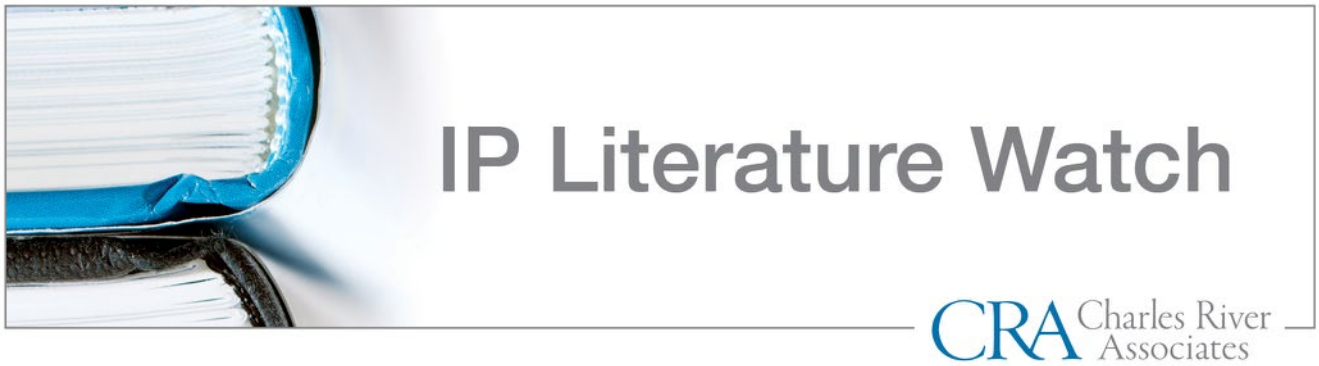


February 2023

This newsletter contains an overview of recent publications concerning intellectual property issues. The abstracts included below are as written by the author(s) and are unedited.

# IP & Licensing

### Why Can't We Be FRANDs?: Anti-Suit Injunctions, International Comity, and International Commercial Arbitration in Standard-Essential Patent Litigation

Raghavendra Murthy (Vanderbilt University, Law School)
*Vanderbilt Law Review, Vol. 75, No. 5, 2022*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4336994**

Picking up a smartphone to contact someone across the globe is facilitated by technical standards like 5G. These standards allow for technological compatibility worldwide. For instance, a 5G capable device can connect to 5G networks anywhere in the world because the same 5G standard is used globally. Standards, particularly those integral to the telecommunications industry, are also highly complex and contain many patents that are necessarily infringed when the standard is implemented. To avoid rampant patent infringement, owners of these standard-essential patents ("SEPs") are required to license them to standard implementers at fair, reasonable, and nondiscriminatory ("FRAND") rates when their patents are incorporated into a standard. Apart from that, standard setting organizations ("SSOs") provide minimal guidance about what rates are FRAND. As a result, SEP litigation over whether a rate is FRAND has spiked.

Courts hearing FRAND cases can set global rates, but patent rights are territorial. In response to the threat of foreign courts setting rates on patents granted in their jurisdiction, some courts have issued anti-suit injunctions to prevent parties from litigating a FRAND dispute elsewhere. This rise in anti-suit injunctions has resulted in some courts turning to anti-anti-suit injunctions as a response or preemptive measure. Parties have even petitioned courts for anti-anti-anti-suit injunctions. This spiral poses a threat to international comity because these injunctions, although directed at the litigants, interfere with a foreign court's ability to decide what to do with a matter before it. Within the FRAND context, an added danger is the potential breakdown of future technological interoperability if some parts of the world adopt different standards than others. For example, this might make some smartphones incompatible with some cellular data networks. In place of litigation, international commercial arbitration has been used with some success in FRAND disputes, but there are downsides to using arbitration alone.

This Note recommends federal courts grant anti-suit injunctions in SEP litigation only under a restrictive test, rather than maintaining the current variation by circuit. Injunctions that up the "anti" should face greater scrutiny under a stricter test with international comity guiding the decision through concrete factors outlined in the sections on nonrecognition of foreign judgments in the Restatement (Fourth) of Foreign Relations Law of the United States. The Note further suggests that Congress should codify this test, but in the event of an injunction spiral that might preclude litigation altogether, SSOs should require the parties arbitrate the dispute before experts at the World Intellectual Property Organization ("WIPO"). Together, litigation and arbitration can help preserve the interconnected and technologically compatible system currently in place around the world.

### Smart Royalties: Tackling the Music Industry's Copyright Data Discrepancies Through Blockchain Technology, Smart Contracts, and Non-Fungible Tokens

Amanda Sharp (University of San Diego School of Law)
Orly Lobel (University of San Diego School of Law)
*IDEA®: The Law Review of the Franklin Pierce Center for Intellectual Property, forthcoming*
*San Diego Legal Studies Paper No. 23-007*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4343131**

Blockchain technology, smart contracts, and non-fungible tokens ("NFTs") can create faster, more transparent royalty regulation and distribution for music creators while improving the initiatives set forth in the Music Modernization Act of 2018 ("MMA"). No one likes a broken record, but the music industry's system for royalty collection and distribution has been disjunct, inefficient, and incomplete since the digitization of CDs into MP3 files in the 1990s. There have only been retroactive fixes to treat the symptoms of a broken system with no proactive solutions to identify the cause of the underlying issues and eradicate them. This article analyzes the incomplete history of digitizing musical metadata and highlights how vital comprehensive royalty regulation is to creators by considering the ramifications unmatched and unclaimed works have on these individuals. The article proposes three initiatives to address the inconsistent metadata standard currently disrupting digital music consumption: (1) the creation of an MMA-specific blockchain that provides uniform, transparent data standards; (2) the implementation of smart contracts to facilitate autonomous royalty distribution; and (3) the utilization of NFTs to connect smart contract functionality with blockchain's uniformity.

## IP & Litigation

### Patent-Infringement Suits and the Right to a Jury Trial

Tomas Gomez-Arostegui (Lewis & Clark Law School)
Sean Bottomley (Northumbria University)
*American University Law Review, 2023 (Forthcoming)*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4353137**

This Article analyzes whether the Seventh Amendment affords a right to a jury trial in suits in which the owner of a patent seeks only equitable relief against an accused infringer. The existence of jury rights carries important consequences for litigants. Like many issues involving application of the Constitution, the availability and scope of the right to a jury depends on 18th-century English legal history. Current doctrine holds that litigants in equity had no right to a jury in patent cases in England c.1791 and that therefore litigants today who seek only injunctive relief possess no such right either. But as we demonstrate here, the relevant historical record shows the contrary, and thus many litigants have a constitutional right to a jury where the courts presently deny them. We reach our conclusion after

undertaking the most comprehensive treatment of the subject to date, which includes marshaling hundreds of 18th-century records (mostly in manuscript) from the National Archives of the U.K. and elsewhere.

## The Hidden Cost of University Patents

CJ Ryan (University of Louisville – Louis D. Brandeis School of Law; American Bar Foundation)
W. Michael Schuster (University of Georgia – C. Herman and Mary Virginia Terry College of Business)
Brian L. Frye (University of Kentucky – College of Law; Dogecoin DAO Legal Scholarship Page; Rug Radio DAO Grifting Division)
*University of Louisville School of Law Legal Studies Research Paper Series Forthcoming*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4346261**

Universities are encouraged to undertake research through grants from government agencies, foundations, and other organizations. The Bayh-Dole Act reinforces this incentive structure by allowing universities to take ownership of the resultant patents. Included in these rights is the ability to generate income by licensing patents and bringing patent infringement lawsuits. Undoubtedly, exercising these rights to financially benefit the university is economically rational. But might such actions also impose a cost on the public despite the fact that these very patents arose from public research subsidies?

This study examines the relationship between a university's research expenditures and its likelihood to litigate patent infringement claims. It finds that research expenditures increase litigation frequency, suggesting that universities may use funds earmarked for research and innovation on patent litigation. We argue that patent rights provided by the Bayh-Dole Act may motivate this phenomenon—which encourages universities to seek rents, rather than pursue innovation. Our study adds to the extant literature about firm behavior, describing universities as vertical integrators as well as horizontal coordinators. It further suggests that these coordination inure to a university's private benefit—but not necessarily the benefit of the public, for which universities are ostensibly organized.

## Central Judicial Inspector: Establishment of Circuit Tribunals and Corporate Innovation in China

Kai Wu (Central University of Finance and Economics (CUFE) – School of Finance)
Minli Sun (Central University of Finance and Economics (CUFE) – School of Finance)
Yuzi Chen (Central University of Finance and Economics (CUFE) – School of Finance)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4337058**

The growing localization of the judicial system has been a critical concern in China's justice reform, and its consequence on entrepreneurship receives little attention. We evaluate the effects of judicial reform on the innovation of private-controlled listed firms in China using the transformation of judicial decentralization: inter-provincial circuit tribunals. Results show that the establishment of circuit tribunals significantly promotes innovation quantity and quality. The legal reform affects firms' incentives to innovate by increasing access to long-term bank loans and enhancing risk tolerance. The positive effect is more pronounced for firms with weaker political ties, a longer distance from the Supreme People's Court, and a better market institution for the private sector. Our findings provide policy implications of judicial checks and balances for promoting regional innovation activities in emerging countries.

# IP & Innovation

## A Patent and a Prize

Keith N. Hylton (Boston University - School of Law)
*Boston Univ. School of Law Research Paper No. 23-7*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4351974**

This paper examines a simple and old question: should innovators receive a patent or a prize? The answer I provide is equally simple: they should receive both. The literature on patents versus prizes has proceeded mostly under the assumption that there should be a choice between a regime of patents and a regime of prizes in which patents fall into the public domain upon award of the prize. There are significant “public choice costs” under the prize plans. By this I mean there are risks of inappropriate transfers to patentees – that is, looting – and of confiscation of patentees, through the conduct of or through the omissions of government agents. The innovation regime I propose is a patent-plus-prize scheme. The patentee would receive the patent and a prize that approximates consumer surplus. Public choice costs are considerably lower than under prize schemes: there would be no looting and no risk of confiscation under patent-plus-prize. In addition, private and social incentives to innovate are aligned.

## R&D Tax Credits, Technology Spillovers, and Firms’ Product Convergence

Seong K. Byun (Virginia Commonwealth University (VCU) – Department of Finance, Insurance & Real Estate)
Jong-Min Oh (SungKyunKwan University (SKKU) – SKK Business School)
Han Xia (University of Texas at Dallas – Naveen Jindal School of Management)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4351327**

Using a difference-in-differences (DiD) setting that leverages the staggered adoption of R&D tax credits across the U.S. states, we show that after a firm receives the tax credits, products of its peers become significantly more similar to the recipient firm. Such product convergence is particularly strong when peer firms face greater pressure from market participants to uphold short-term performances. We further show that the effect of R&D tax credits likely works through the increased technology spillovers, which motivate peers to imitate instead of differentiating. Accordingly, we show that peer firms shift their patent composition from breakthrough to incremental innovations following the R&D tax subsidy.

## Intellectual Property Rights, Taxation, and Firms’ Innovation: Theory and Evidence from China

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Yibai Yang (University of Macau – Department of Economics)
Zhijie Zheng (Beijing Normal University – Zhuhai Campus)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4343730**

This study develops an R&D-based growth model with taxation to explore the heterogeneous effects of intellectual property rights (IPR) protection on innovation of firms with different tax rates. Our theoretical analysis shows that strengthening IPR stimulates innovation, and a higher tax rate dampens the positive effect of IPR. Moreover, we find supportive evidence for the theoretical result

using firm-level data in China. Our empirical analysis shows that strengthening IPR is associated with less innovation by high-tax firms and more innovation by low-tax firms.

### Innovation and Appropriation: Insights from the Chinese Patent Survey

Dong Cheng (Union College)
Michael A. Klein (Rensselaer Polytechnic Institute)
M. Fuat Sener (Union College – Department of Economics)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4345122**

Using comprehensive microdata based on the Chinese Patent Survey, we examine the appropriation strategies that firms use to capture value from their innovations. Our data allow us to analyze firm preferences over five distinct appropriation strategies, as well as the motivations underpinning these strategies. We find a robust overall preference for the use of patents among Chinese firms in all industries and across multiple characteristics. However, our results indicate that firms pursuing the most expensive R&D projects exhibit a relative preference for secrecy over patents, consistent with theories that predict the use of secrecy to protect a firm's most valuable intellectual assets. Furthermore, we find that firms routinely indicate a preference for multiple, complementary strategies to protect innovations. In particular, our findings suggest that firms utilize patents to secure initial financing and negotiate third party production contracts, while relying on secrecy and/or first mover advantage to protect against competitor imitation.

## IP Law & Policy

### A New Approach to Patent Reform

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Michael J. Meurer (Boston University – School of Law)
Mark Schankerman (London School of Economics & Political Science (LSE) – London School of Economics)
Florian Schuett (KU Leuven – Department of Economics; Tilburg Law and Economics Center (TILEC); Tilburg University – Tilburg University School of Economics and Management)
*Boston Univ. School of Law Research Paper No. 23-9*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4357386**

Scholars and policy makers have tried for years to solve the tenacious and harmful crisis of low quality, erroneously granted patents. Far from resolving the problem, these determined efforts have resulted in hundreds of conflicting policy proposals, failed Congressional bills, and no way to evaluate the policies' value or impact or to decide between the overwhelming multiplicity of policies.

This Article provides not only new solutions, but a new approach for designing and assessing policies both in patent law and legal systems more generally. We introduce a formal economic model of the patent system that differs from existing scholarship because it permits us to (1) determine how a policy change to one part of the patent system affects the system as a whole; and (2) quantify the impact of policy changes. Existing scholarship typically analyses a policy by assessing its effect on just the targeted element of the patent system, but legal systems are complex with interrelated components and players react along multiple margins, so these analyses are incomplete and sometimes incorrect. Our approach fixes this problem, providing a comprehensive understanding of how a policy change affects the patent system from beginning-to-end. It also permits us to conduct complex analyses such

as varying multiple policies at once. Further, much existing scholarship fails to quantify the magnitude of a policy's effect, and even empirical scholarship can only measure the effect of an already-implemented policy, not predict the effect of a proposed change. Quantification is critical because policies generally have multiple effects, often in countervailing directions. Quantification—as shown using our model—permits scholars to determine the overall direction and size of a theoretically ambiguous effect. Quantification also allows us to compare the social welfare effects of different reforms so that policy-makers know where to focus their efforts.

We apply our model to several of the most prominent policy debates in patent law. We conclude that certain reforms such as regulation of settlement licenses and increased examination intensity yield large gains in social welfare and should be prioritized. Other reforms that are popular with scholars, including decreasing the availability of injunctions and reducing litigation costs produce surprisingly small gains in social welfare. Often existing scholarship operates too much on intuition, which, we show, can be wrong. Our new approach to patent reform provides an approach that offers deeper understanding and a more effective evaluation framework.

## Distinguishing and Predicting Drug Patents

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Nicholas Halkowski (Wilson Sonsini Goodrich & Rosati)
Jeffrey M. Kuhn (University of North Carolina (UNC) at Chapel Hill – Kenan-Flagler Business School)
*Forthcoming March 2023, Nature Biotech*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4337084**

Responsive to calls from lawmakers, the USPTO has recently announced a broad set of measures to increase the quality of drug patents ex ante, before they are granted, as a way of in the US. However, there is currently no way to tell which patent applications cover inventions that will lead to FDA-approved drugs, potentially compromising the efficiency and effectiveness of the agency's efforts. Nor is it known how drug patent applicants differ from others in their use of examination tactics such as those that increase the number of patents that cover a drug. We address these informational deficits predictively and descriptively through an analysis of patents issued in 2005-2015 that cover drugs as identified through their listing in the FDA's "Orange Book." We find that even within the same technology areas, patent applications that mature into drug patents differ from other patent applications along several dimensions, showing intensified use of continuations, terminal disclaimers, Track One examination acceleration, and applicant- submitted prior art. Applying machine learning models, we find traits publicly observable at publication and grant to be reasonably predictive of a patent's eventual designation as a drug patent. A random forest model trained on publication characteristics is associated with an area under the curve (AUC) statistic of 0.83, which improves to 0.91 when grant characteristics are used. The AUC statistic for predicting the first patent associated with a drug to be listed in the OB based on grant characteristics is ~0.9, and for subsequent patents, it is 0.97.

## Policy-Driven Innovation: The Case of China

Mo Xiao (University of Arizona – Eller College of Management – Department of Economics)
Han Yuan (Sun Yat-sen University)
Quarterly Journal of Economics and Management, Forthcoming
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4361083**

Government policies are often difficult to measure. This is especially true in China, where local governments have numerous, formal or informal, policy tools at their disposal. We propose a measure

of pro-innovation policy effort by counting the number of articles mentioning “专利” (patent) in each official provincial newspaper and deflating it with a proxy of the number of total articles. We then investigate the effect of such policy measures on the patenting activities of listed firms from 2001 to 2010. To deal with policy endogeneity, we adopt an instrumental variable approach that leverages on the possibility that provincial-level disaster relief activities compete for governmental attention and resources devoted to innovation. Our results show that innovation policies increase the patent applications of listed firms without decreasing their quality. This effect is most salient on the extensive margin. Non-state-owned enterprises (SOEs) are more responsive to innovation policies, partly because they are more likely to be on the extensive margin.

# Copyright Law

### The Artificial Creatives: The Rise of Combinatorial Creativity from Dall-E to GPT-3

Giancarlo Frosio (Queen’s University Belfast – School of Law)
*Martha Garcia-Murillo, Ian MacInnes, and Andrea Renda (eds), Handbook of Artificial Intelligence at Work: Interconnections and Policy Implications (Edward Elgar, Forthcoming)*
*Queen’s University Belfast Law Research Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4350802**

This chapter considers the impact of generative AI, such as Dall-E, Jasper or ChatGPT-3, on artists and creatives as a category of workers and their creative outputs. The ever-evolving technology serves diverse purposes and could possibly replace humans everywhere, including the once inherently human-centered field of creativity. On one side, great emphasis will be given to the emergence of the machine as an author and how copyright law can be affected by AI. On the other side, the chapter will consider the provision of incentives to protect AI-generated creativity. Introducing incentives to bolster innovation and commercialisation of AI-generated creativity stands as a critical policy decision that will impact the future of human creations and creatives as well. Finally, this chapter will provide a set of suggestions to minimize the likely disruption to the creative market that AI-generated creativity will bring about.

### Navigating the Trans-Atlantic Design Protection Quandary

Peter S. Menell (UC Berkeley School of Law)
*Péter Mezei, Anett Pogácsás, & Hannibal Travis (eds.), Harmonizing Intellectual Property Law for a Trans-Atlantic Knowledge Economy (Forthcoming 2023)*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4335377**

This chapter traces the development of design protection law, which cuts across a wide range of industries and the intellectual property landscapes in the United States and Europe. It focuses on the non-functionality doctrine, which aims to prevent protection of functional features of useful articles outside of utility patent systems. In fields such as robotics and consumer products, lax design protection and design infringement standards undermine legitimate competition and cumulative creativity. The application of non-functionality doctrines is confused and strained on both sides of the Atlantic, although more so in the United States. Notwithstanding ready solutions to the overprotection risk, the prospects for correction, clarification, and harmonization of design protection are inauspicious.

## An Empirical Study of the DMCA's Anti-Circumvention Provisions

Clark D. Asay (Brigham Young University – J. Reuben Clark Law School)

*Working Paper*

**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4343160**

The DMCA has been a flashpoint during most of its twenty-five-year existence. One of the most controversial parts of the DMCA is Section 1201. Among other things, Section 1201 prohibits third parties from circumventing certain controls to copyrighted content or trafficking in tools that enable circumvention of technological controls. However, despite its nearly quarter-of-a-century lifespan, we know very little about Section 1201 empirically. While certain aspects of the broader DMCA have received empirical assessments, Section 1201 has not. Our understanding of Section 1201 is largely based on anecdotal evidence, in the form of leading opinions from historically prominent copyright circuits. But this anecdotal evidence is hardly a solid basis for ongoing discussions about how Section 1201 is performing and whether it needs revising. In this Article, we seek to address these and other issues.

To do so, we conducted a broad-based search of Westlaw to collect every issued opinion, whether reported or not, where a court purported to apply some part of Section 1201. We then reviewed these cases to glean as much useful information about Section 1201 as possible. This review led to a number of important and, in some cases, surprising results. First, Section 1201 opinions are a relative rarity. In the nearly quarter of a century since the DMCA's enactment, we could find only a little over 200 opinions, with only about sixty of those being published. The average number of opinions during the DMCA's existence has been around nine annually, which pales in comparison to other types of copyright cases. Second, despite the Second Circuit receiving much attention in anecdotal accountings of Section 1201, courts within it issue Section 1201 opinions infrequently. The Ninth Circuit is the dominant Section 1201 court, both in terms of citations to its opinions and overall number of opinions, and the Sixth and Eleventh Circuits both issue more Section 1201 opinions than the Second Circuit. This result stands in contrast to other types of copyright litigation, where the Second Circuit is a behemoth. Third, the most common subject matter in dispute in Section 1201 cases is computer software, followed distantly by audiovisual material such as movies. Music stands in last place, showing up in only a couple issued opinions. Debates at the time of the DMCA's enactment were informed by widespread fears of copyright infringement relating to digital music and other types of digital content. Yet Section 1201 has resulted in but few litigations involving those subject matters. Fourth, suits and defaults against individuals happen frequently in the Section 1201 context, with courts often assessing large statutory damages against those individuals. As we discuss in the paper, this result raises important equity issues. Fifth, despite Section 1201 including a number of statutory exceptions, these exceptions basically never make their way into issued opinions. Fair use, too, only infrequently enters courts' Section 1201 discussions. This means, effectively, that the primary way to escape Section 1201 liability is through administrative exceptions granted by the Library of Congress on a triennial basis. But as we shall see, this process has significant holes. Finally, plaintiffs disproportionately win Section 1201 cases. This result is somewhat bloated because of the frequency of defaults against individuals. Setting these aside, plaintiffs still enjoy tremendous success under Section 1201. However, when looking at opinions only outside of the Ninth Circuit, win rates become mostly even.

I conclude with several calls for DMCA reform. These include bolstering statutory exceptions and more closely tying Section 1201 to copyright infringement. Pursuing these reforms, I argue, will more faithfully align Section 1201 with its purported objectives.

# IP & Trade

## Innovation, Imitation, and Political Cleavages in International Trade and Patent Protection

Sojun Park (Princeton University)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4360040**

The distributional consequences of intra-industry trade are well documented in the literature, yet exporting firms shape trade policy in their favor. How? I argue that exporters expect higher returns from lobbying when they face more intense import competition. I introduce a model of international patent protection, where patent holders influence the policy making process. In the equilibrium, companies whose exports are prone to reverse engineering by import-competing firms due to their long product lifetime seek strong patent protection by home government. To test the theory, I measure product cycles, using millions of patent citations, and collect lobbying reports filed on US trade agreements on patent protection, signed after the Doha Round. I find that US patent holders who manufacture products with long lifecycles lobbied the congress more to ratify the US trade agreements. This tendency becomes more pronounced as the agreements adopt higher standards of patent protection. The results illustrate how the winners maintain the status quo in international trade.

## Patent Dependency Under European and European Union Patent Law – a Regulatory Gap

Hanns Ullrich (Max Planck Institute for Innovation and Competition)
*Max Planck Institute for Innovation & Competition Research Paper No. 23-04*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4339426**

Technological progress generally is not disruptive but sequential. Innovations build on prior innovations, typically by presenting improvements or complements. Under patent law, such follow-on innovation meets with an obstacle if the use of the invention underlying it infringes a prior patent, and if, for one reason or another, the owner of that prior patent prefers, as it may, to refuse granting a license. It is only in case the follow-on (or “second”) invention involves an important technical advance of considerable economic significance in relation to the invention claimed in the prior (or “first”) patent that in Europe, in accordance with Art. 31 TRIPS, national patent laws provide for a right of the owner of the second patent to obtain, by way of a decision of the patent office or of a court, a dependency license. By contrast, the EU’s system of unitary patent protection does not provide for a dependency licensing regime. Instead, Reg. 1257/2021 on the European patent with unitary effect refers the matter to national law. This means that despite the importance of its invention the owner of a dependent patent will never obtain a mandatory license covering the Internal Market but only territorially limited national licenses for which it must apply separately in each Member State, go through multiple different procedures and comply with different national requirements. The absurdity of such hindering of follow-on innovation in the Internal Market by regulatory abstention is no less as regards national patents that the European Patent Office grants as a bundle in the form of the European patent and that are now additionally held together by the uniform infringement rules of the Unified Patent Court Agreement. After all, that category of a European patent is supposed to represent an equivalent alternative to the unitary patent and, therefore, ought to meet the same Internal Market requirements. Therefore, this study proposes to harmonize Member States’ dependency licensing regimes and to complement the system of unitary patent protection accordingly. To this end, it presents the common principles of national regimes, analyzes the particular need for and characteristics of modern

mandatory licensing rules and discusses the deficits of alternative approaches that might be available under EU competition law. A particular stress is put on distinguishing dependency licensing from compulsory licensing in the public interest, and on the functional complementarity existing between incentivizing inventions by patent protection and stimulating follow-on innovation by mandatory licensing regimes.

# Other Topics

### The Relation between Patent Pledgeability and Credit Rationing

Aineas Mallios (University of Gothenburg)
Ted Lindblom (Göteborg University – School of Business, Economics and Law)
Stefan Sjögren (University of Gothenburg – Centre for Finance – School of Business, Economics and Law)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4342093**

We analyze the economic issue raised when financial intermediaries refuse to supply credit to a borrower even at a higher rate than that posted by lenders. We suggest that patent-backed loans can be used as a contracting device to reduce credit rationing in loan markets characterized by imperfect information. Patents have become among the most valuable assets of firms in high technology industries. They determine the production of goods and contain information about the firms' credit quality. Patents can also be used by banks to screen borrowers. We provide a theoretical foundation showing that patents used as collateral may reduce the level of information asymmetry in loan markets and facilitate also bank lending. Using a setup of financial intermediation with capital constrained entities and imperfect information, we suggest that patent pledging can be used to minimize credit rationing. This may lead to more investment in innovation and more growth.

### Banking Crisis, Venture Capital and Innovation

Won Sung (Bank of Korea)
Chun-Yu Ho (State University of New York (SUNY) – Department of Economics)
*Bank of Korea WP 2023-4*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4353285**

This paper examines how venture capital alters the impact of banking crises on innovation based on cross-country industry-level data for the period 1980-2012. We exploit the banking crisis as a quasi-experiment for the tightening of bank credit and show several findings. First, the banking crisis causes a lower aggregate rate of innovation for at least five years. Second, the innovation dampening effect of the banking crisis is stronger for industries depending more on external finance. Third, for those industries depending on external finance, the innovation dampening effect of the banking crisis can be mitigated by a more developed venture capital market. Overall, our results highlight that venture capital financing can substitute bank financing for funding innovation during and after banking crises. Our results are robust to the uses of alternative measures of venture capital and external finance dependence, specification, dates of the banking crisis, and post-crisis time window. Finally, the supporting role of venture capital financing for innovation during and after banking crises is stronger for countries with better intellectual property rights and higher political democratization.

### Right Idea, Wrong Place? Knowledge Diffusion and Spatial Misallocation in R&D

Trevor Williams (Yale University, Department of Economics, Students)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4360155**

A few cities perform a high share of research and development (R&D) in the United States. If R&D generates local knowledge spillovers, then the social returns to R&D may vary across cities and the geographic distribution of researchers may be inefficient. Equally important, but less well understood, is whether the private returns to R&D vary systematically across space. In this direction, I document a new fact from the market for technology: patent sales from inventor to firm decline steeply with distance, other things equal. My interpretation is that it is hard for inventors to commercialize their ideas in distant markets. Through the lens of a spatial growth model, I then infer that the private returns to R&D are low in remote regions. By contrast, spillovers are relatively flat across space because patent citations decline slowly with distance. Place-based R&D policy subsidizes research not in dense cities, but in remote locations where private returns are low. The optimal policy increases patenting by 3.6% and aggregate consumption by 1% in the long run, with minimal effects on inequality across regions or workers.

### Patents with Simultaneous Innovations: The Non-Obviousness Requirement and the Direction of Innovation

Fabio M. Manenti (University of Padua – Department of Economics and Management)
Luca Sandrini (Budapest University of Technology and Economics)
*Working Paper*
**https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4350572**

We model a three-stage duopolistic game where firms first simultaneously choose the technological direction of their innovation, then invest in the chosen direction, and finally, compete. Investments can be in competing or non-competing innovations and their outcome is uncertain. If successful, a firm can be imitated by the rival. Patent protection prevents imitation and is granted to non-obvious innovations. We show that compared to a regime where negligible innovations are patentable, strengthening the non-obviousness requirement for patentability can increase market efficiency. Importantly, we also show that the level of the requirement may affect the direction of firms' R&D trajectories. While in a mild patent regime firms tend to invest in competing technologies, a stricter non-obviousness requirement may induce firms to operate in different technological areas, and this increases social welfare and consumer surplus. We illustrate our general theory through a stylized model of Cournot competition with process innovations.

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