurement, and control instruments
Other transportation equipment
(Patented) pharmaceuticals and medicines
Pesticides, fertilizers, and other agricultural chemicals
Professional, scientific, and technical services
Publishing
Semiconductors and other electronic components
Software publishers

B. *Moderate R&D Intensity*

Aluminum production and processing
Basic chemicals
Clay products
Construction
Electrical equipment, appliances, and components
Health care services
Machinery
Magnetic and optical media
Management of companies and enterprises
Mining, extraction, and support activities
Miscellaneous manufacturing
Motor vehicle parts
Newspaper, periodical, book, and database

¹¹⁶ See MURO ET AL., *supra* note 77; NAT'L SCI. FOUND., *supra* note 77; *see also* text accompanying notes 76–78.

OTC drugs (low patent protection)**
Other chemicals
Other nonmanufacturing (family services)
Plastics and rubber products
Resin, synthetic rubber, fibers, and filament
Satellite telecommunications
Ship and boat building
Transportation equipment

C. *Low R&D Intensity*

Beverage and tobacco products
Cable and other subscription programming
Concrete, sand and gravel**
Consumer nondurables**
Electric lighting equipment*
Electric power generation, transmission, and distribution
Electrical equipment*
Fabricated metal products
Finance, insurance, and real estate***
Food
Foundries and fabricated metal products
Furniture and related products
Generic pharmaceuticals**
Household appliances*
Iron, steel, and ferroalloys
Media, broadcasting and entertainment**
Medical and diagnostic laboratories
Metal ore mining (and primary metals)
Managerial, scientific, and technical consulting
Miscellaneous services**
Motor vehicle bodies and trailers
Oil and gas extraction*
Oil and gas retailing, transport and storage**
Other nonmetallic mineral products
Outpatient medical services**
Paper, printing, and support activities
Petroleum and coal products*
Railroad rolling stock
Retail trade
Textiles, apparel, and leather
Transportation and warehousing

Utilities

Wired and wireless (except satellite) telecommunications carriers

Wood products

* Imputed from 3-digit NAICS by Brookings

** Category added to list without data

*** Category added despite data at 2-digit NAICS level