

POLICY MEMO

How IP Rights Keep Markets Free

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Executive Summary

It is elementary that secure protection of property rights is a necessary precondition for efficient markets that drive economic growth. Yet this principle is not always recognized in the case of markets for intangible goods. Rather, *intellectual* property rights are often characterized as a monopoly franchise that stands at odds with free-market competition. Following this view, IP rights at best provide a justifiable means to incentivize innovation but are prone to abuse by incumbents seeking to block entrants.

This standard narrative overlooks an inconvenient fact. As I show in a new book, *Innovators, Firms, and Markets: The Organizational Logic of Intellectual Property*, incumbents and other large firms in US technology markets have regularly advocated *against* stronger forms of patent protection and, in certain industries, have resisted patent protection entirely. This lobbying strategy poses a puzzle: Why would dominant firms resist the opportunity to operate under the umbrella of a legal monopoly?

This policy memo analyzes the counterintuitive IP policy preferences of large technology firms and, in resolving this apparent anomaly, shows that patents tend to enhance competitive intensity by enabling idea-rich but capital-poor innovators to challenge idea-poor but capital-rich incumbents. Contrary to widespread assumptions, IP rights are far closer to the familiar property rights that support tangible goods markets rather than the monopoly grant to which they are often (and misleadingly) analogized. These insights, which are based on over a century's worth of US innovation history, raise significant concerns about the IP-skeptical trajectory that policymakers have pursued since the mid-2000s.

The Surprising Political Economy of the US Patent System

US patent and antitrust history, from late nineteenth-century railroads through twenty-first-century search engines, shows that, outside pharmaceuticals, large firms, and especially large firms that operate through integrated structures,

Table 1: Amicus Briefs Filed in Patent-Related Supreme Court Cases (2006-2016)

FILER TYPE	FAVORING PATENTEE	FAVORING ACCUSED INFRINGER	FAVORING NEITHER PARTY
All business entities	30%	56%	14%
Fortune 500 firms	21%	65%	14%
Financial services (excl. venture capital)	11%	81%	9%
Information and communications technology	10%	75%	15%
ICT – platforms	1.3%	87%	12%
ICT – semiconductors	21%	72%	8%
Biopharmaceutical	75%	19%	6%
Academic technology transfer	96%	1%	2%
Venture capital	100%	0%	0%

Source: This figure is reproduced by permission of Oxford University Press. For full version, see Jonathan M. Barnett, *Innovators, Firms, and Markets: The Organizational Logic of Intellectual Property*, 147, table 7.2 (Oxford University Press 2021), which describes sources and methodology. Note: Percentages in each row do not always add up to 100 due to rounding.

tend to advocate for weaker patent protection or do not resist significant reductions in patent protection. Integrated structures can take two main forms. A firm is vertically integrated when it undertakes production, distribution, and other steps required to deliver an innovation to market. A firm is systems-integrated when it embeds innovations within a complex bundle of related products and services. The former structure is common in traditional manufacturing and other brick and mortar industries; the latter structure is common in digital platform markets.

In the late nineteenth century, the country's largest railroads led a successful campaign to limit the damages awarded to patent owners in infringement litigation.¹ From the 1940s through the 1960s, the widespread use of compulsory patent licensing orders by the Department of Justice against some of the country's largest firms elicited little resistance. However, in the 1960s and 1970s, IBM, then the world's

largest computer company, vigorously advocated against patent protection for software.² In the 2000s, most leading technology firms were also leading proponents of "patent reform," resulting in the America Invents Act of 2011, which enables any third party to challenge the validity of issued patents. Since passage of the act, some of those same firms are the top filers of petitions to invalidate patents at the Patent Trial and Appeals Board, a strategy they have pursued with much success.³

To reflect current IP policy preferences in the innovation economy, the following table indicates the percentage of amicus briefs filed by various types of entities in patent-related Supreme Court cases from 2006-2016. As can be seen, business entities in general tend to favor the alleged infringer. This tendency is stronger in the case of Fortune 500 companies and even stronger in the case of the information technology and financial services industries (excluding venture

capital), although a significant portion of the semiconductor industry expressed support for patentees. Research institutions, venture capitalists, and biopharmaceutical firms favored patentees in all or most amicus briefs.

Why IP Rights Can Lower Entry Barriers and Increase Competitive Intensity

The political economy of the patent system seems to follow a counterintuitive tendency. Other than biopharmaceuticals, larger firms generally prefer weaker patents while the opposite is the case for venture capitalists and research institutions that transfer technology through licensing and other IP-dependent transactions. This raises a conundrum: Why would profit-motivated firms seek to weaken a legal tool that could be used to widen the “moat” that blocks competitors?

To resolve this puzzle, it is necessary to appreciate that a firm can deploy a range of strategies to erect entry barriers and capture a return on its innovative efforts. Some of those strategies rely on IP rights but some do not.

Consider Coca-Cola: It has maintained the secrecy of its product formula since 1886 and therefore does not require a formal IP right to capture returns on innovation. But Coca-Cola is only the tip of the iceberg. In a wide range of cases, a firm can capture returns on innovation without IP rights so long as it has financing, production, or distribution efficiencies that are difficult for other firms to replicate. In digital markets, a firm like Apple or Facebook that has developed an established platform with a loyal user base and an integrated suite of applications can similarly capture returns on innovations by incorporating them into its product ecosystem. In all these cases, dominant firms are not only largely indifferent to IP rights but may prefer weaker IP rights to impede entrants that lack significant non-IP assets and therefore require IP rights to pose a competitive threat.

This line of argument suggests that the demand for IP rights not only varies among different types of firms but does so

systematically. Firms that maintain integrated structures for converting innovations into commercially viable products and services will have weaker demand for IP rights or have strategic reasons to resist them. By contrast, upstream firms that specialize in research and development must partner with downstream firms that specialize in manufacturing, distribution, and other tasks required to convert innovations into products or services for consumers. These interactions often require that the innovator disclose part of its technology and consequently raise the risk that its technology will be used without compensation. Without secure IP rights to mitigate this risk, these symbiotic relationships may not be feasible, and the upstream innovator will have no commercially practicable path to market.

To illustrate this point, consider two hypothetical firms: Incumbent, an established auto manufacturer with a production and distribution infrastructure, and Startup, a small firm that has developed a new sensor mechanism for automated driving but lacks the capital and expertise to produce and distribute its innovation on commercially viable terms.

In an environment without robust IP rights, Startup runs into a roadblock. If it approaches Incumbent to discuss integrating its innovation into Incumbent’s vehicles and to negotiate the terms of that relationship, Startup will be compelled to demonstrate its innovation for Incumbent’s engineers, who may be able to copy it. Without IP rights, Startup cannot securely monetize its innovation by partnering with firms that maintain the larger product system to which the innovation would add value.

None of this is true of Incumbent. Suppose Incumbent’s engineers develop a new sensor mechanism, which it then incorporates into its vehicles. Assuming Incumbent’s direct competitors cannot rapidly “tear down” the vehicle, reverse-engineer the new component, and reproduce it at the same cost and quality, Incumbent can capture returns

on the innovation through vehicle sales in the retail market. Hence, Incumbent is indifferent to IP protection or may prefer weaker IP rights, either to impede entry by Startup or to gain leverage in licensing or acquisition negotiations with Startup.

Unconventional Lessons for IP and Antitrust Policy

This hypothetical example illustrates two unconventional policy lessons.

Lesson 1: Contrary to conventional arguments for robust IP rights, patents are not always a precondition for innovation. Larger integrated firms like Incumbent can often monetize innovations by embedding them in complex product and service bundles, or production and distribution infrastructures, that are difficult for other competitors to imitate. If these integration strategies cannot adequately deter imitation, then even Incumbent will prefer stronger IP rights, as is the case in the biopharmaceutical industry.

This explains why large firms in the decades following World War II raised little resistance to the compulsory licensing orders deployed by antitrust enforcers. In 1956, the consent decree that ended the government's antitrust lawsuit against AT&T required AT&T to license nearly all its existing patents on a royalty-free basis and future patents on a reasonable royalty basis. Yet AT&T's existing licensing policy already was to share its crown-jewel transistor technology, together with know-how, for a modest fee, with all interested parties. Given the ability of large firms like AT&T to monetize innovations through integrated production and distribution infrastructures that few other firms could match, the compulsory licensing orders did not threaten their market leadership. This also explains why robust innovation can sometimes persist in industries that lack meaningful IP protection or during periods, such as the decades following World War II, when it was difficult to enforce patents against infringers.

Lesson 2: Contrary to conventional arguments against robust IP rights, patents often *are* a precondition for innovation by firms that specialize in R&D but lack capacities to perform other functions in the supply chain, such as manufacturing or distribution, that are necessary to transform R&D investments into commercially viable products and services.

To illustrate this point, suppose that IP rights are restored to robust levels in the previous hypothetical. In that case, the information-sharing roadblock is mitigated and Startup can disclose its innovation to Incumbent (or any other manufacturer) and secure business terms that reflect the contribution of its innovation to Incumbent's product system. In this scenario, patents not only incentivize innovation following the standard economic rationale for IP rights but cultivate the value of an innovation by enabling "win-win" informational exchanges between innovators and implementers with complementary production and distribution capacities.

Illustration: The BioNTech-Pfizer Partnership

A vivid illustration of the enabling effect of robust IP rights, and the social value that it generates, is provided by the relationship between BioNTech, a smaller biotech firm, and Pfizer, a large pharmaceutical manufacturer, in the successful development, testing, production, and distribution of a pathbreaking COVID-19 vaccine based on mRNA technology.

Without patents, BioNTech and Pfizer would likely have had difficulty engaging in the informational exchanges that are necessary to support a partnership between a firm that excels in biopharmaceutical innovation and a firm that excels in the activities required to convert that innovation into an FDA-approved and mass-produced medication. The risk of losing its crown-jewel knowledge assets would likely have discouraged BioNTech from disclosing those assets to Pfizer. This would have impeded BioNTech's ability to secure venture capital, as those supplying venture capital must

identify a feasible exit transaction to justify investing in the first place.

The BioNTech-Pfizer alliance is hardly atypical. To the contrary: it follows the standard transactional template that has supported thousands of relationships between biotech startups and Big Pharma incumbents.⁴

This has been true since the inception of the biotech industry, which happened to coincide with the reinvigoration of patent protection following passage of the Bayh-Dole Act and establishment of the Court of Appeals for the Federal Circuit in the early 1980s. Starting with a partnership between Genentech (then a startup) and Eli Lilly, which resulted in the first commercial release of a biopharmaceutical product (synthetic human insulin) in 1982, patents have been used almost universally to structure relationships between biotech and pharmaceutical firms in the commercial development of lifesaving medical therapies. Contrary to persistent but undemonstrated assertions, patents have not generally protected incumbents against entry in the biopharmaceutical industry; to the contrary, they have generally facilitated entry and enabled venture capital-backed startups to partner with, and sometimes challenge, incumbents.

How IP Rights Favorably Impact Market Structure

Patents not only support R&D by smaller firms that specialize in innovation but enhance the competitive vigor of the innovation ecosystem as a whole. To appreciate this point, it is helpful to consider two variations on the previous hypothetical example involving Incumbent, the auto manufacturer, and Startup, the component innovator.

Suppose patent protection were weakened significantly. In that case, Startup would have difficulty securing outside capital and might never enter the market at all. As a result, R&D would tend to concentrate in large firms like Incumbent that can

maintain end-to-end pipelines from innovation through market release. This substitution of Incumbent for Startup comes at a significant price. Large firms like Incumbent tend to focus on incremental innovations that improve, rather than challenge, existing technologies. This means that innovation may suffer qualitatively and in a manner that impedes the process of “creative destruction” that characterizes the most vigorous innovation ecosystems.

Now suppose patent protection is restored. Startup could then enter the market as an innovation specialist and negotiate relationships not only with Incumbent but any other vehicle manufacturer. As a result, Startup could license its sensor technology to every interested manufacturer, each of which would incorporate the technology into vehicles sold to consumers. Contrary to standard assumptions, strengthening patent protection in this scenario both facilitates entry and promotes access to technology, making the market more competitive as compared to a weaker patent environment.

Historical Evidence

These arguments are not merely theoretical. In my book, I study 120 years of US patent and antitrust history and assess the extent to which the strength of patent protection impacts transactional structures for undertaking and commercializing innovation. A striking pattern emerges.

When patent protection is strong, commercialization tends to take place through contractual relationships that match smaller firms that specialize in innovation with larger firms that specialize in production and distribution. Remarkably, this disaggregated supply chain emerged in the commercialization of breakthrough innovations in radio communications during the early twentieth century and again in the commercialization of foundational innovations in wireless communications during the late twentieth and early twenty-first centuries. The mobile communications technologies that are now ubiquitous, and the basis for multiple new business models

such as ride-sharing (see Uber) and online food delivery (see DoorDash), were monetized through this type of business structure. This also explains why a significant portion of the semiconductor industry supported the patentees in Supreme Court litigation, as shown in table 1 above, reflecting the fact that the lead innovators in wireless communications principally monetize their R&D through licensing relationships with device producers.

When patent protection is weak, innovation may persist in some industries but it is undertaken and commercialized principally by larger integrated firms that are protected by non-IP advantages or supported by government subsidies. AT&T again can illustrate. AT&T's Bell Labs achieved significant innovations during several decades following World War II. However, it was funded by the revenue streams generated through the parent company's statutory monopoly over national telephone service and equipment. While Bell Labs

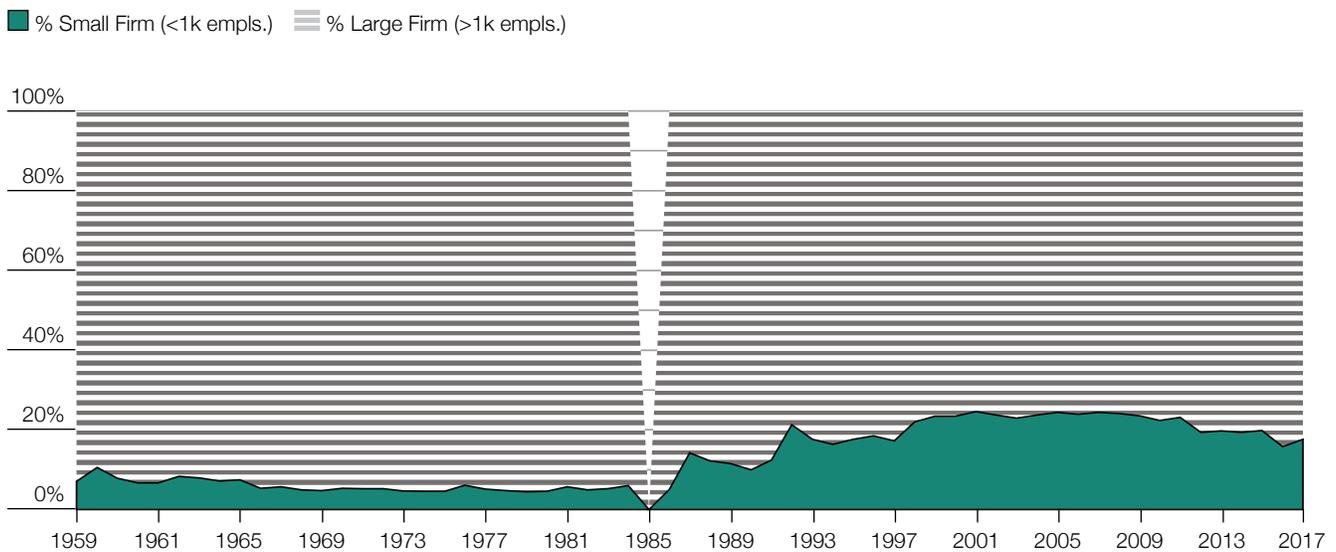
maintained a world-famous research facility in a weak-patent environment, this came at a significant social cost since it relied on its parent company's near-perfect monopoly in the associated communications markets. The lack of competitive pressure may explain why Bell Labs excelled in basic research but was often slow in translating that research into new products for consumers.

Patents and Entrepreneurial Innovation

Examining US patent history through the lens of organizational form yields novel insights that challenge conventional wisdom, with important policy implications for the IP and antitrust interface.

In particular, these findings challenge conventional wisdom among IP and antitrust policymakers that robust patent protection inherently stands in tension with preserving competitive markets. Over a century's worth of US patent

Figure 1: Company R&D Expenditures by Firm Size (1957-2017)



Source: This figure is reproduced by permission of Oxford University Press. For full version, see Jonathan M. Barnett, *Innovators, Firms, and Markets: The Organizational Logic of Intellectual Property*, 111, figure 5.6 (Oxford University Press 2021), which describes sources and methodology. Note: Small firms are defined as firms with less than 1000 employees. Data is unavailable for 1985.

and technology history suggests that there is often no such trade-off. In a significant number of industries, secure patent protection has enabled the entry of entrepreneurial innovators backed by outside risk capital—a potent combination that can challenge existing technological paradigms, threaten market leaders, and drive high-intensity innovation ecosystems. When patent protection is weakened, these tendencies are likely to be reversed, leading to low-intensity innovation ecosystems in which outside capital is reluctant to invest, entry opportunities into concentrated markets are limited, and innovation retreats to larger integrated firms that tend to focus on incremental, rather than transformative, R&D projects.

These surprising outcomes can be observed by comparing the US innovation economy in 1966, when patent protection was weak, to the US innovation economy in 2006, when it was strong.

While R&D investment as a percentage of GDP was comparable in both years (2.71% in 1966 and 2.53% in 2006), per capita annual patent applications had more than doubled by 2006 (743 per one million US residents, as compared to 340 in 1966), reflecting the increasing efficacy of using patents to capture returns on innovation following the shift toward a strong-patent regime in the 1980s. Constant R&D investment but variable patenting rates are consistent with the view that the innovation economy as a whole can often adapt to weaker or stronger forms of patent protection. Critically, however, the data also show that only certain types of firms can adapt to a weak-patent regime. As the figure below illustrates, the long period of weak patent protection through the 1970s exhibited a heavy concentration of R&D

among large firms (which often relied on federal R&D funding or defense procurement contracts). The advent of strong patent protection in the early 1980s was soon followed by a shift of innovation activity toward small firms, which represented almost 24% of total company R&D expenditures by 2006, as compared to about 5% in 1966. Given that total R&D investment holds constant but competitive intensity increases, this is a net gain as a matter of both antitrust and innovation policy.

Revisiting the IP-Skeptical Policy Consensus

The standard “IP = monopoly” assumption has driven the continuous reduction in patent strength by the Supreme Court, Congress, and antitrust regulators for over a decade and a half. The history, economics, and politics of US technology markets from the late nineteenth century through the present cast great doubt on this assumption. In a wide range of markets and historical periods, insecure IP rights appear to shelter entrenched incumbents from the entry threats posed by smaller but more innovative firms. This explains the otherwise puzzling finding that, outside the pharmaceutical industry, larger technology firms have generally supported weakening patents or, in some cases, have opposed patents entirely. This strategy makes sense: weak or nonexistent patents advantage larger integrated firms while disadvantaging smaller firms that have strong innovation but weak commercialization capacities. Rather than advancing the public interest in a robust innovation economy, IP-skeptical policies undertaken by courts, legislators, and regulators may have mostly promoted the private interests of large technology firms that advocated for those policies.

Endnotes

- 1 Steven W. Usselman, "Patents Purloined: Railroads, Inventors, and the Diffusion of Innovation in 19th-Century America," *Technology & Culture* 1047 (1991): 32.
- 2 Gerardo Con Diaz, *Software Rights: How Patent Law Transformed Software Development in America* (New Haven: Yale University Press, 2019), 67-68.
- 3 Alliance of U.S. Startups & Inventors for Jobs, "How 'One Bite at the Apple' Became Serial Attacks on High Quality Patents at the PTAB (Oct. 17, 2018); Steven Carlson and Ryan Schultz, "Tallying Repetitive Inter Partes Review Challenges," *Law360* (Sept. 14, 2018).
- 4 On vertically disintegrated structures in the biotech industry, see Gary P. Pisano, *Science Business: The Promise, the Reality, and the Future of Biotech* (Boston: Harvard Business School Press, 2006); Robert P. Merges and Josh Lerner, "The Control of Strategic Alliances: An Empirical Analysis of Biotechnology Collaboration." National Bureau of Economic Research, Working Paper Series No. 6014, 1997.



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