

University of Pennsylvania Carey Law School

Penn Law: Legal Scholarship Repository

Faculty Scholarship at Penn Law

2011

Markets in IP and Antitrust

Herbert J. Hovenkamp

University of Pennsylvania Carey Law School

Follow this and additional works at: https://scholarship.law.upenn.edu/faculty_scholarship



Part of the [Antitrust and Trade Regulation Commons](#), [Economic Policy Commons](#), [Industrial Organization Commons](#), [Intellectual Property Law Commons](#), [Law and Economics Commons](#), [Policy Design, Analysis, and Evaluation Commons](#), [Science and Technology Policy Commons](#), and the [Technology and Innovation Commons](#)

Repository Citation

Hovenkamp, Herbert J., "Markets in IP and Antitrust" (2011). *Faculty Scholarship at Penn Law*. 1905.
https://scholarship.law.upenn.edu/faculty_scholarship/1905

This Article is brought to you for free and open access by Penn Law: Legal Scholarship Repository. It has been accepted for inclusion in Faculty Scholarship at Penn Law by an authorized administrator of Penn Law: Legal Scholarship Repository. For more information, please contact PennlawIR@law.upenn.edu.

Response: Markets in IP and Antitrust

HERBERT HOVENKAMP*

TABLE OF CONTENTS

INTRODUCTION	2133
I. HOW MARKETS ARE RELEVANT	2137
A. MARKETS VS. BRANDS	2137
B. PRODUCT BOUNDARIES VS. MARKET BOUNDARIES	2139
C. MEASURING POWER WITHOUT MARKET DEFINITION: FIXED COSTS	2140
II. QUESTIONS OF IP SCOPE AND REMEDIES: MARKET DELINEATION BUT RARELY MARKET POWER	2141
A. IP AND ANTITRUST INQUIRIES: IMPORTANT SIMILARITIES AND DIFFERENCES	2141
B. MARKET DELINEATION IN CASES INVOLVING DESIGN, EXPRESSION, AND FUNCTION	2144
C. IP RIGHTS AND PRODUCT DIFFERENTIATION	2145
D. COMPETITION POLICY, MARKET DELINEATION, AND IP SCOPE	2148
III. POST-ACQUISITION IP PRACTICES THREATENING COMPETITION OR INNOVATION	2152
A. POWER AND CONDUCT	2153
B. PRICE DISCRIMINATION	2153
C. POSTSALE RESTRAINTS AND EXHAUSTION	2154
D. POOLS, STANDARD SETTING, AND OTHER COLLABORATIVE LICENSING	2156
CONCLUSION	2157

INTRODUCTION

The purpose of market definition in antitrust law is to identify a grouping of sales such that a single firm who controlled them could maintain prices for a significant time at above the competitive level. The goal is not to delineate market boundaries for their own sake, but rather to identify situations in which

* Ben V. & Dorothy Willie Professor of Law, University of Iowa. © 2012, Herbert Hovenkamp.

firms can profitably maintain prices that are significantly above costs. The ability to do this is called market “power.” Thus, we sometimes say that a market is the grouping of sales controlled by a hypothetical monopolist or collusive group.¹ Further, a relevant antitrust market consists of firms that are not merely rivals, but also that are sufficiently close rivals that the competition of the others is able to hold each firm’s prices relatively close to its costs. That is to say, mere substitution is not sufficient; it must be substitution at a price close to cost. Having delineated a relevant market, antitrust decision makers next examine single-firm market share data or information about the number and size-distribution of firms in order to assess how a particular action might harm competition. Alternatively, sometimes we assess market power by observing price–costs relationships and consumer behavior directly, without engaging in market definition.² In many cases, however, antitrust case law requiring a showing of market power also requires a market definition, even if technical economic methodologies do not.

As Lemley and McKenna suggest in their article on market definition, the set of conceptions and procedures that go into “market definition” in antitrust can be quite different from those that go into market definition in IP law.³ When the issue of market definition appears in IP cases, it is mainly as a query about the range over which rivalry occurs. This rivalry may or may not have much to do with a firm’s ability to charge a high price. For example, a trademark infringer may steal sales from the senior mark’s owner even though the two firms are operating in a competitive market and neither could ever expect to charge much more than the competitive price. Even in patent law, firms who own patents on their products or processes may bring infringement suits against rivals, even though both parties compete with dozens of other firms. To borrow an illustration from the authors’ title, if Coke should accuse Pepsi of stealing its trade secrets or copyrighted promotional material, it really would not matter if Coke and Pepsi were in competition with other soft drink brands that were sufficient to hold Coke and Pepsi’s prices to cost—although that fact might be necessary to the computation of damages. In sum, although the scope of the market is often relevant in IP infringement or remedies cases, antitrust’s requirement of market *power* is not.

Lemley and McKenna suggest that one problem with antitrust market definition is that it has become too “ossified” to the extent it relies on static

1. For a good recent example of the approach, see *United States v. H & R Block, Inc.*, No. 11–00948, 2011 WL 5438955, at *8 (D.D.C. Nov. 10, 2011) (relevant market consists of computer tax programs and not all commercial methods of tax preparation).

2. See 2B PHILLIP E. AREEDA, HERBERT HOVENKAMP & JOHN L. SOLOW, *ANTITRUST LAW* ¶¶ 515, 521c (3d ed. 2007); see also Herbert Hovenkamp, *Markets in Merger Analysis*, 57 *ANTITRUST BULL.* (forthcoming 2012) (manuscript at 13 (citation omitted)), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1945964.

3. Mark A. Lemley & Mark P. McKenna, *Is Pepsi Really a Substitute for Coke? Market Definition in Antitrust and IP*, 100 *GEO. L.J.* 2055, 2056–59 (2012).

assumptions about changes in price and output but ignores or downplays the role of innovation.⁴ Historically, that criticism is well-taken. Antitrust policy makers have been aware of this problem for years, however, and have responded with tools that require looking not merely at the current market, but also at movements that might affect the exercise of market power in the future. I disagree, however, with their conclusion that “direct” measures, which attempt to assess power without the need for market definition, are necessarily superior in this regard.⁵ These alternative empirical methodologies, which economists have developed over the last two decades, try to assess power by measuring customer responses directly—asking, for example, how many sales or how much revenue would be lost if a firm increases its prices by a given amount. These methodologies make it possible to assess an individual firm’s power over price, or the effects of a merger, without defining a relevant market.⁶ Direct estimate methodologies, however, are pure “snapshots” of customer responses to price changes, taking no account of the ability of other firms to make their own products more attractive.⁷ That is, they are, if anything, even more indifferent to innovation than the classical market definition methodologies that we use today.

The 2010 Horizontal Merger Guidelines have addressed this problem by considering the ability of other firms to innovate and thus alter consumer choices from the current measure,⁸ but the very generality of the query indicates its limitations. With or without market definition, market power assessment will probably never do a good job of taking innovation into account because innovation is so badly behaved, often producing completely unanticipated results. This constraint applies to both traditional and nontraditional forms of market power analysis. As a result, a fact-finding such as the one in *Microsoft* that a relevant market exists for “Intel-compatible” computer operating systems⁹ is extremely vulnerable to technological change, but a conclusion about power that examined purchasing shifts in response to direct price changes would have been equally vulnerable. Technological change is exogenous to both approaches. Neither considers a variety of factors, such as the possibility that Apple might switch to an Intel-based system, which occurred less than a decade

4. *Id.* at 2058.

5. *See id.* at 2101–16.

6. *See, e.g.*, Louis Kaplow, *Why (Ever) Define Markets?*, 124 HARV. L. REV. 437, 479 n.80 (2010). For a summary of the methodologies, see HERBERT HOVENKAMP, *FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE* §§ 12.3–12.5 (4th ed. 2011).

7. *See* Dennis W. Carlton, *Revising the Horizontal Merger Guidelines*, 6 J. COMPETITION L. & ECON. 619, 638–39 (2010); Herbert Hovenkamp, *Harm to Competition Under the 2010 Horizontal Merger Guidelines*, 39 REV. INDUS. ORG. 3, 11–12 (2011).

8. *See* U.S. Dep’t of Justice & Fed. Trade Comm’n, *Horizontal Merger Guidelines* § 6.4 & ex. 19 (2010), available at <http://www.justice.gov/atr/public/guidelines/hmg-2010.html>. On the use of nonmarket share-based estimates of power in innovation-intensive markets, see Hovenkamp, *supra* note 2.

9. *See* *United States v. Microsoft Corp.*, 253 F.3d 34, 50, 54 (D.C. Cir. 2001).

later,¹⁰ or that rivals might develop both Intel-based and non-Intel-based systems that would compete effectively with Windows. Making these predictions requires a crystal ball that neither traditional relevant market criteria nor direct measurement can provide.

Antitrust is more sensitive to market structure than any discipline, despite that the relevant statutes say little about structure.¹¹ It has either developed or borrowed technical conceptions of market concentration, market power, market share, entry barriers, and economies of scale and scope, all of which can go into an antitrust assessment of competitive effects.¹² By contrast, the IP laws say almost nothing about structure and largely proceed without these inquiries. Intellectual property law could have gone down a different route. In the last half century in particular, we have learned much about the relationship between market structure and innovation—about the types of industries in which patents work better and are more valuable, those in which trade secrets are preferred, or where first-mover advantages alone provide sufficient incentives. We know a great deal about where copying is easiest, thus justifying strong protection, and where it is much more difficult. Knowing all of this, IP law might have developed much more “market specific” rules than it has, and if those rules had been properly formulated and applied, we would be in a better place than we are today.¹³ This might have happened in one of two ways: first, the specifications could have been spelled out in a much lengthier statute that related various elements of market structure to different specifications of IP duration or scope. Second, as in antitrust, Congress might have passed a statute that simply authorized courts to take structural issues into account when they assessed the scope of IP rights and infringement.

What we have, however, are IP laws that proceed as if market structure does not matter. To be sure, there is less consensus and poorer quality information about the relationship between market structure and innovation than about the relationship between market structure and traditional power over price under constant technology. But that hardly justifies a set of protections that are invariant to market structure in those areas where it counts most. In the Supreme Court’s *Prometheus* decision, briefly discussed below, Justice Breyer’s

10. See Press Release, Apple Inc., Apple to Use Intel Microprocessors Beginning in 2006 (June 6, 2005), <http://www.apple.com/pr/library/2005/06/06Apple-to-Use-Intel-Microprocessors-Beginning-in-2006.html> (announcing plans to transition to Intel microprocessors in all of its Macs by the end of 2007).

11. Section 1 of the Sherman Act, 15 U.S.C. § 1 (2006), says nothing whatsoever about market structure. Section 2, *id.* § 2, makes it unlawful to “monopolize” but does not define that term. Various Clayton Act provisions make it unlawful to engage in specific practices whose effect may be to “substantially lessen competition or tend to create a monopoly,” without relating those terms to structure. See, e.g., *id.* § 14 (tying and exclusive dealing); *id.* § 18 (mergers).

12. See 2B AREEDA, HOVENKAMP & SOLOW, *supra* note 2, at chs. 5 & 6.

13. One exception is the Digital Millennium Copyright Act (DMCA), Pub. L. No. 105-304, 112 Stat. 2860 (1998), which protects digital works and thus includes “market specific” rules. See also Plant Patent Act, 35 U.S.C. § 161 (2006) (applying IP-like protections for plants); Plant Variety Protection Act, 7 U.S.C. §§ 2321–2582 (2006 & Supp. 2009) (same).

opinion for a unanimous Court may have opened a narrow window for differentiating the application of patent law with the market in question.¹⁴

In any event, as Lemley and McKenna point out, IP law sometimes employs concepts of market definition, although these are mainly in the areas where it does not count most.¹⁵ This Response argues that the conception of “market definition” in IP has two meanings that apply in different circumstances. First, when we are speaking strictly about the scope of IP rights and remedies for infringement, the relevant concept of “market definition” really refers to the range of interfirm rivalry. The question in these cases concerns mainly the identification of an IP holder’s rivals and the degree of substitution between them, but it is not generally concerned with market power. Further, often the rivals who are considered are the rights holder and the infringer but not other firms in the market. Second, when we consider a variety of postissuance practices, antitrust’s more technical understanding of market power becomes relevant. However, these latter situations are more typically addressed under antitrust or misuse principles.

I. HOW MARKETS ARE RELEVANT

A. MARKETS VS. BRANDS

Lemley and McKenna suggest that the antitrust methodology for assessing markets tends to produce small markets, often limited to a single brand.¹⁶ For example, Coke and Pepsi may be in different markets.¹⁷ Historically, however, this has not been the case.¹⁸ Indeed, antitrust law has found that a single firm’s brand constitutes a relevant market in only a few situations,¹⁹ such as when the purchaser of a specialized piece of durable equipment is locked in by this purchase and must buy that firm’s aftermarket supplies or services as well.²⁰ As a result, practices such as exclusive dealing in markets for branded products are never antitrust violations unless the branded seller independently has market power based on shares of a more general product market.²¹

14. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1294 (2012); *see also infra* note 82 and accompanying text.

15. *See* Lemley & McKenna, *supra* note 3, at 2059–60.

16. *See id.* at 2080–91.

17. *See id.*

18. *PepsiCo, Inc. v. Coca-Cola Co.*, 114 F. Supp. 2d 243, 255–56 (S.D.N.Y. 2000) (single market for all soft cola drinks distributed by fountain); *see also* *PepsiCo, Inc. v. Coca-Cola Co.*, 315 F.3d 101, 108 (2d Cir. 2002) (Coke lacked market power sufficient to support a monopolization claim).

19. *See* 2B AREEDA, HOVENKAMP & SOLOW, *supra* note 2, at ¶ 563d.

20. *See, e.g., Eastman Kodak Co. v. Image Tech. Servs., Inc.*, 504 U.S. 451, 481–82 (1992); 2B AREEDA, HOVENKAMP & SOLOW, *supra* note 2, at ¶ 564b.

21. *E.g., Sheridan v. Marathon Petrol. Co.*, 530 F.3d 590, 595 (7th Cir. 2008) (noting that market power could not be inferred from Marathon’s trademark and brand); *Rick-Mik Enters. v. Equilon Enters.*, 532 F.3d 963, 973 (9th Cir. 2008) (explaining that, even when operating as a joint venture, the Shell and Texaco brands did not confer enough market power to warrant a conclusion of market power).

For some period of time, antitrust policy did tend to define markets in terms of a single seller's products when they were covered by intellectual property rights. In its *Illinois Tool Works* decision in 2006, however, the Supreme Court overturned a long-standing presumption that holding a patent created market power for antitrust purposes.²² That decision expressly overruled the *Loew's* decision, which had concluded that market power could be inferred from the copyright on a movie.²³ It also implicitly overruled decisions such as *Chicken Delight*, which had held that market power could be inferred from a trademark,²⁴ as recognized by lower courts.²⁵

Lemley and McKenna cite evidence that many customers are willing to pay a premium for their first choice brand over their second choice.²⁶ But that observation tells us little about market definition unless we know the answers to some important additional questions. The first is premium over what: cost or the current price? Further, are the studies about paper towels or automobiles? As they observe, the data are not specific about the product. The data they cite suggest that 50% of customers would pay a 25% premium over their second choice.²⁷ Does this mean that, if Toyota raised the price of a Highlander from \$30,000 to \$40,000, 50% of customers would continue to buy the Highlander rather than pay \$30,000 for its closest rival, the Honda Pilot? Finally, the information is useless if the "premium" price reflects quality differences that show up in cost. For example, branded paper towels may cost 25% more because they have absorption or durability qualities that consumers desire, but they also cost 25% more to make. Or a Volvo may cost more than a Ford of similar size and performance because the Volvo employs more costly safety devices.

Occasionally antitrust cases find single-brand markets,²⁸ but today this is almost always because there is market dominance in an underlying product. For example, Microsoft Windows was found to have substantial market power, but neither the company name "Microsoft" nor the product name "Windows" was relevant to that decision.²⁹ Indeed, the same court refused to find that Microsoft's branded internet browser, Internet Explorer, dominated a relevant market.³⁰ Rather, what mattered was that the court found a relevant market for a

22. See *Ill. Tool Works, Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 31 (2006).

23. See *United States v. Loew's, Inc.*, 371 U.S. 38, 45–46 (1962), *abrogated by Ill. Tool Works*, 547 U.S. at 28.

24. *Siegel v. Chicken Delight, Inc.*, 448 F.2d 43, 50 (9th Cir. 1971), *abrogated as recognized by Rick-Mik*, 532 F.3d at 963.

25. See, e.g., *Rick-Mik*, 532 F.3d at 974 n.3 (recognizing decisions like *Illinois Works* have *abrogated Chicken Delight*); *Sheridan*, 530 F.3d at 593–94 (same).

26. See Lemley & McKenna, *supra* note 3, at 2086.

27. See *id.*

28. See, e.g., *Image Tech. Servs., Inc. v. Eastman Kodak Co.*, 125 F.3d 1195, 1203–04 (9th Cir. 1997) (Kodak branded parts and service), *cert. denied*, 523 U.S. 1094 (1998); see also 2B AREEDA, HOVENKAMP & SOLOW, *supra* note 2, at ¶ 563d (discussing other cases).

29. See *United States v. Microsoft Corp.*, 253 F.3d 34, 54–56 (D.C. Cir. 2001).

30. *Id.* at 82–84.

particular type of computer operating system not readily interchangeable with others and that Windows occupied some 95% of that market; by contrast, the market for internet browsers was not well-defined.³¹

B. PRODUCT BOUNDARIES VS. MARKET BOUNDARIES

Most IP rights are too narrow to confer much in the way of market power. This generally applies to patents and even more forcefully to copyrights and trademarks. The power of IP rights is “boundary exclusion” but only rarely “market exclusion.”³² For example, a farmer has the boundary exclusion power to exclude trespassers from her corn patch, but that power rarely confers any power over the price of corn or even farmland.

A few pioneer patents do confer significant market power, particularly if they are broadly interpreted. For example, the Wright Brothers’ patent was able to shut out alternative aircraft in the United States for some time thanks to a broad interpretation under the doctrine of equivalents.³³ Most patents do nothing of the kind, which is not to say that patents are irrelevant to determinations of market power. Historically, patent portfolios have been one of many factors that courts have considered in determining the scope of a firm’s market power. Copyrights confer significant power rarely and trademarks more rarely still.

What IP rights do grant is an asset that may be impossible for others to duplicate. This power to exclude has value, depending on both its legal strength and its market strength. Before such an asset leads to power, however, it must produce an advantage in either cost or attraction to consumers. A patent may be strong legally but still not offer much exclusionary power if nobody wants what it has to offer. Copyrights are only as valuable as the works to which they are attached, and these often become economically worthless long before the copyright expires.

So it is almost never correct to say that an IP right confers market power. A better way to state the issue is that an IP right may grant freedom from duplication and thus permit appropriation of whatever value an underlying asset already has. But if it is attached to something of no value, then the IP right will not confer any value. This is true of boundary exclusion generally. The right to keep people out of my bean patch gives me the right to appropriate whatever productive value the patch has. If the patch is rocky, without water, and worthless to begin with, however, the fence and no trespassing signs will not add any value to it. My title could be rock solid but my property is still worthless.

31. Compare *id.* at 54–56, with *id.* at 82–84.

32. See CHRISTINA BOHANNAN & HERBERT HOVENKAMP, CREATION WITHOUT RESTRAINT: PROMOTING LIBERTY AND RIVALRY IN INNOVATION ch. 4 (2012).

33. See *Wright Co. v. Herring-Curtiss Co.*, 204 F. 597, 614 (W.D.N.Y. 1913); see also Robert P. Merges & Richard R. Nelson, *On the Complex Economics of Patent Scope*, 90 COLUM. L. REV. 839, 890–91 (1990).

C. MEASURING POWER WITHOUT MARKET DEFINITION: FIXED COSTS

One place where IP rights create an image of market power can often be an illusion, created by some of the nonmarket-share measurement tools that we use for assessing power, such as cost–price margins. For example, the Lerner Index assesses market power by looking at the relationship between price and marginal cost. The index, which is $(P - MC)/P$, reads in a range from zero in a perfectly competitive market, where price equals marginal cost, to one in a market in which the ratio of price to marginal cost is infinitely high.³⁴ Formally, it can measure the market power of a single firm without requiring a market definition.

The Lerner Index can create an illusion of market power because, in many IP-rich markets, the ratio of fixed to variable costs is extremely high, and marginal cost measures only variable cost. A good example is digital media. It costs millions of dollars to develop a program such as Microsoft Office, but once developed, the program can be burned to a DVD for a few cents or perhaps downloaded for virtually nothing. If the sale price is in fact \$250, this gives a Lerner Index reading that is off the charts and suggests enormous market power. In such cases, we can assess power only by looking at a product's full lifecycle and determining whether total revenues were sufficient to cover investment costs. For example, if developing Windows costs \$100,000,000 and Microsoft sells 1,000,000 copies over the product's lifecycle, then \$100 per copy would be required to cover the fixed costs alone. If one looks at short run production costs alone, most books cost no more than \$8 or \$10 to make, but they typically sell for prices ranging from \$25 to \$100 or even more. This suggests a great deal of monopoly power, but the fact is that most of these "monopolies" end up in the remainder bin six months after they are printed.

Lemley and McKenna suggest that, conceding the presence of high fixed costs in IP-intensive markets, marginal cost might be the better measure of market power in any event because "allocating fixed costs to IP-protected products seems to confuse market definition and market power analysis with the policy desirability of allowing companies to recoup these costs."³⁵ But this assumes that antitrust currently defines markets strictly by looking at marginal cost when, in fact, it does not. In the short run, firms increase output when the price exceeds marginal cost. But longer run supply responses require the construction of fixed cost assets, and antitrust policy routinely considers these as well. For example, measuring entry barriers into a market requires asking whether a firm can reasonably anticipate that it will recover its fixed cost

34. See HOVENKAMP, *supra* note 6, at § 3.1a; see also William M. Landes & Richard A. Posner, *Market Power in Antitrust Cases*, 94 HARV. L. REV. 937, 939–40 & fig.1 (1981); A. P. Lerner, *The Concept of Monopoly and the Measurement of Monopoly Power*, 1 REV. ECON. STUD. 157, 169 (1934).

35. Lemley & McKenna, *supra* note 3, at 2096.

investment in the new enterprise.³⁶ Indeed, one of the difficulties of the “direct” measurement methodologies of market power that do not depend on market definition is that they do not employ a useful concept of resource redeployment. To the extent that they ignore the ability of rivals to redeploy resources into new products or new configurations, they tend to exaggerate power. The 2010 Horizontal Merger Guidelines have attempted an as yet untried corrective for this.³⁷ In this sense, traditional market definition measures are probably superior to direct measures because they take new investment into account. For example, the relevant market query in mergers and some other antitrust analysis does not consider who is in the market right now at current prices but rather who *would be* in the market if a small but significant and nontransitory price increase should occur.³⁸

II. QUESTIONS OF IP SCOPE AND REMEDIES: MARKET DELINEATION BUT RARELY MARKET POWER

A. IP AND ANTITRUST INQUIRIES: IMPORTANT SIMILARITIES AND DIFFERENCES

As Lemley and McKenna illustrate, IP law engages in a form of “market definition” in a wide variety of contexts. Specifically, IP law often uses substitution or market criteria in order to make decisions about the scope of IP rights or the remedies they confer. For example, in IP law the measurement of damages often poses a problem of demand substitution—indeed, the lack of provable substitution suggests why both patent and copyright law offer deviations from common law damages methods (that is, lost sales), adopting instead formulations such as lost licensing fees or, in the case of copyright, profits earned by the infringer.³⁹

At the simplest level, the damages problem is one of market substitution, which requires an idea about who and what are in the market. For example, in an extreme case, a patentee might have a product monopoly and a single infringer makes a precise copy of the patented product. The inference is strong that each sale by the infringer steals a sale from the patentee in a one-to-one ratio. Things begin to break down, however, when (1) the market contains more than these two firms or (2) the patentee’s product and the infringer’s product are differentiated from one another. They are complicated even further when the patentee and the infringer have different costs, perhaps because the infringer is a copyist who did not bear innovation expenses but has only production costs. For

36. See HOVENKAMP, *supra* note 6, at §§ 1.6, 3.5c.

37. See *supra* note 8 and accompanying text.

38. HOVENKAMP, *supra* note 6, at § 3.2.

39. See 17 U.S.C. § 504(a) (2006) (noting that copyright damages can equal “actual damages and any additional profits of the infringer” or statutory damages); 35 U.S.C. § 284 (2006), *amended by Leahy-Smith America Invents Act*, Pub. L. No. 112-29, § 20(j), 125 Stat. 284, 335 (2012) (noting that patent damages are “adequate to compensate for the infringement, but in no event less than a reasonable royalty”); see also BOHANNAN & HOVENKAMP, *supra* note 32, at chs. 3 & 6.

example, the pirate selling hacked copies of Microsoft Office could probably charge \$3 per copy. In this case, the hacker not only steals sales but also brings into the market many people who were unwilling to pay Microsoft's \$250 price.

Significantly, these complicating factors are the rule, not the exception. If the patentee is not a product monopolist but rather one of several firms, then sales by the infringer do not measure lost sales to the patentee because at least some of the infringer's sales will be taken from other manufacturers in the market.⁴⁰ If the primary and infringing products are differentiated, customer substitution will also be complicated, and the complications only increase as the patented technology is a smaller portion of the entire product.

Lemley and McKenna suggest that these problems involve "the classic hallmarks of antitrust market definition and power analysis."⁴¹ This is true in at least a crude sense. Measuring the diverted sales from patent infringement could involve methodologies for estimating "diversion ratios" of products from one firm to another, methodologies such as those used in antitrust analysis of mergers. Depending on the availability of data, one might estimate the demand for the patentee's product in situations where the infringer's product is and is not present. This method could provide information both about how many sales the patentee lost to the infringer and also about whether the patentee had to cut its product price in order to compete with the infringer.⁴²

But these methodologies are used as an alternative to market definition—indeed, that explains why they are so controversial in antitrust cases—because the Supreme Court appears to insist on a market definition even though the latest economic methodologies do not.⁴³ In sum, such methodologies are really not approaches to market definition at all but rather statistical estimates of diverted sales based on demand and pricing relationships.

Various "alternative" measures of damages authorized under the Patent and Copyright Acts—namely lost licensing fees, infringer's profits, or statutory damages—are all designed to enable patent and copyright law to get away from market definition issues altogether. Licenses are seller-buyer relationships that are fundamentally vertical or complementary rather than horizontal, although, of course, the licensor and licensee may also happen to be competitors. In order

40. Justice Holmes encountered this problem already in a common law tort case of palming off. See *Mosler Safe Co. v. Ely-Norris Safe Co.*, 273 U.S. 132, 134 (1927) (holding that, where plaintiff had numerous competitors making similar safes, plaintiff could not show that defendant's sales were taken exclusively from plaintiff).

41. Lemley & McKenna, *supra* note 3, at 2070.

42. On the use of diversion ratios to assess competitive harm in merger cases, see Joseph Farrell & Carl Shapiro, *Recapture, Pass-Through, and Market Definition*, 76 ANTITRUST L.J. 585 (2010) and Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, 10 B.E. J. OF THEORETICAL ECON., no. 1, 2010, at Article 9, available at <http://www.bepress.com/bejte/vol10/iss1/art9>. For a good history of the use of such methodologies in merger analysis since the late 1990s, see David Scheffman, Malcolm Coate & Louis Silvia, *Twenty Years of Merger Guidelines Enforcement at the FTC: An Economic Perspective*, 71 ANTITRUST L.J. 277 (2003).

43. See Hovenkamp, *supra* note 2, at 5–8.

to estimate lost licensing revenue we do not need to know who the IP owner's competitors are; we may need to know, however, who the other licensees are (but only for purposes of comparison) and they are likely not to be competitors.

By the same token, infringer's profits under the Copyright Act are not intended to be a mere surrogate for market substitution damages that cannot be assessed, as would be true in a case involving competitors in the same market. Lost profit damages are typically assessed when the copyright holder owns a song or work of art or fiction and the infringer incorporates part of it into a noncompeting work, such as a promotional campaign, television commercial, or musical.⁴⁴ Once again, the relationship between the rights holder and the infringer is best characterized as vertical, or perhaps complementary, but not competitive.

Another important difference between antitrust and IP has to do with the relationship between the legal violation and market output. Antitrust condemns practices that tend to increase prices by reducing market output, often making it essential to define the market. Indeed, one of the reasons that antitrust policy has been restrictive about competitor lawsuits is that so many of them fail to identify any kind of relationship between the challenged violation and reduced market output.⁴⁵ For example, the rival in the tied market challenging the dominant firm's tying arrangement might readily be able to show that it lost sales because of the tie. But a condition for illegality is that the tie be anticompetitive, which requires a showing that either the actual or natural tendency of the tie is to reduce output in the tied product market, producing higher prices.⁴⁶ This assessment classically requires a market definition.

By contrast, IP infringement almost always increases output. That is to say, the IP holder's output losses from substitution are virtually never as large as the infringer's gains. In many cases, the IP holder does not suffer any actual losses at all, such as when the infringing good is a complement rather than a substitute. In other cases, the infringer's product steals sales from multiple rivals, some of whose products did not infringe. Output increases are *ceteris paribus* a good thing and they benefit consumers so IP infringements also benefit consumers in the short run. Indeed, they are socially harmful only on the premise that they reduce the incentive to innovate in future situations, thus leading to less creative production. This makes "substitution harm" unsuitable for most IP cases; the problem is not simply one of proof but of fundamental conception.

44. *E.g.*, *Andreas v. Volkswagen of Am., Inc.*, 336 F.3d 789, 791–92 (8th Cir. 2003) (addressing defendant's use of copyright holder's slogan on a drawing in its automobile commercial); *Bouchat v. Balt. Ravens Football Club, Inc.*, 346 F.3d 514, 516–17 (4th Cir. 2003) (football team incorporated plaintiff's drawing); *Mackie v. Rieser*, 296 F.3d 909, 911–14 (9th Cir. 2002) (infringer Seattle Symphony engaged in promotional campaign that incorporated plaintiff's art work).

45. See BOHANNAN & HOVENKAMP, *supra* note 32, at ch. 3.

46. *E.g.*, *Jefferson Parish Hosp. Dist. No. 2 v. Hyde*, 466 U.S. 2, 24–25 (1984), *abrogated on other grounds by Ill. Tool Works, Inc. v. Indep. Ink, Inc.*, 547 U.S. 28 (2006) (noting that the lack of market power precluded independent anesthesiologist's claim that defendant hospital tied its own anesthesiological services).

B. MARKET DELINEATION IN CASES INVOLVING DESIGN, EXPRESSION, AND FUNCTION

As Lemley and McKenna point out, the relationship between “design” and market definition shows up in a number of ways but most particularly when elements of design or expression spill over into functionality.⁴⁷ A “design” that commandeers the entire set of reasonable alternatives can end up dominating a market. For example, if one could patent a wheel’s roundness as a “design,” she could effectively hijack the entire market for wheels and tires; square wheels do not roll nearly as well.

IP law uses several devices in order to prevent design boundaries from overreaching. For example, the doctrine of functionality in trademark law, particularly the law of trade dress, limits the use of marks so as to protect design but not function.⁴⁸ Obtaining a trademark—and thus, the power to exclude—for something that is functional is somewhat akin to obtaining a patent of indefinite length without meeting patent law’s much stricter requirements for protection.⁴⁹ As Lemley and McKenna point out, assessing the relationship between trademark law and functionality often entails identifying the relevant range of competitive alternatives—that is, a form of market delineation.⁵⁰ They show that similar concerns are relevant to trademarks that are determined to have become generic—essentially meaning that the name has migrated from manufacturer or brand identity to market identity. In order to make this determination, however, one must identify the range of rivalry.⁵¹ Significantly, these cases are not concerned with market power at all and certainly not in the sense that market power is a prerequisite to a finding of overreaching. Indeed, the cases often involve disputes between two firms, neither of which is dominant in its market.⁵²

Copyright law poses similar problems when copyrighted “expression” spills over into function.⁵³ The problem frequently arises in cases that involve software when a particular expression exhausts the available alternatives for carrying out a particular function. For example, there are only so many ways to say “print” or “delete file” in a computer program and only so many ways of organizing pull-down menus or other operator readable instructions.⁵⁴ In these cases, the copyright holder may be using a protection of its “expression” as a

47. See Lemley & McKenna, *supra* note 3, at 2060.

48. See, e.g., *Traffix Devices, Inc. v. Mktg. Displays, Inc.*, 532 U.S. 23, 29 (2001) (“[T]rade dress protection may not be claimed for product features that are functional.”).

49. See *id.*; see also Lemley & McKenna, *supra* note 3, at 2060.

50. Lemley & McKenna, *supra* note 3, at 2060.

51. *Id.* at 2066.

52. See, e.g., *Stormy Clime, Ltd. v. ProGroup, Inc.*, 809 F.2d 971, 972–73 (2d Cir. 1987) (considering whether trademarked design features were, in fact, functional; plaintiff’s product sales in market for rain apparel were approximately \$2.1 million annually).

53. Lemley & McKenna, *supra* note 3, at 2073 (discussing particularly *Mattel, Inc. v. MGA Entm’t, Inc.*, 616 F.3d 904 (9th Cir. 2010)).

54. E.g., *Lotus Dev. Corp. v. Borland Int’l, Inc.*, 49 F.3d 807, 815–17 (1st Cir. 1995) (finding plaintiff’s menu command is an uncopyrightable method of operation).

device for limiting the availability of competitive alternatives. Once again, the impact can be assessed only by examining the range of alternatives that the market offers. But this is certainly not market definition in the antitrust sense. In this case, the query does not necessarily consider the identity or number of firms in the market at all but rather the alternative ways of expressing a command that performs a specific function. Overly broad assertions may constitute “misuse,” but in that case we have moved from IP to essentially antitrust criteria for assessing competitive effects.⁵⁵

A related area that Lemley and McKenna did not mention is design patents, which raise competition issues when a design serves to limit interoperability with the products of competitors. For example, by obtaining a design patent on an aftermarket automobile part such as a bumper, an automobile manufacturer might try to prevent downstream rivals from building aftermarket bumpers for its cars. The manufacturer would do so not because of any technological feature in the bumper, but merely because the only way to make a bumper that will “interconnect” with a Chrysler is to infringe the design patent.⁵⁶ The issue has come up in a number of other contexts, including the relationship between printers and ink cartridges⁵⁷ as well as between locks and key blanks.⁵⁸ Significantly, Chrysler is not a monopolist and its aftermarket bumper “tie” would probably be lawful under the antitrust laws. But the interconnection issue forecloses application of a design patent with no query at all into market structure.

C. IP RIGHTS AND PRODUCT DIFFERENTIATION

Product differentiation and IP rights often go hand in hand. Product differentiation is generally profitable to producers, and profits are larger because a firm can increase the “distance” in product space between itself and its rivals. Harold Hotelling famously modeled product differentiation in a story about hot dog vendors arrayed on a beach: the farther apart they are, the higher they can price their product without losing sales to rivals.⁵⁹ Commodities are least likely to exhibit meaningful product differentiation. To be sure, coal or potatoes may

55. See *infra* notes 99–101 and accompanying text.

56. *Chrysler Motors Corp. v. Auto Body Panels of Ohio, Inc.*, 908 F.2d 951, 952–54 (Fed. Cir. 1990) (denying preliminary injunction to truck manufacturer seeking to enforce design patents in such a way as to prevent rivals in the aftermarket from making their bumpers compatible with design patentee’s trucks; affirming district court’s conclusion that bumper design was more functional than ornamental). See HERBERT HOVENKAMP, *INNOVATION AND COMPETITION POLICY: CASES AND MATERIALS* 45–47 (2010), available at <http://www.uiowa.edu/ibl/InnovationCompetitionPolicyCasebook.shtml>.

57. *Static Control Components, Inc. v. Lexmark Int’l, Inc.*, 487 F. Supp. 2d 830, 838–42 (E.D. Ky. 2007) (stating that a printer maker could not use a design patent on a microprocessor chip in order to make the printer inoperable with rivals’ print cartridges).

58. *Best Lock Corp. v. Ilco Unican Corp.*, 94 F.3d 1563, 1566 (Fed. Cir. 1996) (noting that the key blade blank for making door keys had shape and configuration dictated by functional concerns and could not be protected by design patent whose effect was to prevent rivals’ keys from fitting into the patentee’s lock).

59. Harold Hotelling, *Stability in Competition*, 39 *ECON. J.* 41, 45–48 (1929).

exhibit quality differences, may have company or product names (trademarks), and, in some cases, manufacturers may even process patents for their production. For the most part, however, IP does not play a significant role in the analysis of market power for commodities. IP has a strong role to play in markets for distinctive manufactured goods, which are precisely those markets where market definition is least useful because it invariably either exaggerates or understates power. In antitrust, many of the most vexing issues of product market definition have arisen in markets in which IP rights were a significant factor.⁶⁰

Product differentiation serves to make the traditional process of market delineation less useful in antitrust analysis. The market definition process is inherently binary in the sense that a product is either inside or outside of the market. But in a product differentiated market, both conclusions are commonly “wrong.” For example, if the inquiry concerns the market power of a maker of oil-based paint, excluding latex paint tends to exaggerate the market power of the oil paint manufacturer. It ignores competition that latex in fact provides. On the other hand, including latex paint tends to understate the market power of oil paint because it yields the conclusion that the two are perfect competitors when, in fact, there are some uses for which oil paint is preferable. This explains why the government’s merger enforcement agencies have spent the last two decades trying to develop econometric alternatives to traditional market definition.⁶¹

Lemley and McKenna argue that, to the extent antitrust market definition is based on an assumption of undifferentiated products, antitrust market definition tends to define markets too broadly.⁶² They argue that product differentiation may call for radically narrower market definitions than antitrust currently employs and perhaps even the conclusion that single brands in product differentiated markets constitute “monopolies.”⁶³ As an empirical matter, they are probably right. In many cases, courts have defined differentiated markets too broadly, ignoring the fact that many of the goods that were included were not capable of holding the defendant’s prices to cost.⁶⁴ But there are other cases in which differentiated markets were defined too narrowly. A good, recent example is the *Lundbeck* decision, in which the Eighth Circuit held that the only two

60. *E.g.*, *United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 380–81 (1956) (discussing cross-elasticity of demand of technologically diverse products; “cellophane fallacy”). On the “cellophane fallacy,” see *Eastman Kodak Co. v. Image Tech. Serv.*, 504 U.S. 451 (1992), involving aftermarkets and lock-in, *FTC v. Lundbeck, Inc.*, 650 F.3d 1236, 1240–42 (8th Cir. 2011), involving substitution rates between pioneer and generic drug in presence of third party decision making, and *United States v. Oracle Corp.*, 331 F. Supp. 2d 1098, 1121 (N.D. Cal. 2004), involving unilateral effects in product differentiated market. See also 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, *ANTITRUST LAW* ¶ 539 (3d ed. 2008).

61. See *supra* notes 4–7 and accompanying text.

62. Lemley & McKenna, *supra* note 3, at 2077.

63. *Id.*

64. *E.g.*, *E.I. du Pont*, 351 U.S. at 394–99 (placing highly distinctive cellophane, glassine, aluminum foil, and brown wrapping paper in the same market).

drugs that treated a particular condition, but which were not bioequivalents, were in different markets.⁶⁵ As a result, the merger that united them under a single firm was lawful.⁶⁶

The relationship between product differentiation and unwarranted exercises of market power is in fact quite complex. The impact of product differentiation depends in significant part on whether we are concerned about unilateral or collusive exercises of market power. On the one hand, product differentiation serves to make firms less-than-perfect competitors; that is, individually they have downward sloping demand curves. On the other hand, product differentiation also makes collusion much more difficult and cartels less stable.⁶⁷

One thing that product differentiation does not do, however, is lead to monopoly prices, at least not without some additional assumptions. This explains antitrust policy's quite appropriate reluctance to infer single-brand or narrow markets from the simple fact of differentiation. One characteristic of innovation-intensive markets is relatively high fixed costs. Under perfect competition, prices will be driven to short-run marginal cost, making it difficult for firms to obtain returns on significant fixed cost investments. The result can be that innovation will dry up. Incorporating product differentiation into our analysis changes that outcome by giving firms enough competitive distance from one another to allow them to recover a fixed cost component. As long as resources are mobile, however, returns will be above marginal cost but not significantly above average total cost.⁶⁸ That is to say, within innovation-intensive markets, "perfect competition" is a holy grail that is not worth pursuing. Not only would a world in which product differentiated firms were considered monopolists lead to extraordinarily high antitrust enforcement costs, but a goal of driving firms to perfect competition would be a significant deterrent to innovation. This conclusion is supported by substantial literature that indicates that the innovation-versus-market-structure relationship is expressed by an "inverted U" shape, suggesting that neither monopolists nor perfect competitors innovate much. Most innovation goes on in moderately concentrated product-differentiated markets.⁶⁹

65. *Lundbeck*, 650 F.3d at 1240–41.

66. *Id.* at 1240–41; see generally Herbert Hovenkamp, *Mergers, Market Dominance and the Lundbeck Case*, 12 CPI ANTITRUST CHRONICLE, Dec. 2011, at 1, available at <http://ssrn.com/abstract=1968151>.

67. See Herbert Hovenkamp & Christopher R. Leslie, *The Firm as Cartel Manager*, 64 VAND. L. REV. 813, 826 (2011).

68. The classic text on this topic is EDWARD H. CHAMBERLIN, *THE THEORY OF MONOPOLIST COMPETITION* (1933). See also RAM KRISHNA MANDAL, *MICROECONOMIC THEORY* 251–53 (2007); JEFFREY M. PERLOFF, *MICROECONOMICS: THEORY & APPLICATIONS WITH CALCULUS* 485 (2008); THE MONOPOLISTIC COMPETITION REVOLUTION IN RETROSPECT (Steven Brakman & Ben J. Heijdra eds., 2004); JEAN TIROLE, *THE THEORY OF INDUSTRIAL ORGANIZATION* 274–95 (1988). For a simple graphical analysis, see *Cost and Revenue for Monopoly and Monopolistic Competition*, WOLFRAM DEMONSTRATIONS PROJECT, <http://demonstrations.wolfram.com/CostAndRevenueForMonopolyAndMonopolisticCompetition/> (last visited July 2, 2012).

69. See BOHANNAN & HOVENKAMP, *supra* note 32, at 9–10.

Direct measurement methodologies in these situations may find significantly narrower markets than does traditional market share analysis. For example, if one asked whether a price increase to 5% or 10% above marginal cost would induce so many customers to switch from Dell Computers to other brands that the price increase would be unprofitable, the answer might be no. This would suggest that “Dell Computers” is a relevant market. But we get that answer precisely because the “snapshot” inquiry involved in such direct measurements completely ignores the ability of Dell’s rivals to innovate in response, making its product a closer or more effective substitute. Or, to state this differently, a problem with traditional market definition approaches to power is that they tend to lump Dell and other computers into the same market, ignoring the differences between them. By contrast, a problem with direct measurements based on observed customer behavior is that, although they account more fully for current product differences, they do not take innovation mobility into account.

The key assumption here is mobility. The majority of IP rights do not limit resource mobility in any important sense. In these cases, it is important not to be deceived into thinking that monopoly is present where prices are higher than short-run marginal cost. Books, software, and insulated coffee mugs with patent numbers printed on their bottoms are presumably sold at prices higher than short-run marginal cost. Unless these IP rights impose significant limitations on the ability of rivals to reconfigure their own products, the amount of profit created will not be greater than what is needed to maintain diversity in that industry. The problem arises when resources are not mobile—that is, when the occasional market shifting patent or copyrighted computer program is such a significant innovation that inventing around it is impossible.

As a policy matter, we protect most IP not because we expect that it will create monopoly, but rather because it will create sufficient product differentiation to justify short-run returns above marginal cost that are sufficient to incentivize the significant fixed cost investment that innovation requires. The inducement for creating it is the prospect of these returns. Brand names, novelists, song writers, and most patentees and holders of trade secrets do not constitute monopolies. However, they sometimes do create products that are sufficiently distinguishable in the eyes of consumers that they are worth the costs of acquiring or maintaining the IP right. The value added comes from most consumers’ preference for diversity in product offerings. We do not want to read the same novel, listen to the same song, or eat the same prepared food over and over again, even though these products might be cheaper if there were only one version that could be produced in enormous quantities and sold under perfect competition.

D. COMPETITION POLICY, MARKET DELINEATION, AND IP SCOPE

Some problems of IP scope do present market definition issues that come a little closer to the concerns of antitrust policy, which is to limit practices that reduce market-wide output or restrain innovation. In most cases, however, IP

policy does not require definition of a market so much as an understanding of the relationship between the IP holder and the accused infringer or, in some cases, the IP holder and subsequent innovators in the same field. For example, in interpreting the scope of fair use in copyright, we really do not need to define a market, although we may have to examine the relationship between the copyright owner's product and the product of the defendant who claims fair use.

At the same time, however, questions about market impact may be relevant. For example, the fair use requirement of harm to the market for the copyrighted work may require a court to identify what that market is.⁷⁰ Once again, however, the issue is not power but rather the impact of the infringer's sales on the rights holder. Further, what courts actually do in measuring harm to the market in a copyright case bears little resemblance to what an antitrust court does in order to measure market harm. In antitrust, market harm consists of reduced market output, higher prices, or, in some cases, market exclusion that creates an inference of one of these things. In fair use cases, on the other hand, one can find a few examples of such harm. For example, in *Harper & Row, Time* magazine cancelled its purchase agreement after infringer *The Nation* published some excerpts from former President Gerald Ford's memoirs.⁷¹ The loss of a large sale could certainly constitute market harm, but the Supreme Court did not even think about what the "market" was. Apparently, it assumed that the market was "President Ford's Memoirs" and never examined the impact of *The Nation's* theft on memoirs generally, books generally, or any other product category. So "harm to the market" really meant "harm to the plaintiff"—a proposition that antitrust policy categorically rejects.⁷² Other fair use "harm to the market" cases do not do this much and often find harm to the market without any evidence of reduced output, higher prices, or even economic harm to the plaintiff.⁷³

In any event, I agree with nearly all of Lemley and McKenna's recommendations about scope, whether evaluating scope requires a process akin to antitrust market definition. First, copyright protection must cut a narrower path through the range of derivative works.⁷⁴ This is only rarely a market definition problem, however, because derivative works are often not competing goods at all but rather complements or unrelated goods.⁷⁵ Primary products typically do not compete with parodies; Beanie Babies, for instance, do not compete with books about Beanie Babies. The "market definition" question, insofar as competition

70. See Lemley & McKenna, *supra* note 3, at 2074.

71. *Harper & Row, Publishers v. Nation Enters.*, 471 U.S. 539, 541–42 (1985).

72. See BOHANNAN & HOVENKAMP, *supra* note 32, at 47–56.

73. *E.g.*, *Princeton Univ. Press v. Mich. Document Servs., Inc.*, 99 F.3d 1381, 1396 (6th Cir. 1996); *see id.* at 1396 (Merritt, J., dissenting) ("[P]laintiffs here have failed to demonstrate that the photocopying done by defendant has caused even marginal economic harm to their publishing business."); *see also* BOHANNAN & HOVENKAMP, *supra* note 32, at 141–42.

74. Lemley & McKenna, *supra* note 3, at 2104–07.

75. See BOHANNAN & HOVENKAMP, *supra* note 32, at 151–52.

is concerned, arises only when the accused derivative work is a substitute for the primary work and has at least enough proximity to take some of its sales. For most derivative works, the real injury to the copyright holder, if any, comes from lost licensing fees rather than from market substitution.

The issue is a little clearer in trademark law because so many instances of substantial similarity also involve competing products. One problem here occurs when trademark law is used to suppress competition by limiting comparative advertising or the number of avenues along which consumers can compare products. That is why it is so critical that an accused trademark infringer use the mark “as a mark” and not simply as a device for getting its own clearly distinguishable products before consumers in a comparative environment.⁷⁶ “Trademark use” is thus one area in which trademark policy can usefully incorporate concerns about competition policy.

The most troublesome area concerning IP scope is patent rights, because it is here that the strongest relationships exist between market structure and innovation. The problems are manifold and the literature is vast, reaching such issues as the proper breadth of the doctrine of equivalents, continuations and after-arising technologies, or the level of abstraction that the patent system should tolerate.⁷⁷ These issues often arise when patent claims are not associated closely enough with specific technology or sometimes where the patent does not claim any technology whatsoever, but only a method of marketing or selling something using technologies that have been developed by others.⁷⁸

The way in which market delineation should factor into this analysis is a complex question. The problems are often related to competition and even to market structure. For example, an overly broad doctrine of equivalents can serve to stifle competing inventions, thus protecting or enlarging any monopoly that a patentee may have. By contrast, an overly narrow doctrine may stifle innovation by permitting later actors to invent around primary inventions, thereby depriving them of market value. By and large, however, the courts address these issues by looking at the relationship between the patentee’s technology and that of the alleged infringer, not at the general market structure. One notable exception is Judge Newman’s dissent from the Federal Circuit’s decision in *Festo*, which the Supreme Court ultimately reversed, although not on the grounds that Judge Newman urged. In arguing for a broad patent doctrine of equivalents, Judge Newman referenced the famous Schumpeter–Arrow “debate” over the relationship between market structure and innovation and sided with Schumpeter.⁷⁹ She argued for broad patent protection that would grant

76. Lemley & McKenna, *supra* note 3, at 2111; *see, e.g.*, 1-800 Contacts, Inc. v. WhenU.com, Inc., 414 F.3d 400, 402–03 (2d Cir. 2005).

77. For a summary and analysis, *see* BOHANNAN & HOVENKAMP, *supra* note 32, at chs. 1, 4 & 5.

78. *Id.* at ch. 5.

79. *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 640 (Fed. Cir. 2000), *rev’d*, 535 U.S. 722 (2002). The word “debate” is placed in quotation marks because not only did Arrow write twenty years after Schumpeter, but Schumpeter (1883–1950) had already been dead for ten

sufficiently broad scope to the inventor who opens a new field, to provide adequate economic incentives while avoiding duplication of effort and discouraging recourse to secrecy. . . . [L]ong-term economic growth requires a policy framework that encourages the creation and commercialization of new technologies, as contrasted with a policy that facilitates appropriation of the creative product, lest the creative product dry up in the face of too-easy appropriation.⁸⁰

The fact is that most of the voluminous scholarship on the relationship between market structure and the rate of innovation has been largely ignored in the patent case law.⁸¹ This is in sharp contrast to the antitrust case law, which has been heavily preoccupied with the relationship between market structure and the likelihood of anticompetitive acts. However, Justice Breyer may have suggested a new course for patent law in the Supreme Court's recent *Prometheus* decision. He observed that "patent law's general rules must govern inventive activity in many different fields of human endeavor, with the result that the practical effects of rules that reflect a general effort to balance these considerations may differ from one field to another."⁸² If that is the case, it could signal an important and welcome development based largely on judge-made, or "common law," considerations of market diversity, just as these judgments are made in antitrust law.

I am more enthusiastic than Lemley and McKenna are about the proposition that we should require copying as a prerequisite to patent infringement.⁸³ Congress is unlikely ever to legislate such a reform, so the issue is only of academic importance. The problem of innocent infringers results from several factors. One is a system that permits ambiguous and broadly drafted claims that serve to obfuscate what the patentee actually had in his or her possession—a problem that is particularly acute in information technologies.⁸⁴ Another is the state of the law of anticipation and nonobviousness, which, notwithstanding the

years. See JOSEPH A. SCHUMPETER, *CAPITALISM, SOCIALISM, AND DEMOCRACY* (3d ed. 1950); Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609–26 (1962).

80. *Festo*, 234 F.3d at 639–40 (citing, inter alia, SCHUMPETER, *supra* note 79, ARROW, *supra* note 79, and Edmund W. Kitch, *The Nature and Function of the Patent System*, 20 J.L. & ECON. 265 (1977)); see also *Hilton Davis Chem. Co. v. Warner-Jenkinson Co.*, 62 F.3d 1512, 1529–36 (Fed. Cir. 1995) (Newman, J., concurring) (expressing similar views about the doctrine of equivalents), *rev'd*, 520 U.S. 15 (1997).

81. One pair of authors assert that more has been written on the relationship between market structure and innovation than any other area in the field of industrial organization. See Wesley M. Cohen & Richard C. Levin, *Empirical Studies of Innovation and Market Structure*, in 2 *HANDBOOK OF INDUSTRIAL ORGANIZATION* 1059, 1060 (Richard Schmalensee & Robert D. Willig eds., 1989).

82. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1305 (2012) (citing BOHANNAN & HOVENKAMP, *supra* note 32, at 98–100).

83. See Lemley & McKenna, *supra* note 3, at 2069–72.

84. See JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK* 46–72 (2008).

Supreme Court's efforts to tighten it up in *KSR*,⁸⁵ continues to permit too many obvious patents. When something is obvious a great many other people will discover it on their own and patenting such inventions serves to restrain rather than promote innovation. A third problem is late-claiming, or continuations, which permit patentees to write subsequent claims on previously filed applications.⁸⁶

One coherent way to address all of these problems is to make knowledge of another's relevant patent a prerequisite for infringement, and measure knowledge by an objective test that considers the availability of reasonable and timely notice. A reasonable and prudent person in this context is one who should have known about another's patent(s) and that the accused technology was covered by their patent claims. Late claims would be enforceable only from the date that they were made of record and publicized. Such a change would radically alter the incentives of patentees. They would have every incentive to provide prompt notice rather than disguise their rights. We would likely see the emergence of private "Orange Books" for patents in a variety of technologies.⁸⁷ In all events, we can assume that patent markets would adjust themselves to the new environment.

The real property system has developed its highly successful notice system based on two simple propositions: first, providing notice is much cheaper than searching. Second, the less clear property interests are visible from an inspection of the property itself, the stronger the obligation to provide notice through the recording system. The result is to reverse completely the psychology of notice in real property. For example, we do not have "real property trolls" surreptitiously placing nondevelopment covenants on land awaiting some unsuspecting developer. The penalty for not providing adequate notice that a reasonable person would discover, and in the correct chain of title, is that the covenant becomes unenforceable.⁸⁸

III. POST-ACQUISITION IP PRACTICES THREATENING COMPETITION OR INNOVATION

Many postissuance practices involving IP rights do require an assessment of market power and not merely the identification of rivals. Most of these practices are best addressed under the antitrust laws or, in some cases, misuse doctrine.

85. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415–28 (2007).

86. See Mark A. Lemley & Kimberly A. Moore, *Ending Abuse of Patent Continuations*, 84 B.U. L. REV. 63, 71–83 (2004) (highlighting the problems of continuations).

87. See, e.g., *Merck & Co., Inc. v. Hi-Tech Pharmacal Co.*, 482 F.3d 1317, 1319 (Fed. Cir. 2007) (discussing the "Orange Book," a publication by the FDA that "provides notice of patents covering name brand drugs").

88. See BOHANNAN & HOVENKAMP, *supra* note 32, at 393–94. For additional thoughtful discussion of the issue, noting the definitional problems in identifying truly independent discoveries, see John M. Golden, *Principles for Patent Remedies*, 88 TEX. L. REV. 505, 586–90 (2010).

A. POWER AND CONDUCT

In antitrust law the assessment of power is frequently related to a specific type of conduct, and some types require more power than others. Further, sometimes the requisite power can be inferred from the conduct itself.⁸⁹ For example, Lemley and McKenna fret about the extent of competition between pioneer and generic drugs and observe several situations in which consumer preferences for brands are significantly stronger than preferences for generics.⁹⁰ Does this mean that the two are in separate markets? The answer is that it really does not matter if we are facing a situation in which a pioneer firm has paid a great deal of money to keep the generic out of its market.⁹¹ Firms do not make such payments in order to keep out complementary or unrelated products that have no impact on the demand for the product. For example, if Chrysler does not make washing machines itself and has no plans to do so, it would not be willing to pay much to GM in order to keep GM out of the washing machine market. The large payment from the pioneer to the generic is all the “market” evidence we need that the two products compete,⁹² although there may still be questions about patent validity and the scope of patent grants. In short, the high payment itself provides us with what we need to know about the “power” aspect of this question.

B. PRICE DISCRIMINATION

Price discrimination, which Lemley and McKenna discuss as presenting problems in market definition,⁹³ is strictly a postissuance practice that almost always involves licensing restrictions or the computation of royalty rates. Technically, price discrimination occurs when a seller obtains different rates of return from two or more sales. As this definition indicates, price discrimination is not simply the charging of two different prices, and it often occurs when nominal prices are the same. The most commonly cited example in IP law is the variable-proportion tying arrangement in which the seller cuts the price of a tying product and increases the price of tied products. As a result the seller earns a higher rate of return from high-intensity users.⁹⁴

89. See 2B AREEDA, HOVENKAMP & SOLOW, *supra* note 2, at ¶ 520a (observing that some conduct is irrational except on the premise that the actor(s) has significant market power).

90. See Lemley & McKenna, *supra* note 3, at 2098–2100.

91. See, e.g., C. Scott Hemphill, *An Aggregate Approach to Antitrust: Using New Data and Rulemaking to Preserve Drug Competition*, 109 COLUM. L. REV. 629 (2009); Herbert Hovenkamp, Mark Janis & Mark A. Lemley, *Anticompetitive Settlement of Intellectual Property Disputes*, 87 MINN. L. REV. 1719 (2003).

92. This assumes that the large payment is not for some other purpose, such as avoiding litigation costs. In that case, the payment might be rational no matter the market relationship between the parties' products.

93. See Lemley & McKenna, *supra* note 3, at 2090.

94. See Erik Hovenkamp & Herbert Hovenkamp, *Tying Arrangements and Antitrust Harm*, 52 ARIZ. L. REV. 925, 944 (2010).

Intellectual property rights can facilitate both second- and third-degree price discrimination. In second-degree price discrimination, the seller offers a price schedule and buyers select how much they pay in the process of selecting how much to buy. Quantity discounts are one example; variable proportion tying arrangements are another. In third-degree price discrimination, a seller distinguishes two or more groups of customers in advance and charges them different prices. IP often facilitates such discrimination because licensing restrictions serve to restrict “arbitrage,” which occurs when one set of customers can resell to another set. Well-known examples are the Supreme Court’s *General Talking Pictures* patent decision⁹⁵ and the *ProCD* copyright decision in the Seventh Circuit.⁹⁶ Both involved and approved licensing restrictions that charged different prices to commercial and noncommercial users.

Today most price discrimination is not an antitrust problem. It generally produces positive, or at least ambiguous, welfare results and typically does not exclude anyone. Further, it does not generally reduce incentives to innovate but rather increases them. As a result, price discrimination typically should not be an IP problem either. Indeed, second-degree price discrimination is inherent in most IP licensing arrangements, which measure royalties by the number of times an IP-protected good or process is used or the number of units that are created. All of these cases involve returns to the patentee that vary with the licensee’s use but not with the licensor’s costs. In all events, however, price discrimination creates no inferences whatsoever of competitive harm in the absence of a finding of market power in the antitrust sense, which requires a showing that the defendant could profitably raise price by reducing market-wide output.

C. POSTSALE RESTRAINTS AND EXHAUSTION

Restraints covered by the first sale (“exhaustion”) rule are postissuance practices that may sometimes harm competition or restrain innovation. Otherwise they are probably competitively harmless. The current “per se” rule, applied under the rubric of patent exhaustion in the Supreme Court’s *Quanta* decision, makes market delineation or inquiries into market power irrelevant.⁹⁷ Once a patented article has been sold, further restraints on that article are unenforceable without query into power or anticompetitive effects.⁹⁸ Of course, one can avoid the doctrine altogether by using a license agreement rather than a sale, but enforcement of licensing agreements is limited by requirements of

95. *Gen. Talking Pictures Corp. v. W. Elec. Co.*, 305 U.S. 124 (1938) (manufacturing licenses subject to field-of-use restrictions and segregating products intended for commercial theater use from those intended for home use).

96. *ProCD, Inc. v. Zeidenberg*, 86 F.3d 1447 (7th Cir. 1996) (software differentially priced to commercial and noncommercial users); see also BOHANNAN & HOVENKAMP, *supra* note 32, at 22–23 (discussing examples of third-degree price discrimination).

97. See *Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617, 638 (2008).

98. *Id.* at 625–27.

privity of contract and must be enforced under breach of contract rather than IP rules.⁹⁹ Significantly, antitrust law and misuse doctrine apply to all of these restraints without regard to whether the underlying transaction was a sale or a license agreement.¹⁰⁰ Further, antitrust and misuse doctrine can examine the substance of the restrictions themselves to see if any useful social purpose is served by refusing to enforce them—something that the first sale doctrine’s categorical approach precludes.¹⁰¹ In determining whether a particular postsale restraint is competitively harmful, market delineation or some alternative measure of market power is necessary.

Thus, I am less excited than Lemley and McKenna about the perpetuation of the first-sale doctrine.¹⁰² In its current form, the doctrine is far too draconian—a ham-handed attempt to provide IP-law constraints that would be much better evaluated under the law of antitrust or misuse. Historically, the majority of first-sale cases involved practices that were also addressed under antitrust or misuse law. Indeed, vertical territorial restraints were addressed under the first-sale doctrine even before the antitrust laws were passed,¹⁰³ and the Supreme Court created its harsh rule against resale price maintenance in a first-sale case three years before it applied the same rule in an antitrust case.¹⁰⁴ The same thing applies to tying arrangements, which migrated from first-sale law to misuse and later to antitrust law.¹⁰⁵ Throughout the twentieth century, first-sale cases in the Supreme Court tracked a regime of hostility against resale price maintenance and territorial restraints that the Supreme Court was also expressing under antitrust laws. In that sense *Quanta* seems quaint and out of step, restating a per se rule even though the antitrust rules governing similar conduct have been abandoned.

99. *E.g.*, *Bobbs-Merrill Co. v. Straus*, 210 U.S. 339, 350 (1908) (copyright first-sale doctrine); *see also* Herbert Hovenkamp, *Post-Sale Restraints and Competitive Harm: The First Sale Doctrine in Perspective*, 66 N.Y.U. ANN. SURV. AM. L. 487, 519–20 (2011).

100. *See, e.g.*, 15 U.S.C. § 14 (2006) (applying tying and exclusive dealing prohibitions to all contractual conditions and to goods “whether patented or unpatented”).

101. *See* BOHANNAN & HOVENKAMP, *supra* note 32, at 373.

102. *See* Lemley & McKenna, *supra* note 3.

103. *E.g.*, *Adams v. Burke*, 84 U.S. (17 Wall.) 453, 456–57 (1873) (using first-sale doctrine to refuse to enforce vertical territorial restraint on resale of patented coffin lid).

104. *Dr. Miles Med. Co. v. John D. Park & Sons Co.*, 220 U.S. 373, 384–85 (1911) (subjecting resale price maintenance to per se illegality under Sherman Act), *overruled by* *Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877, 907 (2007) (placing resale price maintenance under rule of reason); *see also Bobbs-Merrill*, 210 U.S. at 350–51 (applying copyright first-sale doctrine and refusing to enforce resale price maintenance clause).

105. *See* in chronological order: *Heaton-Peninsular Button-Fastener Co. v. Eureka Specialty Co.*, 77 F. 288 (6th Cir. 1896) (variable proportion tie; first-sale doctrine); *Henry v. A. B. Dick Co.*, 224 U.S. 1 (1912) (variable proportion tie; first-sale doctrine); *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502 (1917) (same; first-sale doctrine and misuse); *Carbice Corp. of Am. v. Am. Patents Dev. Corp.*, 283 U.S. 27 (1931) (same; misuse); and *Int’l Salt Co. v. United States*, 332 U.S. 392 (1947) (same; antitrust), *abrogated by* *Ill. Tool Works Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 42–43 (2006); *see also* BOHANNAN & HOVENKAMP, *supra* note 32, at chs. 2, 10 & 11.

The position that Lemley and McKenna urge is the same as that taken by the United States government. In cases one year apart, the Solicitor General urged the Supreme Court to abandon the antitrust per se rule against resale price maintenance but also to reject Federal Circuit precedent and adhere to a per se rule against postsale patent restraints.¹⁰⁶

The real difference between postsale restraints and contractual licensing restrictions is that the latter require privity of contract. A privity requirement certainly limits a form of “power” in the sense that the rights cannot be enforced against successors and assigns who have not dealt directly with the rights holder. But real problems arise only in extreme cases, and then misuse or anti-trust policy can help out. Historically, every restriction imposed as a postsale condition on a patented or copyrighted product could have been evaluated under either antitrust or misuse doctrine.

Once again, the law of real property recognizes covenants that “run with the land,” which means that they do not have to be contracted and recontracted every time that land is transferred. The result has undoubtedly been to stabilize land markets such as residential subdivisions but hardly to create monopoly. Once a covenant is found to “run with the land,” it can be enforced against subsequent and even remote purchasers without regard to privity of contract between the plaintiff and the defendant.¹⁰⁷

D. POOLS, STANDARD SETTING, AND OTHER COLLABORATIVE LICENSING

Lemley and McKenna do not discuss the role of market definition in IP cases involving pooling, standard setting, cross licensing, or other forms of IP distribution that involves collaboration among rivals. This is one area where market analysis can be extremely useful—at least as useful as it is in cases involving tying or postsale restraints. Most of the litigated cases involving pooling or other forms of collaborative licensing are concerned with the threat of collusion.¹⁰⁸ Most of the literature defending pooling relates to transaction cost savings, product complementarities, or the need for interconnection or compatibility across a single technology sold by multiple sellers.¹⁰⁹ With Christina

106. See Brief for the United States as Amicus Curiae Supporting Petitioners, *Quanta Computer, Inc. v. LG Elecs., Inc.*, 553 U.S. 617 (2007) (No. 06–937), 2007 WL 3353102, at *18–26 (advocating harsh per se rule against postsale restraints under patent exhaustion rule); Brief for the United States as Amicus Curiae Supporting Petitioner, *Leegin*, 551 U.S. 877 (No. 06–480), 2007 WL 173650, at *6–29 (advocating lifting of per se rule against resale price maintenance).

107. See Molly Shaffer Van Houweling, *The New Servitudes*, 96 GEO. L.J. 885, 893–95 (2008); Hovenkamp, *supra* note 99, at 518–19.

108. See 12 HERBERT HOVENKAMP, *ANTITRUST LAW* ¶¶ 2041–46 (3d ed. 2012) (forthcoming) (on file with the author).

109. E.g., Richard J. Gilbert, *Antitrust for Patent Pools: A Century of Policy Evolution*, 2004 STAN. TECH. L. REV. 3; see also Herbert Hovenkamp, *Competition for Innovation*, COLUM. BUS. L. REV. (forthcoming 2012) (manuscript at 17), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2008953 (noting significance of query whether patents in pool function as complements or substitutes).

Bohannon, I have argued that an important motivation for collaborative licensing in many situations, particularly in information technologies, is boundary ambiguity.¹¹⁰ This is a fairly straightforward problem of commons management. When the cost of defending individual boundaries rises higher than the costs of commons management, producers prefer commons organization.¹¹¹ The problem of boundary ambiguity in patent law is pervasive; if patent boundaries were clearer and more reasonably communicated to others, there would be far less need for massive licensing and cross-licensing that often involves thousands of patents. Given the situation that we have, however, this is a problem of determining when antitrust or perhaps misuse law should intervene. Given the many justifications for collaboration coupled with the threat of collusion or innovation restraint, this is prime territory for rule of reason analysis, which, in turn, requires market definition.

CONCLUSION

Market structure and power are most likely to be relevant to IP when a lawsuit is analyzed under the antitrust laws rather than IP law. For example, antitrust's *Walker Process* doctrine refuses to condemn fraudulent patent infringement suits unless the structural preconditions for monopoly have been met, which include a dominant share of a properly defined relevant market.¹¹² The same thing is true of patent pools and standard setting addressed under antitrust's rule of reason.¹¹³ Patent ties are not unlawful unless the patentee holds power in the patented tying product, and this requires a market definition and computation of a market share in that market.¹¹⁴ Indeed, the only Patent Act provision that makes market power relevant is the Patent Misuse Reform Act, which declares that patent ties will not constitute misuse unless the patentee has market power in the tying product.¹¹⁵

To be sure, one of the most studied issues in the industrial organization literature is the relationship between market structure and innovation.¹¹⁶ One would never know it, however, from reading federal court intellectual property

110. BOHANNAN & HOVENKAMP, *supra* note 32, at 332, 337–38, 347–48.

111. *See* BOHANNAN & HOVENKAMP, *supra* note 32, at ch. 12 (drawing from ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 61–65 (1990) and Ronald H. Coase, *The Nature of the Firm*, 4 *ECONOMICA*, NEW SERIES 386 (1937)).

112. *Walker Process Equip., Inc. v. Food Mach. & Chem. Corp.*, 382 U.S. 172, 176–78 (1965).

113. *See* BOHANNAN & HOVENKAMP, *supra* note 32, at 353–63.

114. *Ill. Tool Works, Inc. v. Indep. Ink, Inc.*, 547 U.S. 28, 46 (2006).

115. 35 U.S.C. § 271(d)(5) (2006), *amended by* Leahy-Smith America Invents Act, Pub. L. No. 112-29, § 5(b), 125 Stat. 284, 299 (2012) (“No patent owner . . . shall be . . . deemed guilty of misuse or illegal extension of the patent right by reason of his having . . . conditioned the license of any rights to the patent or the sale of the patented product on the acquisition of a license to rights in another patent or purchase of a separate product, unless, in view of the circumstances, the patent owner has market power in the relevant market for the patent or patented product on which the license or sale is conditioned.”).

116. *See supra* notes 80–81 and accompanying text.

decisions. Market structure and market power in particular have never been particularly important in IP cases.

The antitrust statutes are not a great deal more explicit than the IP laws are about market structure. They never speak of market power or a relevant market, although the merger provision uses the term “line of commerce,” which the courts have sometimes equated with a relevant product market.¹¹⁷ The Sherman Act speaks only of practices that “restrain trade”¹¹⁸ or that “monopolize”¹¹⁹ but does not mention markets. The law of relevant markets in antitrust is entirely judge-made, much of it originating in Judge Hand’s important decision in the *Alcoa* aluminum monopolization case.¹²⁰

Should IP law follow the lead given by antitrust and develop rules relating IP law more specifically to market structure? Justice Breyer’s statement in *Prometheus* that patent rules may have to be applied differently in different markets gives at least a little reason for thinking so.¹²¹ Historically, resistance to diversity of application in IP law results from the IP statutes being much more detailed than the antitrust laws and thus leaving much less room for judicially initiated structural analysis. Second, and relatedly, the most important issues have been statutorily preempted. For example, it might be wise to give patents or copyrights a durational term or differential scope that varies with the industry,¹²² but the statutory language seems to preclude this. Finally, and most importantly, IP law has never produced a sufficiently robust consensus about the relationship between market structure and optimal IP protection. These facts have historically served to keep serious market power inquiries off the table.

117. 15 U.S.C. § 18 (2006) (condemning mergers in “any line of commerce” and in “any section of the country”).

118. *Id.* at § 1.

119. *Id.* at § 2.

120. *See* *United States v. Aluminum Co. of Am.*, 148 F.2d 416 (2d Cir. 1945).

121. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1305 (2012) (observing that patent rules may have to be applied differently in different fields); *see also supra* note 82 and accompanying text.

122. *See* DAN L. BURK & MARK A. LEMLEY, *THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT* 137 (2009).