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978-0-521-76674-6 - Competition Policy and Patent Law under Uncertainty: Regulating Innovation

Edited by Geoffrey A. Manne and Joshua D. Wright

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Introduction

Innovation is critical to economic growth. While it is well understood that legal institutions play an important role in fostering an environment conducive to innovation and its commercialization, much less is known about the optimal design of specific institutions. Regulatory design decisions, and in particular competition policy and intellectual property regimes, can have profoundly positive or negative consequences for economic growth and welfare. However, the ratio of what is known to what is unknown with respect to the relationship between innovation, competition, and regulatory policy is staggeringly low. In addition to this uncertainty concerning the relationships between regulation, innovation, and economic growth, the process of innovation itself is not well understood.

The regulation of innovation and the optimal design of legal institutions in this environment of uncertainty are two of the most important policy challenges of the twenty-first century. The chapters in this book approach this critical set of problems from an economic perspective, relying on the tools of microeconomics, quantitative analysis, and comparative institutional analysis to explore and begin to provide answers to the myriad of challenges facing policy-makers. Any legal regime, after all, must attempt to assess the trade-offs associated with rules that will affect incentives to take risks, allocative efficiency, competition, and freedom of economic actors to commercialize the fruits of their innovative labors and foster economic growth.

The strength of this analysis – often described as the New Institutional Economic approach – is in its recognition that understanding economic performance requires not only economic modeling of narrow behavior, but also an understanding of that behavior in its legal, economic, social, and political institutional contexts. New Institutional Economics employs the tools of

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economics to rigorously analyze these institutions and relationships.¹ In the context of innovation, the New Institutional Economics approach requires rigorous thought about questions of institutional design and its potential impact on technological change. As Joskow notes, technological change has always been understood as an important component of economic growth,² but

the theoretical and empirical foundation for understanding the rate and direction of innovation and how they are influenced by microeconomic, macroeconomic, institutional and policy considerations was poorly understood. Economic growth was driven by changes in capital and labor inputs, exogenous technological change, and poorly understood differences between countries over time and space.

In the tradition of Coase, North, Williamson, Klein, Alchian, Demsetz, and other key contributors to the development of the New Institutional Economic approach, the chapters in this volume apply economic insights to the challenging questions associated with regulating innovation, contributing a more rigorous theoretical and empirical understanding to the policy debate of how particular legal institutions are likely to impact innovation and growth. The application of this robust framework to the economics of innovation suggests several fruitful paths for scholarly inquiry that are explored throughout the book, including, at least, the economics of innovation, the relationship between innovation and competition policy, the patent system itself, the nature of property rights and theoretical perspectives on patent law, and the appropriate antitrust regulation of standard-setting organizations. However, each of these issues is related to the much broader and unifying theme of regulating competition in a dynamic and innovative market setting.

We have entitled our book *Competition Policy and Patent Law under Uncertainty: Regulating Innovation* because we believe any coherent regulatory framework must take into account the low level of empirical knowledge surrounding the complex relationship between regulation – through both competition policy and patent law – and innovation, and the corresponding uncertainty caused by this absence of knowledge. The relationship between regulation and innovation has posed a significant challenge to antitrust economists at least since Joseph Schumpeter's,³ suggestion that dynamic

¹ Joskow, P. "Regulation of Natural Monopoly." In *Handbook of law and economics*. Amsterdam: Elsevier, 2007.

² *Id.*

³ Schumpeter, Joseph Alois. *Capitalism, socialism, and democracy*. 3d ed. New York: Harper, 1950.

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competition would result in “creative destruction,” leading to a competitive process where one monopolist would replace another sequentially as new entrants developed a superior product.

Schumpeter’s argument is often relied on in support of the proposition that antitrust enforcers should be reluctant to intervene in product markets because short-run welfare gains are likely to be swamped by a reduction in dynamic efficiencies associated with less innovation. The Schumpeterian argument naturally has limits, and it need not be the case that all welfare trade-offs between static product market competition and dynamic efficiencies everywhere tilt in favor of the latter. The central, elusive issue at the heart of the patent system, however, is the trade-off between the *ex ante* incentive to create and the *ex post*, dynamic consequences of patent policy that may impede sequential innovation to incentivize a priori creation.⁴ Unsettled is the question of the magnitude of this trade-off and the long-run economic consequences of specific elements of the patent system aimed at promoting development on either side of this trade-off.

In the domain of competition, the well-known and oft-discussed tensions between monopoly, innovation, and product market competition have generated a substantial body of literature concerning the appropriate role of antitrust enforcement in the regulation of innovation.^{5,6,7} This debate has prompted numerous proposals from commentators seeking to identify the most desirable approach to incorporating innovation into antitrust analysis, including the development of the “innovation market” concept,⁸ or a more precise and rigorous approach to accounting for the likely costs and benefits of innovation in merger analysis.⁹ Federal agency officials, particularly at the Department of Justice, have also recently demonstrated a concern for antitrust policy that overreaches by attempting to increase short-run

⁴ Scotchmer, Suzanne. *Innovation and incentives*. Cambridge, Mass.: MIT Press, 2004.

⁵ Baker, J. *Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation*, 74 ANTITRUST L.J. 575 (2007).

⁶ Gilbert, Richard. “Holding Innovation to Antitrust Standard.” *Competition Policy International* 3, no. 1 (2007).

⁷ Evans, David and Keith Hylton. “The Lawful Acquisition and Exercise of Monopoly Powers and the Implications for the Objectives of Antitrust.” *Competition Policy International* 4, no. 2 (2008).

⁸ Gilbert, Richard and Steven Sunshine. “Incorporating Dynamic Efficiency Concerns in Merger Analysis: The use of Innovation Markets.” *Antitrust Law Journal* 63 (1995).

⁹ Katz, Michael and Howard Shelanski. “Merger Policy and Innovation: Must Enforcement Change to Account for Technological Change.” In *Innovation Policy and the Economy* Volume 6. Cambridge: MIT Press, 2006.

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product market competition at the expense of dynamic efficiencies created by innovation.^{10,11}

Taken collectively, the above are a welcome departure from a regime that myopically presumed a static market analysis would generate desirable outcomes, especially when that analysis is undertaken without sufficient sensitivity to the institutional settings in which enforcement occurs costlessly and omniscient enforcers act on the basis of perfect economic models and full information. Until Easterbrook's seminal insights about the relationship between the social costs of erroneous antitrust enforcement and optimal liability rules, the long-term economic consequences of imperfect intervention (or non-intervention, for that matter) had been an oft-ignored but fundamental aspect of proper competition policy.¹² The more recent recognition of the importance and difficulty of dynamic economic analysis is part and parcel of this trend. Both reflect the influence of New Institutional Economics.

These ongoing policy discussions are even more acute in the debate over whether reform of the antitrust laws is required to make them coherent in a "new economy" in which innovation, intellectual property, and technological change are essential components of the competitive process.¹³ The emerging consensus appears to be that economic analysis and learning are a sufficient basis to conclude that antitrust *should* incorporate dynamic efficiencies into the current framework by accounting for the impact of competition to engage in research and development for new or improved goods, services, or processes. For example, the Antitrust Modernization Committee Report and Recommendations optimally declares:¹⁴

[C]urrent antitrust analysis has a sufficient grounding in economics and is sufficiently flexible to reach appropriate conclusions in matters involving industries in which innovation, intellectual property, and technological change are central features.

¹⁰ Masoudi, Gerald F. Deputy Assistant Attorney General, Antitrust Division, Intellectual Property and Competition: Four Principles for Encouraging Innovation (April 11, 2006), available at <http://www.usdoj.gov/atr/public/speeches/215645.htm>.

¹¹ Barnett, T., Assistant Attorney General, Antitrust Division, The Gales of Creative Destruction: The Need for Clear and Objective Standards in Enforcing Section 2 of the Sherman Act (June 20, 2006), available at <http://www.ftc.gov/os/sectiontwohearings/docs/Barnett-statement.pdf>.

¹² Easterbrook, Frank. "The Limits of Antitrust." *Texas Law Review* 63, no. 1 (1984).

¹³ Posner, Richard. "Antitrust and the New Economy." *Antitrust Law Journal* 68 (2001).

¹⁴ Antitrust Modernization Commission Report and Recommendations, 2007, *found at* http://govinfo.library.unt.edu/amc/report_recommendation/toc.htm.

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Slowly, the center of the policy debate appears to have shifted from whether regulatory efforts should account for the relationships between competition, property rights, innovation, and economic welfare to how regulators should incorporate theoretical and empirical knowledge of these relationships into sensible policy. These developments have the potential to improve antitrust analysis and benefit consumers. Regulatory regimes ignoring dynamic competition and efficiencies are as unlikely to improve welfare as those that are so paralyzed by fear of deterring innovation that they fail to make appropriate interventions in product markets where consumers are threatened by anticompetitive conduct.

In patent policy the debate is no less acute, although there may be a better appreciation for the limits of both our knowledge and our regulatory institutions. There is a strong, recent push in the courts, in the commentary, and in Congress to limit the extent of the property rights protected by patents. In the courts, a string of recent decisions culminating in the Federal Circuit's 2008 *Bilski* decision has weakened the scope and strength of patent protection, particularly for the sorts of algorithmic innovations at the heart of the "new economy." Commentators have similarly mounted a scathing campaign against the present U.S. patent system. While some of this has been essentially ideological, "antiproperty" rhetoric,¹⁵ more recent economic analysis has been built on far stronger foundations.¹⁶ Along the same lines, the push for patent reform in Congress has reached a frenzied pitch, with passage of some sort of legislation almost inevitable in the coming years.

Much of the economic literature on the patent system is inherently built on an institutional foundation where elements of the patent-granting and enforcement systems are subjected to close scrutiny. Nevertheless, there remains a dearth of rigorous economic literature seriously addressing the role of property rights and institutions in facilitating competition, innovation, and economic growth. Certainly work remains to be done to rigorously incorporate the potential impact of antitrust and patent law on innovation and dynamic efficiency. The fundamental challenge is identifying a sound analytical framework to guide policy-makers, courts, and agencies in designing policies that achieve the desired goals of encouraging innovation and growth while satisfying the constraint that the social gains obtained through intervention still outweigh the sum of administrative and error costs.

¹⁵ Stallman, Richard. *Free software, free society: selected essays of Richard M. Stallman*. Boston, MA: Free Software Foundation, 2002.

¹⁶ Bessen, James, and Michael James Meurer. *Patent failure: How judges, bureaucrats, and lawyers put innovators at risk*. Princeton: Princeton University Press, 2008.

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Meeting the demands of this challenge is easier said than done. Our economic knowledge regarding innovation itself, conduct affecting innovation, and how economists and regulators should assess competitive outcomes involving trade-offs between product market competition and innovation is far less impressive than our knowledge in a purely static setting. The error-cost approach to antitrust policy¹⁷ teaches that regulators' decision-making process must be informed by the relatively high costs of false positives that lead to a chilling of pro-competitive innovation. The error-cost framework has been applied fruitfully to resolve debates over the optimal antitrust liability rules for predatory pricing, bundling, tying, and other contractual practices.^{18,19,20,21} Over the past several decades, industrial organization economists have collected a small but ever-growing body of empirical evidence concerning the likely competitive effects of various business practices that have attracted antitrust scrutiny, such as vertical contractual restraints.²² This empirical evidence informs both our perceptions of the likelihood that any given practice is pro-competitive and our expected frequency of false positives. Where the conduct at issue involves innovation, the key to economic growth, the social costs associated with false positives are no doubt high. It is therefore critical to assess the state of our economic learning related to antitrust analysis of competitive effects in markets where innovation is an important component of the competitive process. A key policy question is whether existing economic theory and empirical knowledge provide a sufficient basis for identifying those instances of innovation or conduct affecting innovation that will reduce welfare and produce social gains that outweigh administrative and error costs.

While the emerging consensus appears to answer this question in the affirmative, the incorporation of innovation considerations into competition policy and patent law is a more difficult enterprise than has generally been appreciated. Many scholars have recognized that our empirical knowledge of the relationship between market structure and innovation, as well as between market structure and consumer welfare, is limited relative to

¹⁷ Easterbrook 1984, *ibid*.

¹⁸ Cooper, James, Luke Froeb, Dan O'Brien, and Michael Vita. "Vertical Antitrust Policy as a Problem of Inference." *International of Industrial Organization* 23, no. 7–8 (2005).

¹⁹ Evans, David, and A. Jorge Padilla. "Designing Antitrust Rules for Assessing Unilateral Practices: A Neo-Chicago Approach." *University of Chicago Law Review* 72 (2005).

²⁰ Beckner, C. Frederick, and Steven Salop. "Decision Theory and Antitrust Rules." *Antitrust Law Journal* 67, no. 1 (1999).

²¹ Hylton, Keith and Michael Salinger. "Tying Law and Policy: A Decision-Theoretic Approach." *Antitrust Law Journal* 69 (2001).

²² Froeb et al., *ibid*.

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our understanding of static price effects in conventional product markets. The limits of our empirical knowledge are just one important constraint on the ability of regulators to confidently intervene in markets on behalf of consumers.

A second such constraint is the multidimensional nature of competition. “Competition” involves a remarkably heterogeneous set of activities. The competitive process requires various forms of rivalry that occur on multiple dimensions: output, price, quality, and innovation. The key point for would-be regulators, highlighted by Demsetz,²³ among others, is that these forms of competitive rivalry are frequently inversely correlated. The critical point is that the relevant question for competition policy authorities is whether they have a reliable basis on which to determine which mixture of competitive activities, including innovation, will maximize welfare.

The Demsetzian view was that the multiplicity of competitive activities undermined, perhaps completely, the ability of “scholars, lawyers, judges, and politicians” to confidently “agree that a policy has increased (or decreased) the general level of competitive intensity.” Even when there was consensus that a particular rule change or change in the mix of competitive activities was for the better, Demsetz argued that the consensus was likely the product of “our heavy reliance on perfect competition, monopoly, and oligopoly models, all of which focus only on imitative output competition.” While today’s competition and innovation policy communities may not publicly express Demsetz’s skepticism concerning the promise of antitrust rules in improving the mix of competitive activities, the spirit of the underlying skepticism illustrates the heart of the question motivating a significant portion of modern competition policy debates: Is the economic or empirical basis of rules and proposed policies providing incentives to alter the mix of competitive activities sufficient to justify confidence that the policy changes will do more good than harm?

Where these forms of competitive rivalry are negatively correlated, such as static price competition and innovation, evaluating the benefits of these alternative bundles in terms of consumer welfare requires knowing the marginal rates of technical substitution between competitive forms to convert different forms into common units of consumer welfare. What empirical evidence do we have about these rates of substitution? Others²⁴ have documented this extensive literature in greater detail than is required for

²³ Demsetz, Harold. 100 Years of Antitrust: Should We Celebrate?, Brent T. Upson Memorial Lecture, George Mason University School of Law, Law and Economics Center (1991).

²⁴ Gilbert 2007; Baker, 2007, *ibid*.

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our purposes, but we briefly survey the existing theoretical and empirical knowledge of the relationship between product market competition, consumer welfare, innovation, and market structure.

It is useful to begin with an understanding of some well-established economic principles of the relationship between competition and innovation that have emerged from this literature. The first principle is that competitive rivalry associated with innovation is a form of competition itself. In other words, competition encourages innovation by providing an incentive for each competitor to win the “prize” associated with appropriating the gains from the innovation. The second principle is that product market competition encourages competitors to innovate to face less competition and earn greater profits. The converse can also hold: A firm that does not face substantial product market competition might have less incentive to innovate. This effect is at the heart of John Hicks’s observation that the “best of all monopoly profits is a quiet life,” and has been referred to as the “escape-the-competition” effect.²⁵ The third principle is related to the second and posits that firms that face greater product market competition post-innovation will have less incentive to engage in research and development. The fourth principle is often referred to as the “pre-emption effect,” which illustrates that a firm may have an additional marginal incentive to innovate if the innovation will discourage rivals and potential entrants from investing in research and development themselves.

By themselves, these non-mutually exclusive and sometimes conflicting economic principles do not tell us what role competition policy and patent law should play in innovative industries. For example, the maxim that innovation is a form of competition offers little guidance for antitrust policy. All agree that innovative activity is an essential part of the competitive process. The *antitrust-relevant* questions, however, are not whether competition that spurs innovation and consumer benefits should be encouraged or whether attempts to reduce such competition should violate the antitrust laws. Rather, the antitrust-relevant policy question is whether antitrust agencies and judges can confidently predict when antitrust policy might increase or decrease innovative activity in a way that net increases consumer welfare. If firms are engaging in an endogenously determined mixture of competitive activities and an antitrust policy designed to encourage innovation is successfully introduced, we can expect the new mixture of competitive forms to involve more innovation and less of other forms of competition. But it is unclear that the first principle tells us anything more about the

²⁵ Hicks, John. “Annual Survey of Economic Theory: The Theory of Monopoly.” *Econometrica* 3, no. 1 (1935).

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likely consumer welfare effects of the policy. The key policy challenge is to identify the conditions under which antitrust agencies and courts can test a sufficient economic and empirical basis to find out if a specific intervention is going to improve welfare.

The same logic applies, of course, to patent law reform. Competition might be encouraged by the strengthening of property rights, with firms competing for a more-substantial reward; or it might be deterred, where strong rights and inefficient institutions impede future competition and innovation or induce inefficient rent-seeking. Again, regardless, the first principle does little to enable any informed or rigorous analysis of specific policy proposals. The second and third principles do not offer better policy guidance on their own. Leaving aside the methodological issue of how one measures competition in these models, these principles teach that product market competition might increase or decrease the incentive to innovate under different conditions. Finally, the fourth principle, the “pre-emption effect,” teaches that dominant firms might have a greater incentive to innovate to reduce the innovation incentives of rivals and potential entrants. The pre-emption effect applies not only to “sham” innovations but also innovations that offer consumers immediate and tangible benefits such as offering a new product or increasing product quality.

The theoretical literature relating to competition and innovation is by itself insufficient to instill any great confidence in our – or regulators’ – ability to determine what antitrust policies will encourage innovation and result in net consumer welfare gains. Specifically, our ability to apply antitrust standards depends on our ability to predict how a rule will impact the *mixture* of competitive forms that will exist after the policy is implemented and to rank these mixtures on consumer welfare or efficiency criteria. At this point, economic theory does not appear to provide a reliable method of making such a determination. Gilbert notes that “economic theory supports neither the view that market power generally threatens innovation by lowering the return to innovative efforts nor the Schumpeterian view that concentrated markets generally promote innovation.”²⁶

There are several reasons for this uncertainty. First, as discussed previously, our theoretical knowledge cannot yet confidently predict the direction of the impact of additional product market competition on innovation, much less the magnitude. Additionally, the multi-dimensional nature of competition implies that the magnitude of these impacts will be important as innovation and other forms of competition will frequently be inversely correlated as they relate to consumer welfare. Thus, weighing

²⁶ Gilbert, *supra* note 5.

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the magnitudes of opposing effects will be essential to most policy decisions relating to innovation. Again, at this stage, economic theory does not provide a reliable basis for predicting the conditions under which welfare gains associated with greater product market competition resulting from some regulatory intervention will outweigh losses associated with reduced innovation.

But regulators, policy-makers, and judges need not rely only on this theoretical literature alone to guide policy. Rather, one expects policy-makers to turn to our empirical knowledge of the relationship between competition, innovation, and consumer welfare. There are at least three empirical relationships that are relevant to policy-making in this area. The first is the relationship between product market competition and innovative activity, the second is the link between firm size and research and development, and the third is the connection between patent activity and innovation or economic growth.

Unfortunately, here, too, we believe that the available evidence, given the current state of the empirical literature, is an insufficient basis on which to ground policy decisions. Early studies of the link between product market competition and innovation supported the Schumpeterian hypothesis by finding an inverted-U relationship: Innovative activity is at its maximum at intermediate levels of market concentration and decreases as concentration approaches monopoly or more atomistic structures.^{27,28,29} But the failure of these early studies to account for differences between industries, and the endogeneity in the relationship between market structure and innovation, undermine their value. A recent study by Philippe Aghion et al.,³⁰ suggests that the link between market structure and markups of price over average costs might indeed have an inverted-U shape, though commentators have noted that the study does not provide a basis for policy decisions regarding the role of innovation in well-defined markets because the analysis only controls for industry effects at the two-digit SIC code level. Other studies have examined the impact of changes in market structure within a single industry over time to analyze the relationship between product market competition and productivity or innovation with mixed results.³¹ And others³²

²⁷ Baker, J. "Beyond Schumpeter vs. Arrow: How Antitrust Fosters Innovation." 74 Antitrust Law Journal 575 (2007).

²⁸ Katz, M. and Shelanski, H.: "Mergers and Innovation." 74 Antitrust Law Journal 1 (2007).

²⁹ Gilbert, Richard. "Holding Innovation to an Antitrust Standard." 3 Competition Policy International 47 (2007).

³⁰ Aghion, P., *Competition and Innovation: An Inverted U Relationship*, 120 Q.J. ECON. 701 (2005).

³¹ Hylton, Keith and Fei Deng. "Antitrust Around the World: An Empirical Analysis of the Scope of the Competition Laws and Their Effects." Antitrust Law Journal 74, no. 2 (2007).

³² Hylton and Deng, 2007, *ibid*.