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THREE QUASI-FALLACIES IN THE CONVENTIONAL UNDERSTANDING OF INTELLECTUAL PROPERTY

*Jonathan M. Barnett**

In recent years the Supreme Court, Congress, and the White House have taken actions to weaken patent rights. These actions are supported by widely expressed views among legal scholars that cast doubt on the social value of robust intellectual property rights. These views rely on some combination of three core propositions: (i) IP rights raise entry barriers and increase costs to users; (ii) innovation often proceeds without IP rights; and (iii) IP rights usually or often entrench large incumbent firms. As a matter of theory and empirics (including novel evidence based on amicus briefs filed in Supreme Court patent cases during 2008-2015), I show that each of these propositions is unlikely to be true in a significant set of commercially relevant circumstances. First, IP rights can reduce entry barriers and users' costs relative to the organizational and transactional structures that markets would adopt without those rights. Second, environments that support innovation without IP rights typically rely on alternative mechanisms for securing exclusivity at some point on the relevant bundle of products and services, potentially imposing access costs and entry barriers that would not exist under a robust IP regime. Third, with the exception of the pharmaceutical industry, large integrated incumbents in technology markets usually or often oppose expanding IP rights while the opposite is often true of unintegrated, R&D-intensive (and often smaller) firms that have difficulty funding the innovation and commercialization process without IP rights. These revised propositions cast doubt on the IP-skeptical presumptions that tend to dominate scholarly, policy, and popular understandings of IP rights and drive support for legislative and judicial reforms to weaken IP rights.

INTRODUCTION

The popular, business, and political attack on intellectual property ("IP") rights is in full swing. Remarkably, almost every branch of the federal government has supported this policy shift, cutting across traditional partisan lines and encompassing significant segments of the business community. Starting with the landmark 2006 decision in *eBay Inc. v. MercExchange LLC*,¹ the Supreme Court has issued a sequence of decisions that

* Professor, University of Southern California, Gould School of Law. This paper originated in a presentation to the 2012 Annual Conference of the International Society for New Institutional Economics and has been presented in various forms at Harvard Law School, Stanford Law School, and USC

have incrementally weakened the force of patent rights.² Most dramatically, the Court issued decisions in 2012, 2013, and 2014 that cast doubt on the validity of tens of thousands of biotechnological, medical diagnostics, software, and business method patents.³ In 2011, Congress enacted the America Invents Act, which, among other things, made procedural reforms that provide third parties with additional opportunities to contest an issued patent or a patent application.⁴ In 2013, the White House indicated that the 2011 reforms were insufficient.⁵ Currently Congress is considering proposals that would, among other things, provide winning patent infringement defendants with additional tools to recover litigation fees.⁶ Large technology companies such as Google, Cisco, and others—in short, the “Silicon Valley” lobby—mostly support these judicial decisions and legislative actions, as expressed through amicus briefs, policy statements, or, in the case of the now-tabled “Stop Online Piracy Act” (SOPA), mass public protest.⁷

These actions all rest on the general view that the IP system, and patent rights in particular, has been strengthened excessively to the benefit of a small group of opportunistic IP holders and to the detriment of the public at large. Relatedly, these actions often reflect the view that IP rights are not necessary to support a good deal of innovation. These increasingly prevailing views in popular, business, and policy commentary have roots in—and judicial decisions and executive branch reports sometimes cite—arguments put forward by the legal academy (and some economists).⁸ There is a high

School of Law. I am grateful for comments from participants at those venues. Comments are welcome at jbmatt@law.usc.edu. Alina Aghankhani and Quincy Chuck provided exceptional research assistance.

¹ eBay, Inc. v. MercExchange, L.L.C., 547 U.S. 388 (2006) (holding that, even if patent is found valid and infringed, injunctive relief only follows subject to equitable four-factor test).

² Some of these include: Quanta Computer, Inc. v. LG Elecs., Inc., 553 U.S. 617 (2008) (upholding patent exhaustion doctrine); KSR Int'l Co. v. Teleflex, Inc., 550 U.S. 398 (2007) (relaxing standard for finding a patent to be invalid as nonobvious); MedImmune, Inc. v. Genentech, Inc., 549 U.S. 118 (2007) (expanding circumstances under which patent licensee may seek declaratory judgment that the licensed patent is invalid).

³ On biotechnology patents, see Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107 (2013) (denying patentability of certain isolated genetic sequences); on medical diagnostic patents, see Mayo Collaborative Servs. v. Prometheus Labs., Inc., 132 S. Ct. 1289 (2012); on business method patents, see Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014).

⁴ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

⁵ See Casey Newton, *Obama: We're Only Halfway There on Patent Reform*, CNET (Feb. 14, 2013, 2:37 PM), <http://www.cnet.com/news/obama-were-only-halfway-there-on-patent-reform>.

⁶ Innovation Act, H.R. 9, 114th Cong. (2015).

⁷ See Part III.A.1-2.

⁸ For representative views in this vein among legal scholars, see generally JAMES BESSEN & MICHAEL J. MEURER, *PATENT FAILURE* (Princeton U. Press 2008); YOCHAI BENKLER, *THE WEALTH OF NETWORKS* (Yale U. Press 2006); LAWRENCE LESSIG, *FREE CULTURE* (The Penguin Press 2004) [hereinafter LESSIG, *FREE CULTURE*]; LAWRENCE LESSIG, *THE FUTURE OF IDEAS* (Random House 2001) [hereinafter LESSIG, *FUTURE OF IDEAS*]; Diane Leenheer Zimmerman, *Copyrights as Incentives: Did We Just Imagine That?*, 12 THEORETICAL INQUIRIES L. 29 (2011); Madhavi Sunder, *IP*³, 59 STAN. L. REV.

degree of convergence between judicial decisions and the expressed policy preferences of members of the (mostly legal) academy. From January 2008 to January 2015, as shown in the Appendix, the Supreme Court issued nineteen decisions relating to patent law, almost 74% of which weakened patent rights and almost 13% of which strengthened or maintained those rights.⁹ Out of the decisions that weakened patents, all but two were unanimous.¹⁰ These results approximately match the views expressed by members of the academy (mostly law professors) in amicus briefs filed in those cases: 74% of the briefs favored the alleged infringer while 17% favored the patent holder (or applicant).¹¹

Generally speaking, this IP-skeptical school of thought explicitly endorses, or implicitly rests on, some or all of the following three propositions. These propositions—some of which are of long-standing vintage in IP scholarship and jurisprudence—together cast doubt on the social value of IP rights and therefore tend to support reducing the force of those rights.

Proposition I: IP rights increase costs to users¹² and raise entry barriers to competitors.

Proposition II: There is significant innovation without IP.

Proposition III: IP rights tend to promote the interests of large incumbent firms.

In this Essay, I show that each proposition has a substantially limited scope of application as a theoretical matter and, based on evidence drawn from a wide variety of markets, as an empirical matter.¹³ I call these propo-

257 (2006); James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 L. & CONTEMP. PROBS. 33 (2003); and among economists, see generally ADAM B. JAFFE & JOSH LERNER, *INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING PROGRESS, AND WHAT TO DO ABOUT IT* (Princeton Univ. Press 2007); MICHELE BOLDRIN & DAVID K. LEVINE, *AGAINST INTELLECTUAL MONOPOLY* (Cambridge Univ. Press 2008).

⁹ The remaining three decisions had no clear adverse or positive effects, from the perspective of a patent holder. See *infra* App.

¹⁰ The remaining decisions were decided on an 8-1 and 5-3 basis. See *infra* App.

¹¹ The remaining 9% of amicus briefs did not favor either party. For further description of this data, see *infra* Part III.A.2.

¹² Unless otherwise specified, “user” refers to both end-users and intermediate users (the latter term referring to entities that use intangible goods as inputs for purposes of production or subsequent innovation).

¹³ This Essay consolidates and refines analyses I have presented separately that relate to each of these propositions. With respect to Proposition I, see generally Jonathan M. Barnett, *Intellectual Property as a Law of Organization*, 84 S. CAL. L. REV. 785 (2011) [hereinafter Barnett, *Law of Organization*] and Jonathan M. Barnett, *Is Intellectual Property Trivial?*, 157 U. PA. L. REV. 1691 (2009); with

sitions “quasi-fallacies” because, in a commercially significant set of circumstances, they overestimate the adverse effects, and underestimate the positive effects, of strong IP protection. Conversely, they underestimate the adverse effects, and overestimate the positive effects, of weak or zero IP protection. In the aggregate, these propositions support what appear to be prevailing views in legal scholarship—and by extension, judicial opinions, policy commentary, and political rhetoric—that cast doubt on the social value of IP rights or some robust version of those rights. To the extent that academic “scribblers”—to use Keynes’ famous term¹⁴—influence actual policy actions, it is important that we rigorously evaluate these underlying propositions for theoretical and empirical coherence.

Proposition I represents the fundamental source of error. It is intuitive to think—and standard textbook analysis of IP typically states—that reducing IP rights reduces users’ costs of accessing intellectual assets and lowers entry barriers for competitors. I show that the opposite is often likely to be true. Reducing IP rights can increase users’ access costs and heighten entry barriers, while increasing IP rights can decrease access costs and lower entry barriers. These counterintuitive effects derive from a simple analytical principle: the effect of reducing IP rights cannot be predicted without anticipating the market response to the state’s action. Subject to budget constraints, firms will react to any withdrawal of IP rights by adopting the next best set of business strategies and technological tools to assert exclusivity and support the supra-competitive pricing required to fund investments in innovation and commercialization. That weak-IP world may exhibit higher access costs and entry barriers relative to a strong-IP world. More specifically, weakening IP rights will sometimes compel firms to commercialize innovations through bundled production and distribution structures that necessitate increased capital investment, as compared to a market in which IP rights enable firms to extract value through unbundled structures. The potential result is a suboptimal world in which commercialization costs increase, entry opportunities decline, industry concentration increases, firm and market structures are distorted, and ultimately, end-users may suffer some combination of increased prices and a reduced or distorted flow of innovations.

Propositions II and III largely stand and fall with Proposition I.

respect to Proposition II, *see generally* Jonathan M. Barnett, *The Illusion of the Commons*, 25 BERKELEY TECH. L. J. 1751 (2010) [hereinafter Barnett, *Illusion of Commons*]; with respect to Proposition III, *see generally* Jonathan M. Barnett, *Property as Process: How Innovation Markets Select Innovation Regimes*, 119 YALE L. J. 384 (2009) [hereinafter Barnett, *Property as Process*] and Jonathan M. Barnett, *What’s So Bad About Stealing?*, 4 J. TORT L. 1 (2011).

¹⁴ I am referring to John Maynard Keynes’ much-quoted statement: “Practical men, who believe themselves to be quite exempt from any intellectual influence, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler of a few years back.” JOHN MAYNARD KEYNES, *THE GENERAL THEORY OF EMPLOYMENT, INTEREST AND MONEY* 383 (London, Macmillan & Co. 1949) (1936).

In the case of Proposition II, commentators typically focus on environments in which innovation takes place without IP rights and then draw the conclusion that IP rights are often unnecessary. But there is a problem with this argument. Closer scrutiny shows that weak-IP or zero-IP environments typically are not property-free zones in any effective sense. Rather, firms employ alternative combinations of business strategies and technological controls to reinstate the entry barriers that would have been supplied by IP rights. Consistent with the critique of Proposition I, there is no reason to believe that those IP substitutes inherently impose lower access costs and entry barriers compared to an environment in which firms use IP rights to regulate and price access. The opposite may be the case.

In the case of Proposition III, commentators often assume that IP rights advance the interests of incumbents by raising barriers to entrants. This is consistent with natural intuitions and a long-standing “good guy/bad guy” narrative in IP policy discussions. However, it is *inconsistent* with a good deal of relevant evidence in both contemporary and historical markets. With the exception of the biopharmaceutical industry, large integrated technology firms tend to resist expansions of the patent system, both today and in the past. By contrast, R&D-intensive (and typically smaller) firms that lack independent production and distribution capacities tend to favor expansions of patent rights. Consistent with the critique of Proposition I, this divergence in policy preferences across the spectrum of organizational types suggests that weakening the IP system may sometimes protect large incumbent firms that maintain integrated production and distribution structures, while raising entry barriers to entities that are often smaller and operate as stand-alone R&D entities. The former population has ample access to IP substitutes and therefore may strategically prefer a world in which IP rights are weak or absent; the latter population faces the opposite situation. While policymakers and scholars may have neglected this perverse consequence of weakening IP rights, constituencies with significant investments at stake have not and have devoted their political influence resources accordingly.

Significant changes in U.S. patent law have been made and additional significant changes are currently under consideration by courts, legislators, and other policymakers. Any sound evaluation of the net effects of changes in IP rights, as well as the different effects those changes are likely to have on different constituencies, must be dynamic, not static. That is: it must embed IP rights within the broader set of IP-like strategies available to entities engaged in various stages of the innovation and commercialization process. The interaction between rights provided by the state and functional equivalents provided by the market supplies the foundation for analyzing more precisely the complex consequences of proposed changes in IP rights.

I. PROPOSITION I: IP INCREASES COSTS TO USERS AND RAISES ENTRY BARRIERS TO COMPETITORS

This proposition holds that IP rights increase the costs associated with the production and consumption of intangible goods (or tangible goods or services that embody intangible components). This proposition might appear to be self-evident. To understand why it is not, it is helpful to break up the proposition into its underlying elements. In the textbook treatment of the economics of IP, there are two costs that are always believed to increase as IP rights are introduced or expanded: (i) the deadweight losses that arise from the supra-competitive pricing enabled by IP rights; and (ii) the costs associated with the negotiation and dispute-resolution activities that inherently arise in connection with any IP system. By implication, that means that whenever IP rights are withdrawn or weakened, it becomes less costly to consume or otherwise use the intangible goods that would otherwise be governed by those rights. That is for two reasons: (i) the suppliers of those intangible goods are forced to charge a price closer to marginal cost, given actual or threatened imitations; and (ii) other innovators¹⁵ can use those goods to make extensions and improvements without having to pay a royalty or some other fee to avoid infringement liability. In the short term, these are desirable outcomes. The marginal cost of producing and delivering another copy of the Windows operating system is minimal and even approaches zero in digital distribution. Mass piracy would efficiently eliminate the deadweight losses generated by the above-cost pricing of Windows that persists under a robust IP regime. In the long term, however, this may be grossly *inefficient*. Marginal cost pricing means diminished expected profits, resulting in reduced R&D and fewer comparable-quality operating systems and related software applications that require approximately the same or greater levels of R&D and other investment. That countervailing concern supports the familiar economic case for IP rights, which drives pricing away from marginal cost in order to enable recovery of the fixed costs borne by the innovator and the entities that commercialize innovations.¹⁶ As is widely recognized, whether or not any incremental extension

¹⁵ Unless otherwise specified, throughout I use the term “innovator” to refer to entities and individuals that conceive, develop, produce, and distribute innovations. “Innovations” can refer to novel technologies or creative works.

¹⁶ The most common formulations of the economic case for IP tend to mention only or principally innovation costs. As several contributors have recently emphasized in the technology context, fixed commercialization costs typically exceed innovation costs by a large margin and must be recovered to support the efforts required to deliver an innovation to market. See Barnett, *Law of Organization*, *supra* note 13; Ted Sichelman, *Commercializing Patents*, 62 STAN. L. REV. 341 (2010); F. Scott Kieff, *Coordination, Property, and Intellectual Property: An Unconventional Approach to Anticompetitive Effects and Downstream Access*, 56 EMORY L.J. 327 (2006). Recently I extended this same rationale to content

of IP rights results in a net welfare gain depends on the tradeoff between, on the one hand, long-term gains from increased innovative output, and on the other hand, short-term losses from increased pricing and the transaction costs of IP-related licensing and dispute-resolution activities.

This conventional understanding of IP as a tradeoff between static and dynamic efficiency (that is, short-term and long-term gains and losses) may often overstate the above-cost pricing and transaction costs placed on the cost side of the social welfare ledger, which in turn makes the economic case for IP appear to be more tenuous than it deserves. The reason is that it is not clear that expanding IP rights typically increases access costs—defined to include supra-competitive pricing plus transaction costs—relative to any alternative *feasible* state of affairs. Specifically, it is not clear that IP rights typically compel intermediate and end-users to incur increased marginal access costs relative to the state of affairs that would be likely to exist in a market governed by weaker or no IP rights. In that alternative state of affairs, innovators will not sit with hands folded while free riders descend at will to enjoy the fruits of the innovators' labor. Nor will innovators necessarily exit the market in desperation. Rather, subject to budget constraints, innovators will seek to extract value from their existing and continued investments by relying on some combination of access-control mechanisms other than IP rights. The business management literature has described in detail, and market participants are well aware of, this rich alternative set of access controls. These include: technological obstacles to reverse engineering; brand awareness and customer loyalty; scale economies in production, marketing, and distribution; internal sources of capital; and internal know-how and other human capital.¹⁷ Given the high fixed costs and low marginal costs that typically characterize the development, production, and distribution of intellectual assets, a viable firm engaged in innovation over the long term *must* erect some entry barrier to generate the rents that push price above the sum of marginal plus fixed costs.¹⁸ Those market-generated entry barriers generate both supra-competitive pricing and transaction costs (imagine a user frustrated with anti-copying restrictions on a digital content file), *just like* formal IP rights

markets. See Jonathan M. Barnett, *Copyright Without Creators*, 9 REV. L. & ECON. 389 (2013) [hereinafter Barnett, *Copyright Without Creators*].

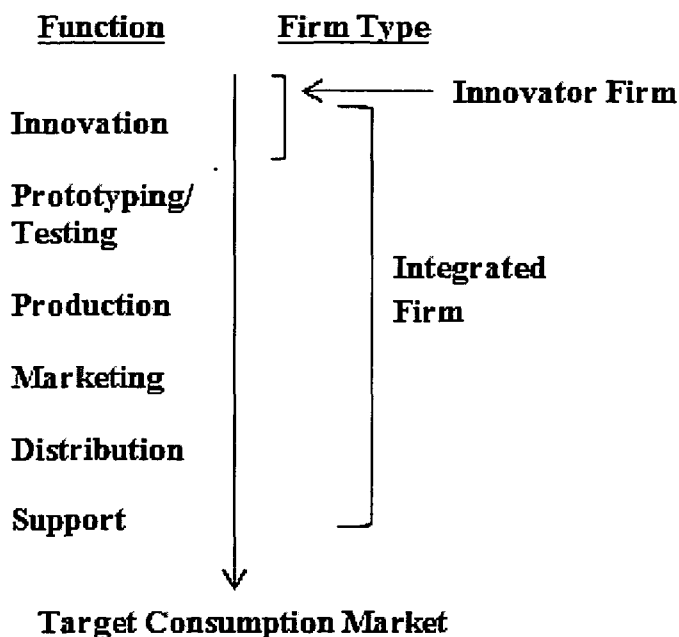
¹⁷ For the principal source in the business management literature, see David J. Teece, *Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy*, 15 RES. POL'Y 285, 288 (1986). For an extensive description of the related literature, see Barnett, *Law of Organization*, *supra* note 13; Jonathan M. Barnett, *Private Protection of Patentable Goods*, 25 CARDOZO L. REV. 1251 (2004).

¹⁸ John Duffy observes that no market would tolerate in equilibrium marginal-cost pricing since fixed costs could not be recovered. However, he contemplates that the alternative to using IP to incentivize innovation would be some type of social subsidy system, which is consistent with the conventional assumption that a world without IP would lack any other barriers against unauthorized imitation. See John F. Duffy, *The Marginal Cost Controversy in Intellectual Property*, 71 U. CHI. L. REV. 37 (2004).

supplied by the state. Hence, the alternative efficient world of marginal cost pricing envisioned by the conventional understanding of IP would never persist in any environment that continued to support private investment in innovation activities. If that is the case, then the true social choice is between (i) a world with formal IP rights and some mix of transaction costs and supra-competitive pricing; and (ii) a world with functional non-IP alternatives and *some other* mix of transaction costs and supra-competitive pricing. The difference between a strong-IP and weak-IP (or no-IP) environment is a difference in degree, not kind.

Conventional analysis assumes that access costs are always higher under a weak-IP as compared to a strong-IP environment. This assumption no longer universally holds true under a dynamic analysis that takes into account market responses to changes by the state in formal IP protection. Whether access costs will rise or fall as IP rights are made stronger or weaker depends on the costs required to implement alternative non-IP mechanisms by which firms can capture returns on innovation. Over a significant range of commercially relevant circumstances, those alternative mechanisms may impose greater access costs relative to IP rights. That gives rise to the possibility that reducing IP rights may inflate the price of accessing the relevant set of technological or creative inputs, which in turn may slow down the flow of technological and creative innovations. This is not to say that upward and downward adjustments in IP rights will always have this unexpected effect. Rather, it is simply to say that, *a priori*, those adjustments may have either effect.

Below I present a more systematic framework for anticipating the effects of changes in the strength of IP rights, taking into account firms' ability to migrate toward alternative rent-extraction instruments even if the state withdraws or weakens IP rights. To structure the discussion, I will focus on two paradigmatic entity types in any technology or content environment. These are: (i) the unintegrated (and often smaller) firm that primarily undertakes R&D and other innovation activities; and (ii) the integrated (and often larger) firm that independently undertakes the full suite of innovation, production, distribution, and other commercialization activities required to deliver an innovation from lab to market. I will call the former entity, the "Innovator Firm," and the latter entity, the "Integrated Firm." As shown graphically below, these two entities are distinguished by a simple difference in scope: whereas the Innovator Firm only occupies the top of the supply chain, the Integrated Firm occupies its full length. While this two-entity menu is a simplification for analytical purposes (in particular, it does not break out the full spectrum of partially integrated firm types), these two entity types together cover the typical innovation and commercialization pathways by which technological and creative inputs are generated, embedded in consumption goods, and marketed and distributed in end-user markets.

Figure I: The Supply Chain and Firm Types

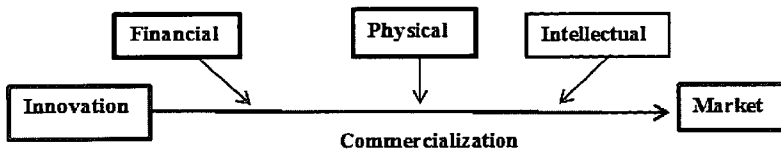
In the discussion below, I will adopt a simplifying assumption that strongly biases the discussion *against* any economic case for IP rights. Namely, I will assume that IP rights play no role in frustrating imitation upon release into the target consumption market, but do play a role in frustrating imitation at higher portions of the market supply chain. For example, this would be the case with respect to a technology that is (i) hard to reverse-engineer when embodied in a product released into retail distribution in the target consumption market, but (ii) easy to reverse-engineer when embodied in an early-stage prototype that is disclosed to investors or suppliers of production or distribution services. This assumption helps to isolate the efficiency effects of IP rights at all steps *prior* to release into the target consumption market. Even under this unrealistically IP-hostile assumption, the economic case for the necessity of IP rights holds over a significant range of commercially significant circumstances. Removing this assumption therefore simply bolsters any IP-favorable conclusions reached below.

A. *Case I: The Innovator Firm*

Consider the perspective of a profit-seeking individual or entity that holds a commercially valuable intellectual asset—for example, a new chip design, a new drug, or a new movie script. To realize the commercial value

of that intangible asset, the holder must execute a host of complex and costly actions in order to translate the underlying technology or creative idea into a tangible good or service that is viable for consumption at a competitive price by the target user population. These are the “nitty-gritty” but critical tasks required to achieve commercialization, including prototyping, testing, regulatory filings, production, marketing, and distribution. As shown graphically below, reaching market release through these actions requires three types of capital inputs: financial capital, physical capital, and intellectual capital. It is precisely at this point—that is, prior to release into the target user market—that IP rights can reduce the cost of acquiring these capital inputs, thereby reducing commercialization costs and, ultimately, the price paid by end-users in the target market. Compared to the alternative state of affairs in which IP rights are absent or weaker, robust IP rights can reduce the costs borne by an innovator (or the holder of an innovation) in accessing the capital inputs required to reach market and realize the value from its investment in generating and developing its intangible assets.

Figure II: Required Capital Inputs from Innovation to Market Release



The extent to which IP rights are a precondition for commercialization by an innovator firm is a function of the extent to which the relevant technology is susceptible to expropriation by actual and potential competitors as it moves down the supply chain. In the following discussion, I first look at the case in which expropriation risk is high and IP rights enable an innovator to interact with investors and other third parties that might otherwise pose a high expropriation risk. I then look at the case in which expropriation risk is low; as I explain below, even in that case, IP rights are likely to deliver efficiency gains and facilitate the commercialization process.

1. Sub-Case I: High Expropriation Risk

Assume (reasonably in most cases) that our innovator firm lacks sufficient wealth, infrastructure, and expertise—the concrete realizations of the capital inputs mentioned above—to singlehandedly convert its novel idea into a viable consumption good and distribute that good at cost-competitive levels to a mass market. Hence, without some interaction with other parties that can supply those required inputs at a competitive cost, the idea’s commercial value will remain suppressed. In seeking financial capital from an

investor, lender, or some other type of business partner, the innovator must disclose at least part of its idea to a third party that has potentially adverse interests. Without that information, the prospective supplier of financial capital cannot evaluate the idea's commercial value. The same may be true to a lesser extent of suppliers of physical and intellectual capital, who may require information about the innovation in order to provide the appropriate set of capital inputs. As Kenneth Arrow famously observed, this poses a dilemma. As soon as the innovator discloses the technology, the counterparty has little incentive to continue with the transaction; rather, that counterparty will imitate the technology and seek to capture all profits for itself.¹⁹ Having incurred the R&D costs and still lacking the required capital inputs to move down the supply chain, the innovator will be unable to compete, resulting in effective forfeiture of the innovation to the free-riding counterparty. By anticipation, the innovator declines to innovate and the innovation process stalls.

In practice, the expropriation risk that drives Arrow's dilemma, and the resulting sequence of effects leading to under-innovation, is sometimes not as severe as that stylized set-up would suggest. There are three reasons. First, repeat-play parties may have reputational incentives to forego the short-term gains from expropriating an innovator's idea in order to maximize the long-term stream of future opportunities that can be sourced from the same innovator plus all other innovators. A one-time expropriation gain may be a negative expected-value option if it cuts off a sufficiently lucrative future stream of expected revenues. Second, an innovator may be able to gradually disclose portions of his idea as the counterparty makes incremental irrevocable investments in the parties' relationship.²⁰ This will be most feasible in the case of technologies that require the innovator's know-how to complete the product development and commercialization process, thereby providing a powerful incentive to an investor to refrain from expropriating the innovator's technology. Third, the supplier of one type of capital input may lack sufficiently low-cost access to the other capital inputs required to commercialize the innovators' technology, in which case it does not pose a credible expropriation threat. This would probably be a fair characterization of some financial investors in a technological or creative enterprise.²¹

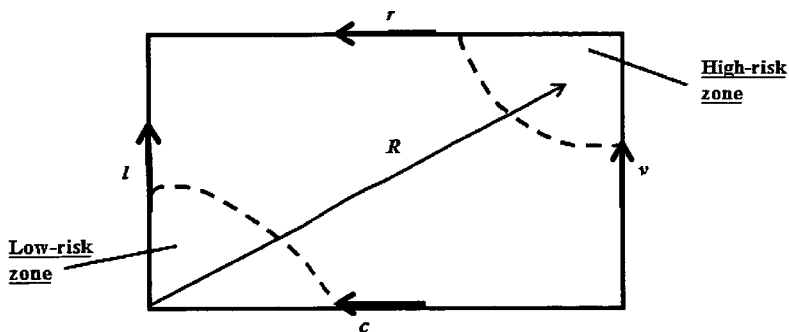
¹⁹ See Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609 (Nat'l Bureau of Econ. Research 1962).

²⁰ For evidence that this occurs in certain transactions in the biotechnology industry, see Michael J. Burstein, *Exchanging Information Without Intellectual Property*, 91 TEX. L. REV. 227, 232-33 (2012).

²¹ Some but not all. A venture capital firm, for example, may pose an expropriation threat because it typically holds a portfolio of investee companies, some of which may hold the inputs required to commercialize the idea disclosed by an inventor that seeks financing from the VC firm.

Those alternative protections against expropriation risk do not render moot Arrow's dilemma. Properly understood, they imply that the severity of Arrow's dilemma, and the associated level of expropriation risk, will differ in degree depending on the relevant transactional setting. As depicted below, expropriation risk, denoted by R , can be understood as a function of the following factors: (i) the idea's commercial value, denoted by v ; (ii) the counterparty's observable reputational capital (and/or incentives to acquire it), denoted by r ; (iii) the "lumpiness" of the idea, which makes it less amenable to graduated disclosure, denoted by l ; and (iv) the counterparty's relative costs of developing and commercializing the idea, as compared to the innovator, denoted by c . The expropriation risk behind Arrow's dilemma will be especially high if: (i) the idea has exceptional commercial value (which increases the expected gains from expropriation); (ii) the counterparty is not a known repeat player or cannot credibly commit to repeat play; (iii) the idea is "lumpy" and not amenable to graduated release of discrete components; or (iv) the counterparty is an operational entity that can develop and commercialize the idea at a lower cost than the innovator. Expropriation risk declines as one or more of these values tends to be reversed.

Figure III: Expropriation Risk in Information Transactions



This diagram encapsulates the chief transactional contribution of a secure IP right: it converts high-risk transactions into low-risk transactions by limiting the counterparty's ability to expropriate the innovator's idea. Subject to adoption and enforcement costs, IP rights expand the universe of counterparties with whom an innovator can contract in order to deliver an innovation to market. This function supports the typical inverted pyramid structure observed in technology and creative markets: a large population of smaller upstream firms supply R&D or creative inputs to a small group of larger downstream firms that supply scale economies in production and distribution. Take the motion picture industry: hundreds of independent content production firms, and an ever larger number of individual content suppliers (e.g., writers and other "idea" sources), partner with a small group

of major studios that offer scale-efficient and difficult-to-replicate marketing and distribution capacities. Take the biopharmaceutical industry: hundreds of small biotechnology firms contract with a small number of large pharmaceutical firms that can sustain the heavy costs associated with the FDA testing process and subsequent production, distribution, and marketing tasks required to deliver a new drug to market.²² This structural commonality across markets is not accidental. Without IP rights to block unconsented use, these transactions would be economically irrational or, at least, far more costly to execute: absent reputational constraints or a graduated disclosure mechanism, the downstream firm would expropriate the upstream firm's intangible asset at will.²³

It might still be objected that Arrow's dilemma is a matter of limited concern since innovators can mitigate it by avoiding transactions with outside parties,²⁴ vertically integrating down the supply chain, and reaching the target consumption market independently.

There are two reasons why this argument is unpersuasive.

First, it assumes that the innovator has sufficient internal capital and expertise to self-execute a vertically integrated supply chain leading to market release. If that assumption is not satisfied (as would typically be the case in any economically significant undertaking), then the upstream innovator must seek external capital and expertise, which at least partially restores the expropriation risk identified by Arrow's dilemma.

Second, and even continuing to assume (unrealistically) no expropriation risk in negotiating funding from external capital sources, this argument confuses adequacy for optimality. Consider the Figure below: it depicts the full range of transactional choices available to an innovator firm as it moves down the supply chain toward market release. With respect to each commercialization function, the innovator firm can execute it internally or procure it externally by contract. Efficiency demands that the innovator construct the least-cost combination of internal and external procurement choices at every point on the supply chain. Weak or zero IP rights truncate the feasible set of transactional choices, compelling the innovator to select only the highest levels of vertical integration as denoted by the dashed lines on the extreme left-hand side of the Figure. The potential result: even if the

²² See Gary P. Pisano, *The Governance of Innovation: Vertical Integration and Collaborative Arrangements in the Biotechnology Industry*, 20 RES. POL'Y 237 (1991).

²³ It is sometimes thought that a non-disclosure agreement could remedy the dilemma captured by Arrow's dilemma. That is erroneous: in advance of disclosure of the idea, an idea recipient may be willing to agree not to disclose the idea to other parties; however, it will never rationally agree not to use the idea since it may already have developed the same or a similar idea.

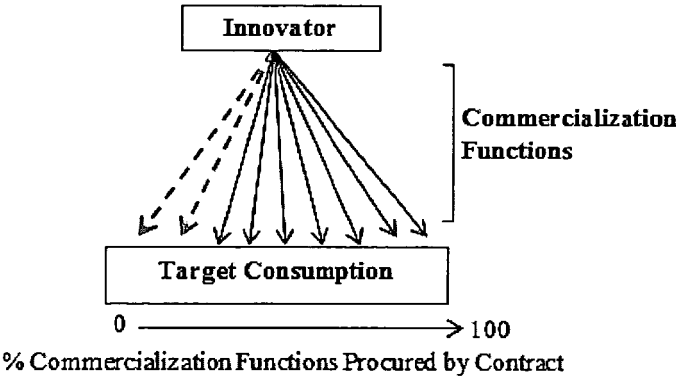
²⁴ I say "mitigate" rather than "eliminate" because the innovator firm that pursues vertical integration will continue to face expropriation risk from its employees. However, that expropriation risk can be addressed in part through compensation schedules and contractual instruments such as invention assignment, non-disclosure and non-competition agreements. For more extensive discussion, see Jonathan M. Barnett & Ted Sichelman, *Revisiting Labor Mobility in Innovation Markets* (Working Paper 2016).

innovator can reach market independently and avoid expropriation risk under a weak or zero IP regime, it may have suffered increased commercialization costs by adopting over-integrated organizational forms and foregoing transactions with third parties that have comparative advantages in supplying some of the capital inputs required to reach market.²⁵ Transactional rigidity translates into efficiency losses: inflated commercialization costs means that consumers suffer an increase in prices, a reduced flow of innovations, or both. Restoring or increasing IP rights reverses those effects.²⁶

²⁵ A recent development concerning Rambus, a well-known “fabless” chip design company may illustrate this contingency. In 2015, Rambus announced that it would partially abandon its existing business model, which had focused on making chip designs and then licensing the patented designs to other chip designers and manufacturers. Rambus indicated that, in response to what it described as an adverse legal climate for patent enforcement, it would shift its operations to include the production and marketing of chips under its own brand. See Don Clark, *Rambus Expands With Its Own Chip Brand*, WALL ST. J. (Aug. 17, 2015), <http://www.wsj.com/articles/rambus-expands-with-its-own-chip-brand-1439784003>.

²⁶ For further elaboration of the relationship between intellectual property and organizational form, see Barnett, *Law of Organization*, *supra* note 13. That work contributes to a line of legal scholarship concerning the interaction between intellectual property rights and organizational form. This approach originated among legal scholars in Martin J. Adelman, *The Supreme Court, Market Structure, and Innovation: Chakrabarty, Rohm and Haas*, 27 ANTITRUST BULL. 457 (1982), while recent interest dates from Ashish Arora & Robert P. Merges, *Specialized Supply Firms, Property Rights and Firm Boundaries*, 13 IND. & CORP. CHANGE 451 (2004), and Dan L. Burk, *Intellectual Property and the Firm*, 71 U. CHI. L. REV. 3 (2004). For other contributions by legal scholars, see generally Oren Bar-Gill & Gideon Parchomovsky, *Law and the Boundaries of Technology-Intensive Firms*, 157 U. PA. L. REV. 1649 (2009); Dan L. Burk & Brett H. McDonnell, *The Goldilocks Hypothesis: Balancing Intellectual Property Rights at the Boundary of the Firm*, 2007 U. ILL. L. REV. 575 (2007); Paul J. Heald, *A Transaction Costs Theory of Patent Law*, 66 OHIO ST. L.J. 473 (2005); Kieff, *supra* note 16; Robert P. Merges, *A Transactional View of Property Rights*, 20 BERKELEY TECH. L.J. 1477 (2005); Liza Vertinsky, *An Organizational Approach to the Design of Patent Law*, 13 MINN. J.L. SCI. & TECH. 211 (2012). The business history literature has pursued a related line of inquiry, which has generated a useful body of empirical results. For an overview, see Naomi R. Lamoreaux & Kenneth L. Sokoloff, *Long-Term Change in the Organization of Inventive Activity*, 93 PROC. NAT’L ACAD. U.S.A. 12686 (1996).

Figure IV: Intellectual Property and Transactional Choice



2. Sub-Case II: Low Expropriation Risk

Assume again an innovator who lacks sufficient independent wealth and therefore seeks financial capital to develop a new drug. Assume further that r is high: that is, the potential supplier of financial capital operates under strong repeat-play considerations that will most likely recommend against imitating an idea proposed by an inventor or an entity that holds an intangible good and would like to commercialize it. Or assume that c is high: the potential supplier of financial capital is a non-operational entity with no technical expertise and no capacity to develop the idea without the innovator's assistance or the assistance of some other party (with respect to whom the information paradox would again obstruct negotiations). So expropriation risk is low. Those friendly settings would seem to render moot the transactional advantages ascribed above to IP rights. Not so—for two reasons.

First, a securely enforceable IP right is likely to compare favorably as a transactional tool with reputational and graduated disclosure mechanisms for protecting against expropriation risk. Unlike reputational mechanisms, an IP right does not limit the possible universe of transacting parties with whom to negotiate safely over informational assets. Unlike graduated disclosure mechanisms, an IP right does not limit the possible universe of transactional structures for negotiating over information assets. Secure IP rights enable innovators, or the holders of innovation assets, to transact freely over the entire universe of potential counterparties using the entire feasible universe of transactional structures. Of course, depending on the particular market, intellectual asset and IP right in question, this proposition

loses some, but not all, of its force once we take into account the costs required to adopt and enforce IP rights.

Second, again assuming low to zero expropriation risk, an IP right still has significant value as a mechanism by which to reduce commercialization costs and ultimately, depending on competitive conditions, the price paid by the target user. The reason is uncontested in the case of real estate and other tangible goods markets: the presence of a property right provides a “hard” asset that backs up the borrower or investee’s otherwise difficult-to-verify claims of positive expected returns and therefore reduces the cost of accessing external capital. This surprisingly under-discussed advantage applies with little modification to intangible goods settings. The effects can be dramatic and run directly counter to the conventional assumption that IP rights increase the transaction costs of IP-related development, production, and distribution activities.

Consider the case of Marvel Enterprises (“Marvel”). In 2005, Marvel, the famous but then-fatigued comic books franchise that had exited bankruptcy several years earlier, sought to integrate vertically forward by independently producing films based on its portfolio of “superhero” characters.²⁷ To secure the necessary financing, Marvel entered into a \$525 million financing arrangement with Merrill Lynch.²⁸ Simultaneously, Ambac Assurance Corporation (Ambac), a third-party insurer, provided a guarantee under which, in the event the Marvel films did not achieve certain performance targets, Ambac would cover Marvel’s outstanding interest payments and have the right to seize the supporting collateral—namely, the movie rights to the characters in the financed productions.²⁹ This insured financing structure supported the explosive growth of the Marvel franchise through a series of hit releases, which led to Marvel’s reincarnation as a motion picture studio and subsequent acquisition by Disney for \$4.3 billion in 2009.³⁰ This financing vividly illustrates the value created by the transactional functions of an IP right. Marvel’s copyright-protected portfolio enabled it to secure the required inputs from production, distribution, and financing partners, which in turn supported content generation, marketing, and distribution activities that realized exceptional returns for shareholders and, based on the market success of Marvel’s motion pictures, consumption benefits for end-users.³¹

²⁷ See Sharon Waxman, *Marvel Wants to Flex Its Own Heroic Muscles as a Moviemaker*, N.Y. TIMES (June 18, 2007), http://www.nytimes.com/2007/06/18/business/media/18marvel.html?pagewanted=print&_r=0; Devin Leonard, *Calling All Superheroes*, FORTUNE, (May 23, 2007, 1:37 PM), http://archive.fortune.com/magazines/fortune/fortune_archive/2007/05/28/100034246/index.htm.

²⁸ See Form 8-K, Item 1.01, Marvel Enterprises, Inc., Securities & Exchange Commission (Aug. 30, 2005), at 2; Waxman, *supra* note 27.

²⁹ See Form 8-K, *supra* note 28, at 2; Waxman, *supra* note 27; Leonard, *supra* note 27.

³⁰ See Brooks Barnes & Michael Cieply, *Disney Swoops Into Action, Buying Marvel for \$4 Billion*, N.Y. TIMES (Aug. 31, 2009), <http://www.nytimes.com/2009/09/01/business/media/01disney.html>.

³¹ See Waxman, *supra* note 27; Leonard, *supra* note 27.

The Marvel example is far from idiosyncratic. As could be illustrated by any one of the technology and content licensing, financing, and investment transactions entered into on a daily basis, IP rights facilitate market entry by enabling entities that have limited independent sources of wealth and/or expertise to transact safely with entities that can supply those necessary inputs and move a novel technology or creative work toward market release. By enabling transactions with an expanded pool of financing parties and lowering the innovator's cost of capital, IP rights increase entry, increase the number of competitors, and ultimately, may lower the prices paid by end-users or increase the output flowing to end-users in the target market. Withdrawing or reducing IP rights would undo or frustrate those transactions and reverse or diminish those effects.

B. *Case II: Large Firm*

Even if all the above is accepted as true, it might be objected that a large integrated firm, which typically has internal access to all three required capital inputs, would not suffer from these transactional dilemmas to any significant extent, resulting in no adverse effect on commercialization costs or the flow of innovation even in the absence of robust IP rights. Given the informational asymmetries and adverse selection effects that are widely observed to afflict transactions between innovators and outside investors (and therefore compel innovators to accept a discount even in the case of start-ups that have developed high-value technologies), internal funding for R&D is generally thought to be less costly as compared to external funding.³² In turn, a firm with sufficient internal capital will tend to have sufficient internal expertise and infrastructure to achieve commercialization independently. That is precisely the in-house R&D, production, and distribution model largely followed by highly integrated technology firms like Apple, Intel, and once followed by formerly integrated technology firms like IBM. A firm that internalizes all commercialization functions sidesteps much of the expropriation risk inherent to negotiations over informational assets with unrelated third parties, in which case the transactional advantages ascribed above to IP rights would again appear to be moot or at least, substantially limited.

³² See WILLIAM L. BALDWIN & JOHN T. SCOTT, MARKET STRUCTURE AND TECHNOLOGICAL CHANGE 13-14 (F.M. Scherer 1987). This is a more aggravated case of the "pecking order" thesis in financial economics, which states that external cost of capital usually exceeds the internal cost of capital. Reasons include: (i) in the case of debt finance, the firm must bear the cost of interest payments and the risk of bankruptcy for failure to repay; and (ii) in the case of equity finance, the firm's existing shareholders must bear the cost of dilution by new investors. None of those costs pertain in the case of internal finance. See Stewart C. Myers & Nicholas S. Majluf, *Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have*, 13 J. FIN. ECON. 187, 196-98 (1984).

That objection is unpersuasive. The “integration solution” to Arrow’s dilemma may represent a merely adequate, rather than an optimal, transaction structure for innovating and commercializing innovation in the absence of IP rights. A market that responds to the absence of IP rights by funding and executing the innovation and commercialization process within self-contained integrated entities may have achieved commercialization without IP rights, but it has potentially done so at a stiff price. Specifically, the “integration solution” to supporting innovation in the absence of IP rights can generate two social harms.

1. Weak IP Rights Increase Entry Costs

“Innovation via integration” significantly, if not drastically, inflates the costs of entry into the relevant innovation market. In fact, it may inflate those costs so greatly that only a small cohort of integrated firms with large economies of scope and scale, and generous internal funding capacities, can sustain those costs. Only a small number of firms can sustain the billions of dollars, ranging from an estimated \$3.5 to \$10 billion, required to construct and maintain a new semiconductor chip production (known as a “fabrication” or “fab”) facility.³³ In a market with IP rights, an innovator’s entry costs may be drastically reduced. Now it must bear only the cost of executing the innovation functions at the top of the supply chain—for example, a “fabless” firm that has developed a new design for a semiconductor chip but lacks any other downstream commercialization capacities, and therefore contracts with third parties for production, marketing, and distribution services. In a market without IP rights, that same innovator can only expect to recover a return on its R&D investment by assembling a bundled package of innovation and commercialization inputs, which implies a greater, and potentially drastically greater, level of capital requirements with a drastically inflated level of risk. The extent of compelled bundling under a weak or zero-IP regime will depend on the extent to which expropriation risk arises at each point of the supply chain, which is in turn a function of the repeat-play factors and graduated disclosure mechanisms that may sometimes constrain expropriation risk. Given those inflated capital costs and associated entry barriers, the group of surviving firms may have secured higher levels of market power than would prevail in an environment “burdened” by strong IP rights that would lower transaction costs and enable targeted entry at discrete points on the market supply chain. Paradoxically, the absence of IP rights can provide incumbents—and specifically, firms that already maintain, or can internally fund, an independent commercialization infrastructure—with strong protection against more innovative entrants.

³³ See Nicolas Mokhoff, *Semi Industry Fab Costs Limit Industry Growth*, EE TIMES (Oct. 3, 2012 3:00 PM), http://www.eetimes.com/document.asp?doc_id=1264577.

2. Weak IP Rights Distort Organizational Choices

Previously I had discussed the manner in which weak IP rights distort a small-firm innovator's organizational choices as it seeks to move an innovation along the supply chain toward market release. The same distortionary effect can apply to a large firm that has the resources to independently execute the commercialization process. The reason is one and the same. Given the reduced organizational choice set available under weak or zero IP rights, there is no longer any assurance that the organizational structures actually used to conduct and commercialize innovation represent the most efficient possible outcome. It *may* be the case that vertically integrated structures are sometimes the most efficient environment for conducting innovation and commercialization. But it will surely not always be the preferred organizational form, even for large firms with access to healthy internal capital resources. Again, take the semiconductor market. Intel, the world's largest semiconductor manufacturer (market capitalization of \$140.6 billion as of January 20, 2016)³⁴ uses a vertically integrated model that typically executes each stage of the innovation and commercialization process through manufacture and distribution. By contrast, Qualcomm, the world's leader in the supply of semiconductors for cellphones and smartphones (market capitalization of \$69.3 billion, as of January 20, 2016),³⁵ has adopted a vertically dis-integrated model in which it mostly focuses on chip design and extracts revenues through downstream licensing to handset and other device manufacturers. In other cases, Qualcomm contracts with third-party foundries for manufacturing and other services at intermediate points in the supply chain.³⁶ Without patents, Qualcomm could not safely enter into transactions with hardware manufacturers or foundries, which would in turn compel the adoption of vertically integrated structures to limit knowledge leakage in the commercialization process.

Any market in which firms have adopted vertical integration as a response to expropriation risk under a weak or zero-IP regime—and therefore appears to support innovation without significant reliance on IP rights—may be operating under inefficiently high levels of vertical integration. This will *necessarily* be the case to some extent with respect to any firm that is not the least-cost provider of every function in the innovation and commercialization process. The result is a reversal of the standard proposition that reflexively associates reduced IP with reduced costs. Whenever innovators respond to the absence of IP rights by adopting integrated organizational structures, commercialization costs have potentially increased relative to the structures that would have been feasible under a stronger

³⁴ YAHOO! FINANCE, [HTTP://FINANCE.YAHOO.COM/](http://finance.yahoo.com/).

³⁵ YAHOO! FINANCE, [HTTP://FINANCE.YAHOO.COM/](http://finance.yahoo.com/).

³⁶ Form 10-K, Qualcomm Inc. (Fiscal Year Ended Sept. 28, 2014).

level of IP protection. Increased commercialization costs may be reflected in inflated prices paid by users of the relevant intangible goods (or the tangible goods in which those intangible components are embedded), restricted output, and/or a reduced flow of innovations. Re-introducing or expanding IP rights reverses those effects, potentially resulting in lower prices, expanded output, and/or an increased flow of innovations.

II. PROPOSITION II: THERE IS SIGNIFICANT IP WITHOUT IP

This proposition holds that there are a significant number of markets in which intellectual production proceeds at robust levels but IP rights are absent. The importance of this observation is that it suggests or shows that IP rights are unnecessary because innovation would and does proceed even when those rights are compromised or entirely absent.

This line of thought appears to largely derive from an influential article published in 1970 by now-Justice Stephen Breyer, who identified mechanisms by which U.S. publishers in the 19th century successfully earned profits on foreign literary works even when U.S. law denied copyright protection to those works.³⁷ Following Justice Breyer's lead, other commentators have documented various examples to illustrate that IP can be sustained without IP, or without robust IP rights. These include: fashion design and luxury goods³⁸, gourmet cuisine,³⁹ academic research,⁴⁰ open-source software,⁴¹ magic performances,⁴² stand-up comedy routines,⁴³ roller derbies,⁴⁴

³⁷ See Stephen Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 HARV. L. REV. 281, 299-300 (1970). Those mechanisms principally included: (i) the natural lead time advantage enjoyed by the first publisher; and (ii) "fighting editions"—that is, the practice of selling a book at unsustainably low prices in response to piracy.

³⁸ See KAL RAUSTIALA & CHRISTOPHER SPRIGMAN, *THE KNOCKOFF ECONOMY: HOW IMITATION SPARKS IMITATION* 19-55 (2012) [hereinafter RAUSTIALA & SPRIGMAN, *KNOCKOFF ECONOMY*]; Kal Raustiala & Christopher Sprigman, *The Piracy Paradox: Innovation and Intellectual Property in Fashion Design*, 92 VA. L. REV. 1687, 1693-1704 (2006) [hereinafter Raustiala & Sprigman, *Piracy Paradox*].

³⁹ See Emmanuelle Fauchart & Eric von Hippel, *Norms-Based Intellectual Property Systems: The Case of French Chefs*, 19 ORGANIZATIONAL SCI. 187, 191-92 (2008).

⁴⁰ See LESSIG, *FUTURE OF IDEAS*, *supra* note 8; Arti Kaur Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, 94 NW. U. L. REV. 77, 95 (1999).

⁴¹ See BENKLER, *supra* note 8; LESSIG, *FUTURE OF IDEAS*, *supra* note 8; Yochai Benkler, *Coase's Penguin, or, Linux and the Nature of the Firm*, 112 YALE L.J. 369, 371 (2002); Boyle, *supra* note 8.

⁴² See Jacob Loshin, *Secrets Revealed: How Magicians Protect Intellectual Property Without Law*, in *LAW AND MAGIC* 125-27 (Christine A. Corcos ed., 2010).

⁴³ See Dotan Oliar & Christopher Jon Sprigman, *Intellectual Property Norms in Stand-Up Comedy*, in *THE MAKING AND UNMAKING OF INTELLECTUAL PROPERTY: CREATIVE PRODUCTION IN LEGAL AND CULTURAL PERSPECTIVE* 386-89 (Mario Biagioli et al. eds., 2010).

⁴⁴ See David Fagundes, *Talk Derby to Me: Intellectual Property Norms Governing Roller Derby Pseudonyms*, 90 TEX. L. REV. 1093, 1108-13 (2012).

and online fan fiction.⁴⁵ Some interpretations of these phenomena, including the interpretation originally advanced by Justice Breyer,⁴⁶ have gone further and argued that these peripheral cases cast doubt on the core economic case for IP rights.⁴⁷ That is, it may be the case that innovation would proceed robustly without IP rights, or without robust versions of IP rights, in a large number of other markets or in markets generally.

This expansive interpretation runs into two difficulties. First, it overlooks the fact that examples of “IP without IP” usually describe environments that have few applications to capital-intensive and commercially significant innovation markets. Second, and more fundamentally, this interpretation overlooks the fact that these examples usually make some disguised use of IP rights or a functionally equivalent access-control mechanism. Relatedly, this interpretation overlooks the possibility—just as Proposition I overlooked the possibility—that these alternative access-control mechanisms may impose greater access costs and higher entry barriers relative to a market in which IP rights were stronger.⁴⁸

A. *Intrinsic Motivation*

As suggested by the examples listed above, the “IP without IP” proposition mostly finds support in non-commercial, artisanal, or other settings in which intrinsic motivation is sufficient to support incentives to engage in creative or technological innovation. Take the oft-repeated example of online fan fiction. It is not surprising to learn that intrinsically motivated creators do not require the “carrot” of copyright to engage in writing or other forms of creative expression, perhaps so long as an attribution norm is respected. But that observation has few implications for creative and technological activities that require significant participation by non-creative and non-innovator entities to mass-produce, mass-market, and mass-distribute the relevant item. Intrinsic motivation and reputational capital will not provide sufficient incentive for the mundane but necessary activities without

⁴⁵ See Rebecca Tushnet, *Payment in Credit: Copyright Law and Subcultural Creativity*, 70 L. & CONTEMP. PROBS. 135, 140 (2007).

⁴⁶ See Breyer, *supra* note 37, at 299-300.

⁴⁷ See BENKLER, *supra* note 8; RAUSTIALA & SPRIGMAN, KNOCKOFF ECONOMY, *supra* note 38; Michael A. Carrier, *Cabining Intellectual Property Through a Property Paradigm*, 54 DUKE L.J. 1, 31-34 (2004); Sunder, *supra* note 8; Zimmerman, *supra* note 8; see also Rochelle Cooper Dreyfus, *Does IP Need IP? Accommodating Intellectual Production Outside the Intellectual Property Paradigm*, 31 CARDOZO L. REV. 1437, 1447-52 (2010) (with some qualification).

⁴⁸ For fuller discussion of the following points, see generally Barnett, *Illusion of Commons*, *supra* note 13. For some of the reasons identified above, Robert Merges expresses similar skepticism about the implications of these examples for IP rights in general. See Robert P. Merges, *Economics of Intellectual Property Law* (Mar. 2014), in OXFORD HANDBOOK OF LAW AND ECONOMICS (Francesco Parisi ed. forthcoming) [hereinafter Merges, *Economics*].

which creative and technological goods typically cannot reach market on a mass scale. Take the example of open-source software, which is assembled through contributions from volunteer programmers and then released at no charge. It is suggestive that the Linux operating system, the most well-known open-source software application, has achieved low rates of penetration into the desktop computing market (less than 2% as of December 2015),⁴⁹ even though it offers several hundred dollars in up-front savings relative to Microsoft Windows. As I have described elsewhere in greater detail, the principal reason appears to be (in somewhat simplistic terms) that Linux lacks an operating manual and a post-purchase support system.⁵⁰ That is, providing a competitive alternative to Windows would require undertaking the “heavy lifting” required to deliver the updating and support functions that unsophisticated individual and small-business users demand, but from which volunteer programmers can derive little intrinsic satisfaction.⁵¹ The failure of Linux to capture market share in the consumer PC market even at a *zero* sales price generalizes to a host of other innovation markets. Even if creative artists or research personnel derive sufficient intrinsic motivation to engage in artistic production or technological innovation without any supplemental monetary incentive (beyond, I assume, compensation sufficient to buy lunch and pay rent), the absence of a significant expected profit stream will discourage the remaining pool of non-creative participants that must execute the production, marketing, distribution and other tasks that are typically required to deliver a viable product to a mass consumption market.

B. *Capital Requirements*

The “IP without IP” proposition tends to describe environments in which creative or technological activity does not require significant capital investment. Consider an example such as academic writing, which operates in a weak-IP environment because the ideas in those works are generally unprotected and can freely be used subject to compliance with an attribution custom that supports the industry’s reputation-based credit system. It

⁴⁹ NETMARKETSHARE, DESKTOP OPERATING SYSTEM MARKET SHARE, <http://marketshare.hitslink.com/operating-system-market-share.aspx?qprid=8&qpcustomd=0> (last visited Jan. 8, 2016).

⁵⁰ See Jonathan M. Barnett, *The Host’s Dilemma: Strategic Forfeiture in Platform Markets for Informational Goods*, 124 HARV. L. REV. 1861, 1898-2000 (2011) [hereinafter Barnett, *Host’s Dilemma*].

⁵¹ There is a potentially selfish motivation behind developers’ relative unwillingness to invest in support and documentation functions, as compared to programming functions. Investment in the latter function enhances the programmer’s reputational capital in the relevant labor market and enables the programmer to acquire greater technical skills, in both cases leading to potential income-producing opportunities in the future. None of this would be true of investments in non-technical functions.

is not surprising to learn that copyright is not required to incentivize a law professor to engage in academic research, because (i) as noted above, it is an intrinsically satisfying activity; (ii) it generally does not require significant capital investment; (iii) it generally has little commercial value; and (iv) its authors earn revenue from an alternative source (namely, a tuition-supported, philanthropically supported, and taxpayer-supported academic institution). Hence, law professors typically license their copyright for no compensation when a paper is accepted for publication. Without significant capital requirements, there is no imperative to exercise the pricing power required to generate a stream of funds to cover those requirements. If we further assume that the innovator is intrinsically motivated, then there is no imperative to obtain the pricing power associated with IP rights. And if we further assume that the innovator's work typically has little commercial value, then there is no pricing power that IP rights could secure under any plausible scenario. However, when these three characteristics are no longer satisfied—that is, innovation or commercialization requires significant capital, extrinsically motivated parties are required to complete commercialization, and there is significant commercial value at stake—then the case for IP re-emerges with force.

This is a critical qualification because it implies that, as *any* innovation market grows and expands, it will require some form of IP to induce rational investment of the financial, physical, and intellectual capital typically required to achieve production and distribution into lucrative mass markets.⁵² This can be illustrated by returning to the example of academic research. While academic research thrives with weak or zero levels of formal IP (albeit with the support of substantial tax-based and philanthropic transfers), subject to the academic community's strong attribution norms, universities' technology transfer offices are active adopters of patent rights. The reason is an especially direct implication of Arrow's paradox: without patents, universities, which are legally constrained as non-profit entities from integrating forward into commercial production, cannot transact with the third parties that must be engaged to extract economic value from the fruits of a university's R&D activities.

C. *The "No Free Lunch" Principle*

Most fundamentally, the "IP without IP" proposition over-counts the markets in which innovation proceeds but the market is allegedly bereft of IP rights or other access barriers. According to typical characterizations, in lieu of the self-interested commercial incentives that purportedly necessitate IP rights and associated barriers to imitation, participants in these sharing environments apparently find sufficient motivation in some mix of intrinsic

⁵² For a similar observation, see Merges, *Economics*, *supra* note 48.

and reputational benefits.⁵³ This observation may be true of certain amateur, artisanal, or academic environments. However, it does not survive closer scrutiny in commercially significant environments. Typically, these weak-IP or zero-IP markets rely on some combination of tax-funded or philanthropic subsidies, some other form of IP rights, or a functional equivalent of IP rights to generate the revenues required to fund innovation activity. This is a simple implication of the “no free lunch” principle of Economics 101. Without IP rights to generate the rents required to cover the fixed costs of innovation and commercialization, innovators, or the holders of innovation assets, must have recourse to other mechanisms to generate rents that will cover production and distribution costs and earn a return that at least equals the next best investment opportunity. Hence, whenever capital requirements pass a significant threshold, any claim that a market somehow supports innovation without IP rights must be scrutinized with extreme caution. In all likelihood, absent tax or philanthropic subsidies, access is being regulated with respect to some point on the relevant innovation asset or some other portion of the aggregate products/services bundle in which that asset is embedded.

1. Subsidies

Some of the markets that generate innovation without the “carrot” of formal IP rights are supported by generous government or philanthropic transfers. For example, literary and musical production in Western Europe prior to the robust implementation of copyright relied primarily on state, church, and private patronage mechanisms.⁵⁴ Capital-intensive but weak-IP innovation environments like university scientific research do not show that individuals and entities will invest effort in innovation without any prospect of financial return. In the U.S., that return is being artificially supplied through billions of dollars in transfers funded by private altruism, tax transfers, and/or government procurement. In 2015, the federal government allocated \$132.25 billion to research and development activities, including activities undertaken directly by government agencies or allocated to public and private research institutions.⁵⁵ Of that amount, \$31.46 billion was allocated to basic research.⁵⁶ The two principal sources of government funding for academic scientific research, the National Institutes for Health and the

⁵³ For the leading sources, see Benkler, *supra* note 8; Benkler, *supra* note 41. See also LESSIG, *FUTURE OF IDEAS*, *supra* note 8; Boyle, *supra* note 8.

⁵⁴ See F.M. SCHERER, *QUARTER NOTES AND BANK NOTES* (2004).

⁵⁵ NAT’L SCI. FOUND., NAT’L CTR. FOR SCI. & ENG’G STATISTICS, *SURVEY OF FED. FUNDS FOR RESEARCH & DEV.*, TABLE 2, *SUMMARY OF FEDERAL OBLIGATIONS AND OUTLAYS FOR RESEARCH, DEVELOPMENT, AND R&D PLANT.*, FYS 2012-15 (2015).

⁵⁶ *Id.*

National Science Foundation, were allocated (by preliminary estimates) \$29.39 billion and \$5.74 billion, respectively.⁵⁷ This is a simple point but surprisingly overlooked in scholarly discussions that sometimes use the example of academic scientific research to dismiss the necessity for IP rights.

2. Other IP

Some of the markets that are typically cited in support of the “IP without IP” proposition make some use of IP rights with respect to some element of the total products/services bundle in which the relevant intellectual good is embedded. This can be illustrated by the fashion industry. It is often stated that the fashion industry operates successfully without robust IP rights.⁵⁸ This is a mischaracterization—the fashion industry operates under a partial IP regime that provides strong protection for trademarks, moderate copyright protection for images, and weak trade dress and copyright protection for stylistic and other design elements. Even formally weak protection for design elements may be stronger than might appear from the “law on the books” since firms with sufficient litigation resources can extract settlements even on the basis of claims that might not be enforceable if fully adjudicated. Consistent with this expectation, textile firms often file lawsuits alleging copyright and trade dress violations by apparel firms.⁵⁹ In the retail segment of the supply chain, branded apparel firms actively enforce their trademarks, which can protect a clothing brand and preserve the firm’s goodwill assets.⁶⁰ The reason is simple: an aesthetically identical handbag without the Gucci mark is not a competitive substitute for the same handbag with the Gucci mark. A simple comparison of the prices paid for authentic and pirated versions of a branded designer handbag (the former bearing the mark and the latter typically not bearing the mark or bearing a distinguishable variant) would demonstrate that proposition.⁶¹ That large price differential supports a basic proposition: so long as the name and logo are protect-

⁵⁷ *Id.*, TABLE 4: FEDERAL OBLIGATIONS AND OUTLAYS FOR RESEARCH AND DEVELOPMENT, BY AGENCY: FYS 2012-15.

⁵⁸ *See, e.g.*, RAUSTIALA & SPRIGMAN, KNOCKOFF ECONOMY, *supra* note 38; Raustiala & Sprigman, *Piracy Paradox*, *supra* note 38.

⁵⁹ *See* Jonathan M. Barnett, Gilles Grolleau and Sana El-Harbi, *The Fashion Lottery: Cooperative Innovation in Stochastic Markets*, 39 J. LEGAL STUD. 159 (2010).

⁶⁰ *See id.*

⁶¹ *See* Boonghee Yoo & Seung-Hee Lee, *Buy Genuine Luxury Fashion Products or Counterfeits?*, in 36 ADVANCES IN CONSUMER RESEARCH 280 (Ann L. McGill & Sharon Shavitt eds., 2009) (noting that “counterfeits’ prices are a mere fraction of genuine items’ prices”).

ed, the innovator can secure a premium on its creative investment even if a large portion of its innovation is left open to imitation by third parties.⁶²

3. IP Equivalents

In some cases, it is true that there is little use of formal IP rights with respect to any portion of the relevant products/services bundle and no subsidies forthcoming from governmental or philanthropic sources. Even in those cases, however, closer scrutiny tends to identify a functional equivalent by which a firm can regulate access and generate the exclusivity premium that can fund its R&D and commercialization investment.

To illustrate, let us return to the example of open-source software. Open-source software, which relies on contributions from volunteer programmers, is released to users at no charge and allows for unlimited copying—usually subject to the condition that any “derivative” applications are distributed under the same terms. Linux, the open-source operating system, has achieved significant penetration in the industrial server market⁶³ (but not, as noted earlier, the consumer PC market)⁶⁴ and would appear to be, and is commonly described as, a phenomenon that casts doubt on the incentive-based justification for IP rights.⁶⁵ But closer scrutiny paints a more complex picture. Survey evidence from 2002 found that roughly half of all open-source programmers were employed or sponsored by for-profit corporations.⁶⁶ As of 2009, approximately 70% of total code contributions to the Linux operating system project—the most successful open-source application—were made by developers employed by for-profit companies.⁶⁷ Elsewhere I have provided detailed evidence showing that Linux and certain

⁶² Elsewhere I and co-authors (see Bamett et al., *supra* note 59) have argued that high-end apparel firms rationally prefer weak IP protection for design elements because it facilitates a collective risk-sharing regime by which apparel firms place “design bids” within a confined range of possible prevailing designs in each season. As we emphasized, however, this does not mean that design firms prefer zero protection (which would eliminate all rents for the prevailing bidder in each seasonal design competition) and does imply (correctly) that high-end firms would pursue infringement actions against lower-end firms that do not incur the costs of placing design bids in the form of design and marketing expenditures.

⁶³ Linux servers represented almost 21% of all server revenue, as of the first quarter of 2012. See David Nagel, *Linux Leads Server Growth*, THE JOURNAL (Jun. 5, 2012), <https://thejournal.com/articles/2012/06/05/linux-based-systems-lead-server-growth.aspx> (citing IDC report).

⁶⁴ See *supra* note 53.

⁶⁵ BENKLER, *supra* note 8; Benkler, *supra* note 41; Boyle, *supra* note 8.

⁶⁶ See Rishab A. Ghosh et al., FLOSS, *Free/Libre and Open Source Software: Survey and Study*, FLOSS (June 2002), http://www.flossproject.org/report/FLOSS_Final4.pdf.

⁶⁷ See Greg Kroah-Hartman et al., The Linux Foundation, *Linux Kernel Development: How Fast It Is Going, Who Is Doing It, What They Are Doing, and Who Is Sponsoring It: An August 2009 Update*, THE LINUX FOUNDATION (Aug. 2009), <http://www.linuxfoundation.org/sites/main/files/publications/whowriteslinux.pdf>.

other leading open-source software projects are substantially governed, funded, and staffed by personnel employed or contributed by for-profit software, hardware, telecom, and other technology firms.⁶⁸ Consistent with standard expectations of economically rational behavior, the “heavy lifting” required to implement a commercially viable technology requires the revenue streams generated by firms that are motivated by standard profit incentives.

The extensive involvement of for-profit firms in some of the most successful open-source software projects is the key to appreciating why this often-cited phenomenon is *not* an example of “IP without IP.” For-profit firms donate extensive personnel and capital to open-source projects because it enables those firms to earn revenue on complementary products and services in which they hold a competitive advantage. Consider IBM: it has reportedly contributed in excess of \$1 billion to the open-source Linux operating system project and maintains hundreds of programmers on staff to maintain and improve Linux.⁶⁹ This apparently altruistic course of action has a rational profit motive. For IBM, a free open-source operating system provides an alternative to the Microsoft Windows operating system in the server market. If users do not have to pay a license fee to Microsoft, then users will prefer, and be willing to pay more for, the hardware on which the free substitute operating system runs.⁷⁰ Not coincidentally, IBM is the leader in the market for server hardware,⁷¹ and its products run on the Linux operating system. Hence, while it is true that Linux is being given away and no programmer is being compensated directly for participating in its development, this apparently cooperative enterprise is funded at least in part because sponsoring for-profit firms can assert exclusivity with respect to some other element of the total products/services bundle in which Linux is embedded. Precisely understood, Linux does not show that IP can be produced without IP; rather, it shows that intellectual assets can be profitably produced by giving away those assets *and* shifting the point at which exclusivity is asserted to some other component of the relevant bundle of products and services.

⁶⁸ See Barnett, *Host's Dilemma*, *supra* note 50, at 1906-13.

⁶⁹ See Barnett, *Illusion of Commons*, *supra* note 13, at 1810-11; Barnett, *Host's Dilemma*, *supra* note 50, at 1910.

⁷⁰ See Barnett, *Illusion of Commons*, *supra* note 13, at 1811; Barnett, *Host's Dilemma*, *supra* note 50, at 1911-12; Ronald J. Mann, *Commercializing Open Source Software: Do Property Rights Still Matter?*, 20 HARV. J.L. & TECH. 1 (2006).

⁷¹ See Chuck Jones, *IBM Regains #1 Server Market Share Position*, FORBES (Aug. 29, 2013, 10:20 AM), <http://www.forbes.com/sites/chuckjones/2013/08/29/ibm-regains-1-server-market-share-position>.

D. A “So What” Objection

This line of argument might raise the following objection. If the market can support innovation without using a full-fledged suite of IP rights, are we not better off without those rights and the associated suite of social costs? Justice Breyer essentially made this argument in 1970 when he argued that the case for copyright was “uneasy” because there were alternative mechanisms for publishers to earn revenues even in the absence of copyright protection.⁷² As a Supreme Court Justice, he repeated the same argument in the landmark copyright infringement case, *MGM v. Grokster*, when he argued that weakened copyright protections for recorded music would not cause significant social harm because artists can earn revenues through live performance.⁷³

This type of argument suffers from a basic oversight. We do not learn much about the necessity of IP rights based merely on the observation that there exist revenue models that can generate funding for innovation in the absence of IP rights (or in the absence of robust IP rights). In particular, this argument repeats the fundamental error embedded in Proposition I: that is, it overlooks the possibility that using non-legal alternatives to IP may exceed the social costs of using formal IP rights to capture returns on innovation. Consider once again open-source software. Assume for simplicity that IBM is successful in inducing complete migration of the server market to the zero-priced Linux platform, with respect to which IP rights have been largely waived. Are server consumers made better off by this effective reduction in IP rights? This is implicitly assumed by most characterizations of open-source software.⁷⁴ But that is not necessarily the case. Obviously users will enjoy drastically reduced costs with respect to the operating system component of the server/OS bundle, which is now available at no charge.⁷⁵ Even in the short term, however, users’ total cost burden may be unchanged or even increased if eliminating a positive fee for the operating system component enables dominant suppliers of server hardware—a remaining proprietary element in the products/services bundle—to profitably raise prices. In the long term, things may be even worse: the zero price for the existing dominant operating system means that any entrant into that

⁷² See Breyer, *supra* note 37, at 351.

⁷³ *Metro-Goldwyn-Mayer Studios Inc. v. Grokster, Ltd.*, 545 U.S. 913, 961-62 (2005) (Breyer, J., concurring).

⁷⁴ See, e.g., Amy Kapczynski, *The Access to Knowledge Mobilization and the New Politics of Intellectual Property*, 117 YALE L.J. 804, 830-31 (2008); Benkler, *supra* note 38, at 446.

⁷⁵ This is a simplification. Users may incur higher implementation and maintenance costs when adopting an open-source software product, which generally is not accompanied by the extensive support features that are offered together with a proprietary software application. Some industry sources claim that total adoption and maintenance costs can sometimes be higher in the case of open-source software applications. See Barnett, *Host's Dilemma*, *supra* note 50, at 1928 n.216.

market can only generate revenue by offering either some other complementary good or service or, if it wishes to charge a positive price for the new operating system, a drastically superior product. The result: the costs of entry into the operating system market are increased relative to a state of affairs in which firms use IP rights to extract returns directly through positive “stand-alone” pricing of the operating system component.

III. PROPOSITION III: IP PROTECTS LARGE INCUMBENT FIRMS

This proposition holds that strong IP rights usually favor large incumbent firms, who lobby for stronger IP in order to extract higher prices from consumers and to erect entry barriers to competitors. By implication, that intuition suggests that the public interest tends to demand weaker IP rights in order to counteract the influence of large concentrated corporate interests that otherwise run roughshod over the poorly represented interests of small dispersed firms and consumers. These intuitions, which animate some recent scholarship and a good deal of popular commentary on IP rights,⁷⁶ have a long history, dating back at least to landmark congressional hearings held in the late 1930s and early 1940s concerning the allegedly dominating influence of patent trusts accumulated by large corporations in a variety of industries.⁷⁷ The result was a multi-decade period extending through the early 1980s in which patent rights were weakened and patent holders had little confidence that patents would be upheld when enforced in infringement litigation.⁷⁸

There is one small problem with this popular (and populist) narrative. The assumption that strong IP necessarily or usually promotes corporate interests does not track the tendencies generally observed in corporate interests’ lobbying and other political-economic behavior relating to IP law.

⁷⁶ See LESSIG, *FREE CULTURE*, *supra* note 8; LESSIG, *FUTURE OF IDEAS*, *supra* note 8; JESSICA LITMAN, *DIGITAL COPYRIGHT* (2001); Boyle, *supra* note 8; James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net?*, 47 DUKE L.J. 87 (1997); Kapczynski, *supra* note 63. This assumption drives much of the arguments in Levine & Boldrin, *supra* note 8, who generally view IP rights as an unjustified monopoly franchise awarded to rent-seeking corporate interests. For representative discussion of academic and activist conferences and organizations that advocate for weaker IP rights in order to protect the “public interest,” see Sean M. Flynn, *The Washington Declaration on Intellectual Property and the Public Interest*, 28 AM. U. INT’L L. REV. 19 (2012).

⁷⁷ For the principal sources, see: (i) POOLING OF PATENTS: APP. TO HEARINGS BEFORE THE COMM. ON PATENTS, HOUSE OF REPRESENTATIVES ON H.R. 4523, 74TH CONG. (1935); (ii) U.S. CONGRESS, TEMPORARY NATIONAL ECONOMIC COMMISSION, INVESTIGATION OF CONCENTRATION OF ECONOMIC POWER: HEARINGS, 75TH–76TH CONG. (1938–1940); and (iii) PATENTS: HEARINGS ON S. 2303 AND S. 2491 BEFORE THE S. COMM. ON PATENTS, 77TH CONG. (1942).

⁷⁸ See 1 DONALD S. CHISUM, *CHISUM ON PATENTS* §OV-9 to §OV-12 (1993). For systematic data that support this observation, see Matthew D. Henry & John L. Turner, *Across Five Eras: Patent Enforcement in the United States 1929–2006* (Working Paper 2013) [hereinafter Henry & Turner, *Five Eras*].

Surprisingly, with the notable exception of the pharmaceutical market, large-firm constituencies in technology markets tend to favor weaker IP rights. This assertion may seem surprising, but data relating to large-firm lobbying behavior clearly demonstrate these tendencies with respect to patent policy since the early 1980s and several historical examples illustrate these tendencies with respect to earlier periods. At least in the short term, some of the largest corporate firms have interests that are largely aligned with the short-term interests of the consumer, who is therefore represented through these well-resourced proxies in judicial and legislative venues. This surprising preference for weak IP rights is anticipated by a dynamic analysis that takes into account both alternative mechanisms for extracting value from innovation assets and firms' differential costs in deploying those mechanisms. Integrated firms have low-cost access to a rich menu of non-IP monetization strategies and therefore have weak demand for IP rights and strategic incentives to resist the expansion of those rights. Those interests, and corresponding policy preferences, are reversed in the case of entities that operate under weakly integrated innovation and commercialization models and do not have cost-comparable access to non-IP monetization strategies.

A. Evidence: Political Influence Investments by IP Constituencies

Evidence on technology firms' investments in political influence supports an approximately inverse correlation between the level of organizational integration and demand for strong IP protections. With the important exception of the pharmaceutical industry (discussed further below), firms that use integrated organizational forms tend to support weaker IP rights, or even oppose them altogether, while firms that use unbundled organizational forms tend to support stronger IP rights. This tendency is especially clear as evidenced by (i) amicus briefs filed in patent litigation since the early 1980s through the present and (ii) lobbying activities in that same period with respect to patent reform in general and software and financial-method patents in particular. This behavior does not seem to be peculiar to the present. In the late-19th century, large U.S. railroad firms lobbied successfully to overturn a judicial doctrine that had resulted in large patent infringement awards.⁷⁹ At New Deal-era congressional hearings, the presidents of industry incumbents such as Bell Labs⁸⁰ and General Motors⁸¹ stated that patents

⁷⁹ See STEVEN W. USSELMAN, REGULATING RAILROAD INNOVATION 144-76 (2002).

⁸⁰ See INVESTIGATION OF CONCENTRATION OF ECONOMIC POWER, HEARINGS BEFORE THE TEMPORARY NAT'L ECON. COMM., U.S. CONG., 75TH CONG. 958 (1939) (statement of Frank Jewett, President of Bell Laboratories, that, as Bell Labs has grown in size, it no longer relies on patents to support R&D).

were not especially important to support R&D and the president of Ford Motor Co.⁸² described how Ford and the automotive industry benefited from relaxed licensing and enforcement of patents. Consistent with the proposed inverse correlation between demand for IP rights and the level of vertical integration, the parts and accessories manufacturers that supplied the automotive industry—equivalent to stand-alone suppliers of upstream inputs—took the opposite position, supporting strong protection for patentees.⁸³

1. Contemporary Patent Reform (Late 1990s-Present)

This correlation between organizational form and the demand for IP rights can account for patterns in contemporary debates over patent reform. With some exceptions, large integrated technology and financial services companies have tended to express positions in support of legislative reforms and judicial decisions that weaken patentees' rights. These reforms include the America Invents Act, enacted in 2011, which (among other things) expanded opportunities to contest the validity of a patent,⁸⁴ and currently proposed reforms that would (among other things) facilitate shifting of attorneys' fees in patent infringement litigation.⁸⁵ Conversely, with some exceptions, large and small firms in the biotechnology and pharmaceutical industry, small firms in the information technology industry, academic research institutions, and individual inventors have tended to oppose those steps.⁸⁶ The same is true of some prominent venture capital firms.⁸⁷ While

⁸¹ See *id.* at 337 (William S. Knudsen, President, Gen. Motors Corp., agreeing with the statement that "the big industries would like to carry on their research without the patent law").

⁸² See INVESTIGATION OF CONCENTRATION OF ECONOMIC POWER, HEARINGS BEFORE THE TEMPORARY NATIONAL ECONOMIC COMMITTEE, U.S. CONG., 75TH CONG. 257-58, 274, 284 (1938) (statement of Edsel Ford, President, Ford Motor Co., describing Ford's zero-royalty open licensing policy and stating that this has operated to benefit of Ford and industry as a whole).

⁸³ GEORGE E. FOLK, PATENTS AND INDUSTRIAL PROGRESS 23, 175-76 (1942). Interestingly, the same dichotomous valuation of patents appears to have prevailed in the steel industry, where evidence collected in the 1950s indicated that large steel companies were not especially dependent on patents while companies that supplied equipment to the steel industry were reliant on patents. See Robert M. Weidenhammer & Irving H. Siegel, *Patent and Other Factors in the Future Organization of the Steel Industry*, 1 PAT., TRADEMARK & COPYRIGHT J. RES. & EDUC. 112, 117 (1957). Again, the demand for IP rights appears to correlate with organizational form: integrated entities exhibit weak demand for, or outright opposition to, IP rights; non-integrated or weakly integrated entities have strong demand for IP rights.

⁸⁴ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

⁸⁵ Innovation Act, H.R. 9, 114th Cong. (2015).

⁸⁶ See Jay P. Kesan & Andres A. Gallo, *The Political Economy of the Patent System*, 87 N.C. L. REV. 1341 (2009). On resistance to patent reform by pharmaceutical and biotechnology companies and support by large internet and other technology companies, see Barney Jopson, *Industry Challenges Tech*

the pharmaceutical industry operates at a high level of vertical integration (and is therefore an exception to the proposed relationship between organizational form and IP policy preferences), its support for strong patents can be explained by the exceptionally large difference between the R&D, testing, and marketing costs borne by a first-mover innovator and the far smaller costs borne by any second-mover entrant. Even though pharmaceutical firms have extensive and difficult-to-replicate production, testing, and marketing assets, the exceptional gap between first-movers' invention and related commercialization costs (estimated at over \$540 million in out-of-pocket costs and over \$1 billion in capitalized costs for a single drug prior to FDA approval),⁸⁸ on the one hand, and second-movers' imitation costs, on the other hand, almost certainly necessitates the use of IP rights to delay entry and secure a sufficient return.

2. Amicus Briefs in Patent Litigation (1982-2015)

Some of the most systematic evidence concerning the relationship between organizational form and IP policy preferences derives from studies of amicus briefs filed in patent litigation. In a striking finding based on amicus briefs filed before the Supreme Court and the Federal Circuit during 1989-2009, Professor Colleen Chien found that amicus briefs filed by public companies—which we would expect to operate under moderate to high levels of vertical integration—favored patentees only 32% of the time.⁸⁹ Based on amicus briefs filed before the Supreme Court during 1982-2009, James Conley and David Orozco found that large firms tend to prefer weaker patent rights while the converse is true of smaller firms.⁹⁰ In related research, Jay Kesan and Andres Gallo examined the expressed IP policy preferences of various constituencies based on each constituency's estimat-

Groups over Patents, FINANCIAL TIMES (Apr. 3, 2014 12:00 AM), <http://www.ft.com/cms/s/0/6bdba76c-bab7-11e3-8b15-00144feabdc0.html>.

⁸⁷ See, e.g., LETTER FROM KLEINER PERKINS CAUFIELD & BYERS ET AL. TO PATRICK J. LEAHY, CHAIRMAN, COMM. ON THE JUDICIARY, AND ARLEN SPECTER, RANKING MEMBER, COMM. ON THE JUDICIARY (Nov. 6, 2007), http://www.patenthawk.com/blog_docs/071106_VC_letter_to_Senators.DOC; Scott Sandell, Commentary, *A Venture Capitalist's Second Thoughts on Patent Reform*, WALL ST. J., May 31, 2015.

⁸⁸ The latter figure takes into account the costs incurred on projects that do not result in a commercially viable product. See Joseph A. DiMasi et al., *The Price of Innovation: New Estimates of Drug Development Costs*, 22 J. HEALTH ECON. 151, 181 (2003).

⁸⁹ See Colleen V. Chien, *Patent Amicus Briefs: What the Courts' Friends Can Teach Us About the Patent System*, 1 U.C. IRVINE L. REV. 397, 421 (2011).

⁹⁰ See David Orozco & James G. Conley, *Friends of the Court: Using Amicus Briefs to Identify Corporate Advocacy Positions in Supreme Court Patent Litigation*, 2011 U. ILL. J.L. TECH. & POL'Y 107, 125-26 (2011).

ed lobbying expenditures on patent and copyright issues.⁹¹ Looking at firms' lobbying behavior specifically with respect to the Patent Reform Bill of 2007, they find that large information technology firms tended to support reforms that weaken patents while large biopharmaceutical firms, small firms in the information technology and biopharmaceutical industries, individual inventors and universities tended to resist those reforms.⁹² While this group may appear to be heterogeneous, all these firm types (other than pharmaceutical firms) share in common a single attribute: they are weakly integrated or stand-alone R&D entities with no or limited commercialization capacities.

To update and supplement these scholars' findings, I collected all amicus briefs filed in Supreme Court cases relating to patent law and in which the decision was issued during January 2008-January 2015. For each brief, I recorded its expressed policy preference based on whether the brief stated that it favored the patentee (or patent applicant), the alleged infringer, or neither party. Based on the description of each brief filer as reflected in its annual report or other publicly available disclosures, I assigned each brief filer (966 in total) to various categories designed to assess preferences based on firm size, entity type, and industry type. In general, the results track previous findings and provide additional detail on filer characteristics and IP policy preferences. As was the case in existing scholarship, the findings are consistent with expectations that large vertically integrated corporations (outside biopharmaceuticals) favor outcomes that weaken patent rights, whereas weakly integrated corporations, such as smaller firms and licensing entities, tend to favor the opposite outcome. The principal results are shown in the Table below.⁹³ Out of all amicus briefs filed during this period, I found that (i) public corporations favored the alleged infringer 61% of the time, the patentee 19% of the time, and neither party in the remaining cases; and (ii) private corporations (which are presumably typically smaller) favored the infringer only 42% of the time, the patentee 41% of the time, and neither party in the remaining cases. If we compare Fortune 500 and non-Fortune 500 companies,⁹⁴ the same tendency is apparent.

⁹¹ The expenditures are estimated based on a methodology that uses data on constituencies' reported total lobbying expenditures and then infers the percentage expended on patent-related issues based on each constituencies' intensity of interest in those issues, as indirectly indicated by the number of patent filings and patent-related reports submitted to congressional committees.

⁹² This is a general description of their results; with respect to specific proposed reforms to the patent statute, the authors sometimes find somewhat more mixed preferences in the case of certain constituencies. For further discussion, see Kesan & Gallo, *supra* note 86.

⁹³ This is a summary description of the results for purposes of this essay-style contribution. In ongoing work, I intend to present these results in more detailed form with more extended analysis.

⁹⁴ "Fortune 500" company refers to any company that appears in the annual list of "Fortune 500" companies, published by Fortune magazine. The list reflects the largest public and private companies that are incorporated and operate in the U.S. based on total revenues for the most recent fiscal year as

While both populations tend to favor the infringer, the larger Fortune 500 entities do so more consistently (exceeded in IP-skeptical sentiment only by university professors).⁹⁵ Most dramatically, I found that academic research entities favored the infringer only 16% of the time, the patentee 75% of the time, and neither party in the remaining cases. This strong preference for the patentee is only exceeded by IP licensing entities, which do so almost all of the time.

**Table I: Amicus Briefs in Supreme Court Patent Litigation
(January 2008-January 2015)⁹⁶**

<u>Entity Type</u>	<u>Favor Patentee</u>	<u>Favor Alleged Infringer</u>	<u>Favor Neither Party</u>
Public corporation	19%	63%	18%
Private corporation	41%	42%	17%
Fortune 500 corporation	14%	69%	17%
Non-Fortune 500 corporation	34%	48%	18%
Universities and other research entities	75%	16%	9%
IP licensing entities	87%	0%	13%
Individual academics (principally law)	18%	74%	8%

These systematic differences in policy preferences across organizational types, as supported by expressed political-economic preferences over more than three decades, are consistent with the proposed correlation between organizational form and IP policy preferences. From an economic

disclosed on publicly filed financial statements. For further description of methodology, see www.fortune.com/fortune500/.

⁹⁵ In other data collected as part of this project, I distinguish among corporations by industry type, finding that pharmaceutical and biotechnology companies show a strong preference in favor of the patentee, as compared to all other industry types. Hence, the moderately strong preference in favor of the patentee shown above would be even more pronounced if pharmaceutical and biotechnology firms were removed.

⁹⁶ Note that “universities” does not include briefs filed by professors, individually or as a group. Percentages may not sometimes add up to exactly 100% due to rounding.

perspective, a university is structurally equivalent to a stand-alone R&D entity that can only feasibly monetize its innovation by entering into contractual relationships with third-party commercialization partners. Without IP rights, those transactions are fraught with expropriation risk as discussed above. Hence, I anticipated, and found, that universities are among the most vigorous supporters of robust patent rights, exceeded only by IP licensing entities. Conversely, a large integrated firm is amply protected by non-IP substitutes and therefore has both reduced demand for IP rights and a strategic incentive to weaken IP rights and thereby raise implicit entry barriers for entities that do not have cost-comparable access to non-IP substitutes. Again, as anticipated, I found that larger firms (outside the biopharmaceutical market) are among the most vigorous opponents of robust patent rights.

3. Case Studies

Two historical episodes involving the expansion of IP rights, and the resistance expressed at the time by large integrated incumbents, further support the proposed correlation between demand for IP rights and organizational form. To be clear, this is not to say that patent protection *should* be made available in these markets. The evidence below is simply presented for purposes of showing which constituencies support or resist these expansions of patent protection, which in turn sheds light on which constituencies are or are not benefited by those expansions.

a. Software Patents

In 1966, a Presidential Commission studied, and recommended against, extending patent protection to software.⁹⁷ IBM and other computer technology firms supported the Commission's position.⁹⁸ In 1968, the Court of Customs and Patent Appeals reversed the PTO's rejection of a patent application for a software application⁹⁹ and rejected any categorical ban on patenting software.¹⁰⁰ However, the PTO continued to resist patent applications for software-related innovations on various statutory

⁹⁷ TO PROMOTE THE PROGRESS OF USEFUL ARTS: REPORT OF THE PRESIDENT'S COMMITTEE ON THE PATENT SYSTEM, S. Doc. No. 5, at 20-21 (1967).

⁹⁸ See Peter S. Menell, *Envisioning Copyright Law's Digital Future*, 46 N.Y.L. SCH. L. REV. 63, 75 (2003).

⁹⁹ See *Application of Prater and Wei*, 415 F.2d 1378 (C.C.P.A. 1968); see also U.S. Patent No. 3,380,029 (issued Apr. 23, 1968) for the patent.

¹⁰⁰ *In re Prater and Wei*, 162 U.S.P.Q. 541, 549 n.29 (CCPA 1969).

grounds.¹⁰¹ In the 1970s, the Supreme Court tackled the patentability of software in three cases: *Gottschalk v. Benson* (1972),¹⁰² *Dann v. Johnston* (1976),¹⁰³ and *Parker v. Flook* (1978).¹⁰⁴ As observed through amicus briefs filed in these litigations,¹⁰⁵ integrated computer equipment manufacturers generally opposed the extension of patent protection to software programs. By contrast, specialized software providers, and trade associations representing specialized software providers, generally supported this extension. In *Gottschalk v. Benson*, integrated computer manufacturers (or associations representing computer manufacturers) submitted briefs against the extension of patent protection,¹⁰⁶ while an assortment of independent software providers and data processing firms submitted briefs in favor.¹⁰⁷ While there were fewer amicus briefs submitted in *Dann v. Johnston* and *Parker v. Flook*, hardware manufacturers in those cases similarly opposed judicial rulings that would extend patent protection to software while a similar assortment of independent software providers and data processing firms supported such extension.¹⁰⁸

¹⁰¹ See Howard R. Popper, *Prater II*, 19 AMER. UNIV. L. REV. 25 (1970) for a contemporary account.

¹⁰² *Gottschalk v. Benson*, 409 U.S. 63 (1972).

¹⁰³ *Dann v. Johnston*, 425 U.S. 219 (1976).

¹⁰⁴ *Parker v. Flook*, 437 U.S. 584 (1978).

¹⁰⁵ All briefs were sourced through the Westlaw database. I ignored bar associations, which supported patentees without exception.

¹⁰⁶ Brief for Burroughs Corporation as Amicus Curiae Supporting Petitioner, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136232; Brief Amicus Curiae on Behalf of the Business Equipment Manufacturers Association, *Gottschalk*, 409 U.S. 62 (No. 71-485), 1972 WL 136229; Brief Amicus Curiae for Honeywell Inc., *Gottschalk*, 409 U.S. 62 (No. 71-485), 1972 WL 136234; Brief for Amicus Curiae International Business Machines Corporation, *Gottschalk*, 409 U.S. 62 (No. 71-485), 1972 WL 136233. At the time, these firms were primarily hardware manufacturers.

¹⁰⁷ Briefs from independent software vendors included Brief for Applied Data Research, Inc. (ADR) as Amicus Curiae Supporting Respondents, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136227; Motion for Leave to File Brief Amici Curiae and Brief for Computer Software Analysts, Inc. and Computer Lists Corp. as Amicus Curiae, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136561; Motion for Leave to File Brief Amicus Curiae and Brief for the Information Industry Association as Amicus Curiae Supporting Petitioner, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136235; Brief for Whitlow Computer Systems, Inc. as Amicus Curiae, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136230. Other pro-patentee briefs included Brief for the Association of Data Processing Service Organizations, Software Products and Service Section (Adapso/Aise) as Amicus Curiae Supporting Respondents, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 137530; Brief for Institutional Networks Corporation as Amicus Curiae, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1972 WL 136231; Brief for Mobil Oil Corporation as Amicus Curiae, *Gottschalk*, 409 U.S. 63 (No. 71-485), 1971 WL 134300. The appearance of Mobil Oil Corp., an integrated manufacturer, among the group of pro-patentee filers may seem anomalous; however, it is probably explained by the fact that Mobil Oil was issued the first patent for a software program, as discussed above.

¹⁰⁸ "Pro-patentee" amicus briefs filed in the *Dann* case included: Brief for Applied Data Research, Inc. (ADR) as Amicus Curiae Supporting Respondent, *Dann*, 425 U.S. 219 (No. 74-1033), 1975 WL 173471; Brief for the Association of Data Processing Service Organizations, Software Industry Association (ADAPSO SIA) as Amicus Curiae Supporting Respondent, *Dann*, 425 U.S. 219 (No. 74-1033),

Differences in firms' expressed preferences for or against software patents in the 1960s and 1970s, as illustrated by the views expressed in the amicus briefs filed in the aforementioned litigations, can be logically derived from any particular firm's level of integration. Until antitrust action by federal prosecutors against IBM during the late 1960s, leading computer manufacturers typically bundled software as an unpriced component of a larger hardware product and therefore had no need for patent protection (and, strategically, had reasons to oppose it in order to frustrate entry by stand-alone software providers). IBM took the view that software programs were not patentable and declined to assert copyright in its software programs.¹⁰⁹ IBM's bundling strategy—and accompanying lobbying strategy—enabled it to earn a return on software development in the absence of IP rights, but had an adverse effect on the ability of independent software providers to do so. As the recipient of what is considered to be the first software patent explains: “Back in the 1960s . . . computer companies were giving away their software when they sold the computer . . . [S]elling against free software is difficult. That’s the reason I tried to get a patent.”¹¹⁰ Without patent protection (and, at the time, uncertain copyright protection),¹¹¹ software providers principally supplied customized software programs to corporate customers on a contract basis¹¹² or, as a contemporary

1975 WL 173472; Brief for Software Associates, Inc. as Amicus Curiae, *Dann*, 425 U.S. 219 (No. 74-1033), 1975 WL 173470; Brief for Universal Software, Inc. as Amicus Curiae, *Dann*, 425 U.S. 219 (No. 74-1033), 1975 WL 173467. “Pro-patentee” amicus briefs filed in the *Parker* case included: Brief for Applied Data Research, Inc. (ADR) as Amicus Curiae Supporting Respondent, *Parker*, 437 U.S. 584 (No. 77-642), 1977 WL 189333; Brief for the Association of Data Processing Service Organizations (ADAPSO) as Amicus Curiae Supporting Respondent, *Parker*, 437 U.S. 584 (No. 77-642), 1978 WL 206643; Brief for Mobil Oil Corporation as Amicus Curiae, *Parker*, 437 U.S. 584 (No. 77-642), 1978 WL 206640; Brief for Software Associates, Inc. as Amicus Curiae, *Parker*, 437 U.S. 584 (No. 77-642), 1978 WL 206641. “Anti-patentee” amicus briefs filed in the *Dann* and *Parker* cases included, respectively: Brief for the Computer & Business Equipment Manufacturers Association (CBEMA) as Amicus Curiae Supporting Petitioner, *Dann*, 425 U.S. 219 (No. 74-1033), 1975 WL 173466; Brief for the Computer & Business Equipment Manufacturers Association (CBEMA) as Amicus Curiae, *Parker*, 437 U.S. 584 (No. 77-642), 1978 WL 206639.

¹⁰⁹ See Martin Campbell-Kelly, *Not All Bad: An Historical Perspective on Software Patents*, 11 MICH. TELECOMM. & TECH. L. REV. 191, 210 (2005).

¹¹⁰ See Charles Arthur, *Software Patents ‘a Bit of a Mess’ Says Martin Goetz, the First Man to Get One*, THE GUARDIAN, (Jan. 24, 2013, 13:22), <http://www.theguardian.com/technology/2013/jan/24/smartphone-patent-wars-intellectual-property>.

¹¹¹ During the 1960s and 1970s, it had not yet been resolved whether software could be protected under copyright, given misgivings about whether doing so would run afoul of copyright’s exclusion of “ideas” from eligible subject matter, as distinguished from expression. These doubts were largely resolved by the Copyright Act of 1976, which specifically designated software as copyrightable subject matter. See generally Copyright Act of 1976, Pub. L. No. 94-553, 90 Stat. 2541. Additionally, in *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1247–49 (3d Cir. 1983), an influential court resolved doubts concerning whether copyright could protect operating system code.

¹¹² See FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGY USES OF COPYRIGHTED WORKS, 79-80 (1978).

observer noted, tended to merge with larger firms that could supply internal financing and distribution capacities.¹¹³ With the advent of patent protection (and, by the late 1970s, copyright protection), software providers had greater ability to invest resources in assembling prepackaged software that could be distributed to a mass market without undue fear of unauthorized replication.¹¹⁴ IBM and its peers were successful in deferring the extension of patent protection to software until a 1981 Supreme Court decision that ruled otherwise.¹¹⁵

b. Financial Method Patents

In 1998, the Federal Circuit issued a decision upholding the patentability of business methods, overturning a widespread understanding that business methods were not eligible for patent protection.¹¹⁶ The conventional proposition concerning the political economy of IP rights would expect that the financial services industry would be eager to earn additional rents through a state-granted monopoly right. Just the opposite is true: the financial services industry vigorously opposed the extension of IP rights to financial innovations. The reason can be derived from the fact that financial services firms earn returns on innovation through a combination of non-IP capacities, including lead-time advantage, branding, and a suite of difficult-to-replicate advisory, marketing, and execution capacities.¹¹⁷ The incumbents' comparative advantages in non-IP assets provided a strategic reason to oppose the introduction of IP rights, which creates both an entry opportunity for younger, smaller, and less integrated firms and a litigation opportunity for patent holders that lack any operational capacities. Consistent with that rationale, the financial services industry successfully lobbied against business method patents, rapidly securing legislative amendments that instituted a prior user defense in patent infringement litigation involv-

¹¹³ See Peter Hall et al., *The American Computer Software Industry: Economic Development Prospects*, in *SILICON LANDSCAPES* 53 (1985).

¹¹⁴ I am not suggesting that these changes in industrial structure were principally the result of changes in IP protection; rather, those changes facilitated a change in industrial structure that arose due to other causes. The key cause was most likely the improved efficiency of computing technology, and the resulting expansion of the personal and small-business computer market, which generated sufficient demand to elicit investment by software providers in developing programs that could be sold on a mass scale, rather than through one-off customer-specific transactions. See Campbell-Kelly, *supra* note 109, at 211.

¹¹⁵ See *Diamond v. Diehr*, 450 U.S. 175, 185–86 (1981).

¹¹⁶ See *State St. Bank & Trust Co. v. Signature Fin. Grp., Inc.*, 149 F.3d 1368, 1375–77 (Fed. Cir. 1998).

¹¹⁷ See Peter Tufano, *Financial Innovation*, in 1A *HANDBOOK OF THE ECONOMICS OF FINANCE* 307, 324–27 (George M. Constantinides et al. eds., 2003); Peter Tufano, *Financial Innovation and First-Mover Advantages*, 25 J. FIN. ECON. 213, 234–35 (1989).

ing business method patents (enacted by Congress in 1999)¹¹⁸ and a “second look” review for applications for these types of patents (adopted by the PTO in 2000).¹¹⁹ In 2008, the Federal Circuit issued a decision that limited the patentability of business method patents,¹²⁰ and, in 2014, the Supreme Court issued its landmark decision in *Alice Corp. v. CLS Bank International*,¹²¹ which has cast significant doubt on the patentability of business method patents in general. Consistent with its past policy preferences, the financial services industry filed amicus briefs in both litigations supporting the alleged infringer and arguing against the patentability of business methods.¹²²

4. Is Copyright Different?

It might be thought that the content industries, like the pharmaceutical industry, are an exception to the tendency of large integrated firms to prefer weaker IP rights. Clearly the dominant content holders in creative and media markets usually lobby for stronger copyright protections and tend to defend those protections zealously in court.¹²³ Closer consideration of the content industries allows for a more precise and general formulation of the relationship between the demand for IP rights and organizational form, which can account for observed tendencies in firm-specific preferences for stronger or weaker IP rights in both technology and content markets. In both markets, differences in revenue-generation models tend to be associated with differences in IP policy preferences. Firms tend to favor stronger

¹¹⁸ American Inventors Protection Act of 1999, Pub. L. 106-113, 113 Stat. 1501 (1999).

¹¹⁹ U.S. PATENT & TRADEMARK OFFICE, A USPTO WHITE PAPER: AUTOMATED FINANCIAL OR MANAGEMENT DATA PROCESSING METHODS (BUSINESS METHODS) (2000).

¹²⁰ *In re Bilski v. Kappos*, 545 F.3d 943, 1015 (Fed. Cir. 2008), *aff'd*, 561 U.S. 593 (2010).

¹²¹ *See Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2349-50 (2014).

¹²² *See* Brief for Bank of America Corp. & Barclays Capital Inc., et al. as Amici Curiae Supporting Respondents, *Bilski v. Kappos*, 561 U.S. 593 (2010) (No. 08-964), 2009 WL 3199628; Brief of the Clearing House Ass'n & Fin. Servs. Roundtable as Amici Curiae Supporting Respondents, *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014) (No. 13-298), 2014 WL 880953. According to the brief filed in the *Alice* case, the Financial Services Roundtable represents 100 financial services companies and the Clearing House Association is the oldest banking association in the United States and “clears more than \$2 trillion per day across its networks”. *See id.*, at v.

¹²³ I intentionally say “usually,” rather than “always.” When large media firms are net users of content assets, they adopt an IP-hostile position. For example, in the recent Supreme Court decision, *Petrella v. Metro-Goldwyn-Mayer*, 134 S. Ct. 1662 (2014), the film studio advanced a position (arguing for a strict interpretation of the statute of limitations under the Copyright Act) that would make it more difficult for copyright holders to pursue infringement claims. Similarly, in *Aalmuhammed v. Lee*, 202 F.3d 1227 (9th Cir. 2000), a film studio successfully argued for a standard that makes it harder for individuals to assert copyright infringement claims with respect to material purportedly contributed to a larger creative production. In both cases, the large media firm is subject to the hold-up risk that motivates large technology firms to oppose strong applications of IP rights with greater consistency.

IP when they derive revenues principally from the stand-alone or “unbundled” sale of intellectual assets, which will tend to characterize unintegrated or weakly-integrated entities. By contrast, firms favor weaker IP when they derive revenues principally from a complementary or “bundled” suite of goods or services, which will tend to characterize substantially integrated entities.

a. Unbundled Revenue Models Favor Stronger IP

Despite differences in size, a large media entity such as a Hollywood studio is structurally analogous in certain respects to an upstream R&D supplier in a technology market. Both entities use unbundled (or substantially unbundled)¹²⁴ models for capturing returns from intellectual assets—content assets delivered to end-users in the former case and technology assets delivered to intermediate users in the latter case. Neither a film studio nor a chip design firm can expect to remain viable in its current stand-alone organizational form if it were to give away the intellectual assets it sourced, produced, and marketed at significant cost and risk. Hence, a content production firm such as a movie studio, record label, or television network consistently advocates for (and generally seeks to enforce) the highest levels of copyright protection, which maximizes the menu of financing and distribution models from which it can select in extracting revenue from its creative portfolio.¹²⁵ This is not to say that these entities would necessarily exit or reduce investment in these markets without IP protections; however, they would be compelled to adopt a bundled structure that generates revenue through a complementary set of goods and services. This can be observed in the recorded music market, which, in response to dramatic declines in sales revenues as a result (in part) of unauthorized consumption, adopted “360” deal structures in which the record label receives a percentage of the artist’s revenues earned from live performance, a complementary

¹²⁴ I say “substantially unbundled” because a content firm such as a film studio is today typically a subsidiary of a larger parent firm that has extensive commercialization capacities. Nonetheless, the studio’s business model still relies on extracting revenue directly from content assets that are distributed directly and on a “stand-alone” basis to target consumers.

¹²⁵ Note that this does *not* mean that the copyright holder will always impose the most onerous access restrictions and pricing levels with respect to its copyright-protected assets. Rather, maximal copyright protection provides the copyright holder with maximal freedom to select the profit-maximizing combination of pricing and access regulations. In some cases, as discussed above, that might even recommend fully or partially giving away the asset and earning revenue on a complementary good.

(and inherently excludable) good that the record label had previously forfeited to the artist.¹²⁶

b. Bundled Revenue Models Favor Weaker IP

An online distribution or search intermediary, such as Google, generates revenues indirectly through complementary products and services. Specifically, Google indirectly extracts revenue from its zero-priced search services through an associated suite of complementary assets that are difficult for others to replicate (primarily, data-collection and targeted advertising services associated with Google search engines, which employ algorithms and other technical features that may be difficult to reverse-engineer). This two-sided structure enables Google to earn revenues from advertising clients on the “pay” side while users enjoy access to a rich pool of informational assets (search results, traffic information, YouTube videos) on the “free” side.¹²⁷ This is not a new model in the content market: broadcast television and terrestrial radio stations have always operated by giving away content to viewers and listeners, respectively, while earning revenues by selling advertising services to businesses.¹²⁸ Not coincidentally, both Google’s and the television and radio stations’ business model is structurally analogous to IBM’s strategy in the server market, in which it extracts revenue from the sale of proprietary hardware and associated services, while the associated informational asset (the Linux operating system) is provided at no cost to users.¹²⁹

As a bundled content intermediary, Google benefits from reductions in the strength of copyright for two reasons.

First, reducing copyright strength reduces Google’s exposure to direct and indirect copyright infringement claims from content suppliers and hence, reduces the price it must implicitly pay for enabling users to make unauthorized use of that content or, in some cases, engaging in the practice itself. This is literally the case whenever Google prevails in copyright infringement litigation brought by media companies, as was the case in the 2013 litigation victory by YouTube (a Google subsidiary) over Viacom and

¹²⁶ See Sara Karubian, *360° Deals: An Industry Reaction to the Devaluation of Recorded Music*, 18 S. CAL. INTERDISC. L.J. 395 (2009). On performance-based revenue models in the music industry, see Barnett, *Copyright Without Creators*, *supra* note 16, at 45-48.

¹²⁷ To be precise, users’ access is not entirely “free” since users typically forfeit, whether explicitly or implicitly, access to some of their personal data, a commercially valuable asset.

¹²⁸ It should be noted that Google’s (and other digital search services’) giveaway model is more extreme in two respects: (i) it disseminates content over which the distribution intermediary has often not secured a license from the content holder; and (ii) users are able to replicate and re-transmit that content at low cost and high quality.

¹²⁹ See *supra* notes 69-71.

other content holders,¹³⁰ thereby avoiding both copyright infringement damages and licensing fees going forward. From an economic perspective, those legal decisions reduce the input costs borne by Google, and since Google is an overwhelming net user of content, they increase its total net profits from the sale of advertising services. That business rationale explains why Google, and other advertising-based search services, vigorously promoted public opposition to the proposed Stop Online Piracy Act (“SOPA”), which would have elevated the penalties to which websites could be subject for engaging in or facilitating online infringement of copyright-protected material.¹³¹

Second, reducing copyright strength reduces users’ copyright infringement liability and hence, the implicit price that users must pay to access and distribute content through Google’s services. That in turn makes the search engine more attractive, increases the number of users, and ultimately increases the rates that Google can charge for its core complementary asset—namely, advertising services. Consistent with this proposition, Google has not only expended significant efforts in lobbying against expanded copyright protections, but has undertaken unilateral self-help actions that effectively weaken copyright protection on a mass scale. For example, the Google Books project digitized millions of books held by university libraries and, even when the owner of the copyright of an out-of-print (but still in-copyright) book could not be located, made excerpts (or “snippets”) of those books available online without securing the owner’s consent. Absent a fair use defense, the first step (digitization) was clearly a violation of copyright and the second step (snippet display) was almost certainly a violation.¹³² Litigation over those questions, in cases such as *Authors Guild, Inc. v. Google Inc.* and *Authors Guild, Inc. v. HathiTrust*,¹³³ has provided an opportunity for Google to successfully expand the fair use defense to a significant range of content digitization and search activities, thereby escaping liability in those cases and securing a precedent that pro-

¹³⁰ See *Viacom Int’l Inc. v. YouTube, Inc.*, 940 F. Supp. 2d 110 (S.D.N.Y. 2013).

¹³¹ See Declan McCullagh & Greg Sandoval, *Google Will Protest SOPA Using Popular Home Page*, CNET (Jan. 17, 2012, 8:57 AM), <http://www.cnet.com/news/google-will-protest-sopa-using-popular-home-page/>.

¹³² I say “almost certainly” because, in limited circumstances, some courts have recognized a *de minimis* defense to copyright infringement. Compare *Newton v. Diamond*, 388 F.3d 1189 (9th Cir. 2003) (recognizing *de minimis* defense with respect to infringement of the performance right in a musical composition) with *Bridgeport Music, Inc. v. Dimension Films*, 410 F.3d 792 (6th Cir. 2005) (rejecting *de minimis* defense with respect to infringement of the reproduction right in a sound recording).

¹³³ *Authors Guild Inc. v. Google Inc.* (2d Cir. 2015); *Authors Guild, Inc. v. HathiTrust*, 755 F.3d 87 (2d Cir. 2014). Note that only the former litigation involved snippet display practices.

vides Google (and other digital search services) with the freedom to engage in future content giveaway strategies.¹³⁴

CONCLUSION

Current trends in IP scholarship and the broader intellectual climate as expressed by courts, policymakers, and the popular press, tend to express skepticism toward the necessity of IP rights or at least, robust versions of those rights. That view is grounded in a medley of three underlying propositions: (i) IP rights increase costs to users and raise entry barriers; (ii) innovation often proceeds without IP; and (iii) IP rights tend to protect incumbents. Closer examination shows that these propositions generate false predictions over a significant range of circumstances. The effects of changes in the strength of IP rights cannot be assessed without taking into account both (i) the potent non-IP mechanisms that firms may deploy to capture value from innovation investments and (ii) entity-specific differences in the costs of accessing those alternative mechanisms. To be clear, taking into account these mechanisms (and differential access to those mechanisms) does not recommend robust versions of IP rights across the board. Some or even all recent and proposed reductions in the strength of the patent regime (and expansions of the fair use defense under copyright law) may meet at least a reasonableness threshold under this alternative analytical framework. At a minimum, however, this dynamic approach toward analyzing changes in IP rights urges caution in any significant movement away from robust IP protection. In an important set of circumstances, reducing IP rights can increase costs for users while raising entry barriers for firms that adopt weakly integrated and other unbundled business models for implementing the innovation and commercialization process. The result is perverse: weaker IP rights may raise entry costs, increase concentration, and ultimately raise prices, limit output, or otherwise distort innovation investments. This concern finds support in reasonably systematic differences in both organizational behavior under stronger and weaker IP regimes and IP policy preferences across more and less integrated entities in innovation markets. This nuanced if more complex analytical framework provides a sounder basis for informed discussions over the future direction of IP rights in innovation markets.

¹³⁴ This is not intended to mean that the court's expansions of the fair use defense in these decisions were incorrect; rather, I am simply observing why reduced copyright operates to Google's business advantage, which may or may not coincide with the public interest.

**Appendix: Supreme Court Decisions Relating to Patent Law
(January 2008 - January 2015)**

<u>CASE</u>	<u>OUTCOME</u> <u>(P,D,N)</u> ¹³⁵	<u>VOTE</u>
<i>Quanta Computer, Inc. v. LG Electronics, Inc.</i> , 553 U.S. 617 (2008)	D	9-0
<i>Bilski v. Kappos</i> , 561 U.S. 593 (2010)	D	9-0
<i>Global-Tech Appliances, Inc. v. SEB S.S.</i> , 131 S. Ct. 2060 (2011)	D	8-1
<i>Board of Trustees of Stanford Univ. v. Roche Molecular Systems</i> , 131 S. Ct. 2188 (2011)	N	7-2
<i>Microsoft Corp., v. i4i Ltd. P'ship</i> , 131 S. Ct. 2238 (2011)	D	9-0
<i>Mayo Collaborative Servs. v. Prometheus Labs, Inc.</i> , 132 S. Ct. 1289 (2012)	D	9-0
<i>Caraco Pharm. Labs., Ltd. v. Novo Nordisk A/S</i> , 132 S. Ct. 1670 (2012)	D	9-0
<i>Kappos v. Hyatt</i> , 132 S. Ct. 1690 (2012)	P	9-0
<i>Gunn v. Minton</i> , 133 S. Ct. 1059 (2013)	N	9-0
<i>Bowman v. Monsanto Co.</i> , 133 S. Ct. 1761 (2013)	P	9-0

¹³⁵ “P” means the decision results in an interpretation of the law that tends to favor plaintiffs in patent infringement suits (even if the plaintiff may not have prevailed in that particular suit). “D” means the decision results in an interpretation of the law that tends to favor defendants in patent infringement suits (even if the defendant may not have prevailed in that particular suit). “N” means the decision resulted in an interpretation of the law that does not clearly favor plaintiffs or defendants in patent infringement litigation.

<u>CASE</u>	<u>OUTCOME</u> <u>(P,D,N)</u> ¹³⁶	<u>VOTE</u>
<i>Ass'n for Molecular Pathology v. Myriad Genetics, Inc.</i> , 133 S. Ct. 2107 (2013)	D	9-0
<i>FTC v. Actavis, Inc.</i> , 133 S. Ct. 2223 (2013)	D	5-3
<i>Medtronic, Inc. v. Mirowski Family Ventures, LLC</i> , 134 S.Ct. 843 (2014)	D	9-0
<i>Highmark Inc. v. Allcare Health Mgmt. Sys.</i> , 134 S. Ct. 1744 (2014)	D	9-0
<i>Limelight Networks, Inc. v. Akamai Techns., Inc.</i> , 134 S. Ct. 2111 (2014)	D	9-0
<i>Nautilus, Inc. v. Biosig Instruments, Inc.</i> , 134 S. Ct. 2120 (2014)	D	9-0
<i>Alice Corp. Pty. Ltd. v. CLS Bank Int'l</i> , 134 S. Ct. 2347 (2014)	D	9-0
<i>Teva Pharm. USA, Inc. v. Sandoz, Inc.</i> , 135 S. Ct. 831 (2015)	N	7-2

¹³⁶ “P” means the decision results in an interpretation of the law that tends to favor plaintiffs in patent infringement suits (even if the plaintiff may not have prevailed in that particular suit). “D” means the decision results in an interpretation of the law that tends to favor defendants in patent infringement suits (even if the defendant may not have prevailed in that particular suit). “N” means the decision resulted in an interpretation of the law that does not clearly favor plaintiffs or defendants in patent infringement litigation.

