IP Literature Watch

CRA Charles River Associates

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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 & Antitrust

When Standards Meet Patents: The Economics of SEPs and FRAND

Gaétan de Rassenfosse (École Polytechnique Fédérale de Lausanne (EPFL))
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6306998

Standards create value by enabling interoperability, network effects, and scale—but when implementing a standard requires patented technology, licensing becomes a distinctive bargaining problem. This article explains how standard-essential patents (SEPs) transform negotiations by creating lock-in and complementarity, motivating disputes over “hold-up” and “hold-out.” It then reviews the main governance responses: FRAND commitments that aim to anchor royalties to ex-ante incremental value, limits on injunction leverage, and coordination mechanisms such as patent pools. Finally, it explains why noisy, self-declared essentiality inflates thickets, complicates pooling, and raises transaction costs—highlighting the policy trade-off between rewarding contributions and preserving diffusion.

IP & Licensing

Incomplete Patent Pools

Erik Hovenkamp (Cornell University – Law School)
Jorge Lemus (University of Illinois at Urbana-Champaign)
John L. Turner (University of Georgia – C. Herman and Mary Virginia Terry College of Business – Department of Economics)
Georgia State University College of Law, Legal Studies Research Paper (forthcoming)
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6358901

Technology standards require implementers to license thousands of complementary standard-essential patents. Patent pools coordinate licensing but are typically incomplete: patentees are divided across multiple pools and some remain independent. Prior work attributes this to a coordination failure among patentees. We show that, when implementers have buyer power, incomplete pooling increases aggregate patentee profits by counteracting buyer power. This force persists under double marginalization and network effects. Incompleteness can undermine efficiency and skew the distribution of surplus. Comparable licenses can sometimes promote completeness but are also subject to strategic abuse.

IP & Litigation

Aggregate Royalty for Cellular SEPs in Recent Court Decisions

Nadia Soboleva (Charles River Associates)
John Hayes (Charles River Associates)
GRUR Patent
https://www.crai.com/insights-events/publications/aggregate-royalty-for-cellular-seps-in-recent-court-decisions/

Standards organizations developing cellular communication standards typically require participants to disclose standard essential patents (SEPs) and agree to license such patents on fair, reasonable, and non-discriminatory (FRAND) terms. When courts are asked to adjudicate license disputes involving SEPs, they often calculate the implied aggregate royalty for all SEPs in the relevant standard associated with a potential license. We review five recently litigated FRAND cases and report the aggregate royalties for the 4G and 5G cellular standards that can be derived from these cases. We find that the aggregate royalty per mobile device in most of these decisions falls in a range from $3 to $16, with an average of $9.25. The aggregate royalty by the UK Court of Appeal in Optis/Apple is an outlier at $39.47.

IP & Innovation

When Numbers Overshadow Creativity: The Innovation Risks of Finance-Oriented CEOs

Kee-Hong Bae (York University – Schulich School of Business; European Corporate Governance Institute (ECGI))
Jung Chul Park (University of South Florida)
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6276839

This paper examines how CEOs' finance-related career experience is associated with corporate innovation. Using data from U.S. public firms, we show that firms led by CEOs with extensive finance experience invest less in innovation and exhibit lower innovation outcomes, as measured by patent valuation, patent counts, and R&D intensity. These results are robust to instrumental variable estimation and a range of alternative identification strategies. Our findings point to an important strategic trade-off: while finance-oriented leadership is associated with greater financial discipline, it is also linked to reduced investment in innovation, with implications for firms' longterm growth and competitiveness.

Human-Capital Shocks and Innovation: Evidence from Britain's Lost Generation

Luca Repetto (Uppsala University)
Davide Cipullo (Catholic University of the Sacred Heart of Milan)
Edward Pinchbeck (University of Birmingham; London School of Economics; Spatial Economics Research Centre (SERC))
Jan Bietenbeck (Lund University)
CESifo Working Paper No. 12529
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6363165

This paper studies how World War I mortality shocks to British communities affected long-run innovation. Linking parish-level military deaths to universal patent data (1895–1979) and inventor records, we compare high- and low-mortality areas. A 10 percent increase in deaths reduces the probability that a parish produces

any patent by 0.09–0.12 percentage points and the probability that a parish produces a breakthrough patent by three times as much. Mortality depresses both the entry of new inventors and the productivity of established ones, particularly in frontier and technologically complex fields. Mobility, collaboration, and stronger local innovation ecosystems mitigate these effects, albeit only partially.

Technology Life Cycles: Investment, Growth, and Firm Value

David Barkemeyer (University of Pennsylvania)
Jan Bena (University of British Columbia – Sauder School of Business)
Xiyue (Ellen) Li (Chinese University of Hong Kong, Shenzhen)
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6350538

We build a new century-long dataset of technology life cycles from USPTO patent titles, tracing 289 prominent technologies from initiation through emergence, prominence, and maturity over 1920-2023, and linking their patent histories to 9,047 global public firms. The earliest patents in prominent technologies are disproportionately influential and are primarily assigned to firms, especially large innovators. Decades before prominence, firms that patent early invest more, grow faster, and command higher valuation ratios. As technologies approach prominence, valuation premia compress even as profit margins and return on invested capital improve. After prominence, innovation becomes less foundational, pioneers' patent-share advantages erode only slowly on average, and the investment, growth, and valuation advantages of early participation fade or reverse. The erosion of early patent-share leadership is fastest when early competition among large innovators is intense.

Pharmaceutical Pricing

Qiang Liu (Mitchell E. Daniels, Jr School of Business, Purdue University)
Siyi Yu (Purdue University – Daniels School of Business)
Siqi Wen (Boston University – Questrom School of Business)
Yong Cai (Advanced Analytics)
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6367218

This chapter examines pharmaceutical pricing through a five-part framework: Cost, Customers, Channels, Competitors, and Compatibility. We synthesize how research and development (R&D) risk, patent and exclusivity rules, insurer design, healthcare providers, patients, and intermediaries including pharmacy benefit managers (PBMs), wholesalers, pharmacies, and group purchasing organizations (GPOs), jointly shape list and net prices. The chapter distinguishes small-molecule and biologic cost structures; explains how patents, generics, and biosimilars alter competitive conduct; and shows how formularies, cost-sharing, copay programs, and patient-assistance mechanisms reallocate spending. We also integrate recent policy interventions, including Medicare Part D reforms, transparency mandates, drug-importation rules, and the Inflation Reduction Act (IRA) negotiation authority, and discuss their implications for innovation incentives and patient access. The chapter concludes with a forward-looking research agenda focused on developing innovative pricing models for high-cost therapies; examining global benchmarking and trade policies that influence R&D investment and affordability; assessing the effects of patient-assistance programs, copay coupons, and digital discount platforms; analyzing intermediary behavior and biosimilar competition within evolving market structures; and evaluating the impact of new U.S. pricing regulations through causal policy analysis.

IP Law & Policy

Artificial Creators

Clark D. Asay (Brigham Young University – J. Reuben Clark Law School)
2 George Washington Journal of Law and Technology (forthcoming 2026)
BYU Law Research Paper No. 26-08
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6344598

Artificial intelligence systems cannot be inventors or authors under current U.S. law. On that point, the U.S. Patent and Trademark Office and the U.S. Copyright Office agree. Yet beyond that, the two regimes sharply diverge. The USPTO has adopted a more flexible approach to AI-assisted invention, permitting extensive AI involvement so long as a human being can be said to have conceived of the claimed invention. The Copyright Office, by contrast, has taken a far more restrictive stance, effectively denying registration to works whose expressive elements are generated by AI—even where humans engage in detailed, iterative prompting and exercise some amount of creative direction.

This Essay explores the reasons for that divergence and questions whether it is justified. While copyright's idea–expression dichotomy and independent creation requirement may appear to provide some justification for copyright law's more restrictive approach, those doctrines do not compel the Copyright Office's denial of copyright registration in AI-assisted works. Indeed, copyright law has long accommodated technologically mediated creativity—from photography to film—by focusing on human control and creative contribution rather than the mechanics of execution.

Drawing on patent law's conception requirement, as well as copyright doctrines governing joint authorship and derivative works, this Essay argues that copyrightability standards should move more in patent law's direction. Where a human meaningfully conceives of and directs the realization of a work—even if AI performs substantial expressive tasks—copyright law should recognize authorship at least to the extent of the human's creative contribution. Failing to do so risks undermining copyright's incentive structure and distorting the future development of creative industries in an era where AI assistance is increasingly ubiquitous.

Colonial Patents: Industrial Property Law and Nationality in Mandate Palestine

Michael Birnhack (Tel Aviv University – Buchmann Faculty of Law)
Journal of Legal History, forthcoming 2026
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6383879

This Article offers the first historical analysis of patent law in British Mandate Palestine (1917-1948), examining 4,395 patent applications through a reconstructed registry and archival sources. It develops Colonial Patents as a framework for analysing legal transplantation in colonial contexts.
The analysis reveals Britain's hybrid imperial patent policy: rejecting empire-wide unification while creating preferential procedures for British patents. Palestine's 1924 Patent Ordinance emerged from London-Jerusalem negotiations, including London's rejected proposal to abolish local patents. The registry shows profound participation asymmetries: while foreign and local inventors each filed approximately half of applications, Jewish inventors comprised nearly all local applicants, with scant Arab Palestinians filings. Archival sources confirm British engagement with Jewish patent agents but no Arab involvement. This disparity reflects patent law's ideological foundations in Enlightenment progress and industrial capitalism, which resonated with European-educated Jewish immigrants but remained peripheral to Arab Palestinian society, demonstrating how nominally neutral colonial institutions operated differentially.

PTAB Case Studies of AI Disclosure Requirements: Part I

Stephen M. Hou (American Patent Agency PC)
Maryann Rui (Massachusetts Institute of Technology (MIT) – Department of Electrical Engineering and Computer Science)
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6254899

Artificial intelligence (AI) is a fast-evolving field with new technical methods, systems, and products constantly being developed. This growth has also been reflected in the dramatic increase in patent filings for AI-related inventions. According to Patents and Artificial Intelligence: A Primer from the Center for Security and Emerging Technology, more than ten times as many AI-related patent applications were published worldwide in 2019 than in 2013, and the increasing trend has only continued since.

Although AI-related patent applications have been on the rise, explicit guidance on patentability requirements have only recently begun to be published by patent offices around the world. Indeed, as a burgeoning field of technology, AI inventions have unique features, such as the importance of training data and the lack of explainability and predictability of trained AI models, that differentiate such innovations from traditional types of computer-implemented inventions (CII).

These features raise questions about the interpretation of disclosure requirements, among other patentability requirements, for AI-related inventions. For example, how much information, such as source code, training data sets, or machine learning model architectures, should be provided to satisfy the written description and enablement requirements of Title 35 of the U.S. Code § 112(a) or analogs in other patent jurisdictions?

As we await further official guidance from the U.S. Patent & Trademark Office (USPTO) on disclosure requirements for AI-related inventions, we can gather initial indications from recent patent prosecution decisions from the Patent Trial & Appeal Board (PTAB) on such issues. In this article, we study a selection of PTAB appeals decisions for applications for AI-related inventions rejected under § 112. To set the background, we first review a classification of AI inventions and USPTO guidelines on disclosure requirements for computer-implemented inventions. After analyzing three case studies, we conclude with general takeaways and best practices, which emphasize that applicants must disclose specific algorithms and implementation details, not just desired outcomes, to satisfy written description requirements.

Whose Knowledge, Whose Cure? Traditional Medicine and the Boundaries of WIPO's 2024 Genetic Resources Treaty

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J World Intellect Prop. 2026;1–22
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6317438

Traditional medicine—including complementary, integrative, Indigenous, and ancestral practices—remains a vital source of healthcare for billions worldwide, particularly in the Global South. Despite its widespread use and biomedical relevance, traditional medicinal knowledge has long been excluded from dominant intellectual property systems shaped by Western legal traditions. This exclusion has enabled persistent biopiracy and inequitable commercialization of community-held knowledge. The 2024 WIPO Treaty on Intellectual Property, Genetic Resources, and Associated Traditional Knowledge marks a historic attempt to address these imbalances. It introduces mandatory disclosure of origin in patent applications and reaffirms the role of the intellectual property system in promoting innovation, knowledge transfer, and economic development—to the mutual benefit of providers and users of genetic resources and associated traditional knowledge. However, the treaty's effectiveness remains uncertain due to its narrow scope, vague provisions,

and reliance on national implementation. While analyses of the WIPO Treaty have largely focused on its disclosure requirements, legal enforceability, and implications for patent systems, relatively little attention has been paid to the treaty's implications for traditional medicines. Yet, traditional medicines represent one of the most significant areas where genetic resources and associated traditional knowledge intersect in practice. This paper critically evaluates the treaty's potential and limitations as applied to traditional medicine and advocates for a more justice-oriented, health aligned IP framework—one that centers Indigenous values, ensures equitable governance, and protects traditional medicine.

Copyright Law

On the Devolution of Copyright Scholarship: Part I-Tracing the Digital Copyright Revolution

Peter S. Menell (UC Berkeley School of Law)
UC Berkeley Public Law Research Paper Forthcoming
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6276780

As the digital revolution unfolded in the 1990s and early 2000s, a charismatic hacktivist faction took hold in the copyright legal academy. In its purest form, the copyleft movement celebrated the notion that "information wants to be free" and opposed copyright protection in cyberspace. Some copyleft scholars served as lead counsel in efforts to overturn copyright legislation and immunize filesharing enterprises from copyright liability, blurring the line between interpretive scholarship and policy analysis. Many academic amicus briefs took on the tactics of zealous advocates, selectively and misleadingly presenting empirical, statutory, and doctrinal analysis.

This Article chronicles the evolution of copyright law while tracing the devolution of copyright scholarship through this tumultuous era. It highlights the origins of the copyleft movement and ways in which many scholars lost sight of essential academic values-independence, objectivity, transparency, scrupulousness, methodological soundness, and analytical rigor-in an effort to persuade courts to remake copyright law through less than forthright and non-democratic means. In the process, they eroded the trust that courts had placed in the legal academy. As the Article shows, the courts have largely remained faithful to the rule of law in copyright cases and this has for the most part promoted cultural, social, and economic progress.

A follow-on article examines the chasm between judicial interpretation of copyright law and the views of many in the copyright academy through an empirical examination of Supreme Court academic briefs and anthropological analysis of the copyright legal academy. It then assesses the ramifications of the devolution of copyright scholarship for the judiciary, democratic institutions, the scholarly community, and society at large.

Defining the Character in Copyright Law

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Rachel Bamberger (American University Washington College of Law)
Forthcoming, 79 Stanford Law Review (2027)
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6312561

Copyright law gives special treatment to characters in narrative works. That special copyright protection has long been a source of controversy and legal uncertainty. But it also raises a threshold question, heretofore unanswered in doctrine and scholarship. What exactly is a character? Batman certainly is; what about his car? Freddie Krueger is plainly a character; what about his glove? Undertheorization of "characters" has invited courts to expand special character copyright protection rules to things decidedly not character-like, placing at stake millions of dollars, clashing creative forces, and arguably the very essence of copyright law.

This Article identifies the need for a test for characters, and offers such a test. Insofar as characters deserve special protection in copyright law, it is because characters are special in literature, and this Article leverages an exploration of literary theory to explain why. Literary theorists have long understood that characters are unique vehicles that readers can connect and identify with. To do so, characters must think and act like their (human) readers; that is, they must have mental personalities and agency to act upon their thoughts.

Agency and personality should be the qualifying test for characters in copyright law. Such a test is consistent with existing case law, and it renders copyright law consistent with the expectations of authors and readers. More importantly, it helps the larger ongoing controversies over copyright protection of characters. By restricting copyright law's special protection of characters to literary entities that are actually characters, the difficult questions surrounding such special protection are cabined to a narrow field where those questions are the most salient and least likely to result in unintended consequences. Ultimately, limiting character copyright protection to actual characters best promotes the underlying purposes of copyright law, namely the promotion of access to creative works.

Human-Required Originality: Copyright Eligibility in a Post-AI World

Ryan Whalen (The University of Hong Kong – Faculty of Law)
Forthcoming AIPLA Q.J. (Summer 2026)
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6340338

Generative artificial intelligence upends the assumptions that have anchored U.S. copyright law for more than a century. By enabling the production of high-quality expressive works at effectively zero marginal cost, GenAI destabilizes copyright's utilitarian foundation and exposes a deep incoherence in the originality requirement: the law grants exclusive rights to human-authored works that could have been produced just as easily—and at no cost—by modern generative systems, while denying protection to the machine-generated equivalents that render human effort unnecessary. At the same time, GenAI introduces a dynamic risk that existing doctrine is unequipped to address: as AI increasingly substitutes for human creators in markets characterized by commoditized content, human participation may collapse, starving future models of the novel, high-signal training data needed for continued aesthetic and cultural evolution. Left unaddressed, these twin pressures threaten both the theoretical coherence and the long-term creative vitality of the copyright system.

This Article argues that the core of the problem lies not in questions of infringement or AI authorship, but in copyright's threshold requirement: the "modicum of creativity" standard no longer filters works that require human incentives from those that do not. I propose a new, technologically grounded interpretation of originality—the human-required creativity standard—under which copyright protection attaches only to works that could not have been generated by state-of-the-art models with de minimis human input at the time of authorship or registration. This content-focused approach restores alignment between copyright's incentives and its constitutional purpose by denying protection to trivially generable works regardless of whether a human or a machine produced them, while continuing to protect works that demand meaningful human creative contribution.

A rebuttable presumption of eligibility and an affirmative defense of trivial generability make the human required standard administratively workable while preserving automatic copyright protection. The framework remains compatible with international treaty obligations, avoids prohibited formalities, and maps onto familiar originality and derivative-work doctrines. By grounding copyright eligibility in the realities of modern creative production, the human-required standard offers a path toward preserving human creativity, supporting sustainable innovation in AI, and re-anchoring copyright law in its fundamental task: promoting progress in the arts and sciences.

Recentering Creativity in Copyright Law Discourse

Joshua Yuvaraj (University of Auckland – Faculty of Law)
The University of Auckland Faculty of Law Research Paper Series 2026
(2026) 15 IP Theory (forthcoming)
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6364058

Copyright discourse often centers around creativity; as a rationale for copyright, and as a threshold for copyright to subsist in songs, books, art and other creative works. Yet creativity remains an ethereal concept: if we do not know what it means, we cannot evaluate whether copyright law is promoting it, nor can we properly understand what it means for a work to be "creative" where that is required for copyright to subsist. An emerging strand of copyright discourse seeks to respond by examining scientific insights into the cognitive process of creativity to highlight how copyright law should be reshaped to cultivate it. In this paper I develop that scholarship with an ontological analysis of copyright's relationship with creativity. Drawing on a recent meta-theory of creativity research, I demonstrate how creativity is phenomenological; that is, sociocultural and environmental factors are as important to creativity as individual cognitive processes. I then show that copyright law does not easily cohere with this phenomenological view of creativity: it has no role in some elements and is structured as to stymy others. While this analysis adds a further basis to the argument that we should not consider copyright law as a creativity-promoting legal framework, I use social contract theory to show that copyright can be regarded as having a secondary, facilitative role in the phenomenon of creativity. This analysis provides the theoretical framework for further research in three areas: (a) it challenges copyright expansionism; (b) it encourages examination of avenues to promote creativity beyond copyright law; and (c) it suggests the provision of property rights in respect of intellectual creations under copyright law should be revisited.

IP & Trade

Public Interest Protection under Patent Regimes: Analysing the Consistency of Section 3(d) of the Indian Patent Act with TRIPS as a Substantive Model for African Countries

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Emmanuel Adu Amankwah (Kwame Nkrumah University of Science and Technology, Ghana)
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Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6241459

The patent system presumes an intention that the protection of patents should stimulate innovations to promote socioeconomic welfare. Notwithstanding this, the TRIPS Agreement holds a general notion that patentees may abuse the patent system or resort to unreasonable practices. On this premise, the Agreement maintains a basic principle that preserves the underlying public policy objectives of members' discretion to adopt consistent measures necessary to protect the public interest. Nevertheless, the patent legislative landscape in Africa is commonly short of any legal prudence on public interest protection, while in following the letter of TRIPS, India incorporates under Section 3(d) in its patent regime a norm that the mere discovery of a new form of a known substance that does not result in the enhancement of the known substance's efficacy shall be refused a patent. Significantly, the well-established patent administration office and the Indian judiciary have invoked this provision to promote legitimate public interests, except that some still disputably question the legitimacy of Section 3(d) in the light of TRIPS. It is on this basis that this article draws on the legislative scope of Section 3(d) and analyses it statutory intent, context and usefulness under WTO law pursuant to the public interest protection, and questions whether it complies with TRIPS,

particularly Article 27(1), which in part stipulates that patents shall be available for any inventions provided that they are new, involve an inventive step and are capable of industrial application. Having established the consistency and validity of Section 3(d) with TRIPS, the authors conclude that nothing in the light of TRIPS would, in fact, preclude the possibility of African countries exploring and implementing models similar to Section 3(d) to prevent abuse of the patent system. This conclusion is founded on the normative logic that every system needs checks and balances, and the patent system is no exception; moreover, the promotion of legitimate public interests itself is a central principle within the framework of TRIPS as reflected in the Agreement and, historically, members' legislative practices.

Other Topics

Patents and Advertising

Enrico Bonadio (City University London, The City Law School)
Gursharan Kaur Gursharan Kaur (St. George's University of London)
in Alexandros Antoniou (ed.), Research Handbook in Advertising Law (Elgar forthcoming 2026)
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6344678

The strategic use of patents within marketing and advertising has emerged as a potent tool as companies vie for consumer attention in competitive markets. This chapter observes the evolving use of patents as a component of advertising strategy across a range of industries and how they impact purchase decisions. It argues that patents serve not only as legal protections but also as instruments for enhancing specific product credibility. By actively communicating patent protection to the market, companies seek to underscore their commitment to innovation and foster consumer trust. In this context, the patent operates beyond its traditional legal function, contributing to brand reputation and perceived transparency. In other words, such intellectual property right transcends its legal role by elevating the reputation of a brand.

The Changing Geography of the International Diffusion of Technological Knowledge

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Michele Pezzoni (Université Côte d'Azur)
Fabiana Visentin (Maastricht University; UNU-MERIT)
Catalina Martínez (Spanish Council for Scientific Research (CSIC) – Institute of Public Goods and Policies (IPP))
Reinhilde Veugelers (KU Leuven)
Julio D. Raffo (World Intellectual Property Organization (WIPO))
World Intellectual Property Organization (WIPO) Economic Research Working Paper Series No. 92
https://doi.org/10.34667/tind.59304

This paper examines the evolving geography of international technological knowledge diffusion over the last four decades using multiple patent-based indicators. We first review the main mechanisms through which knowledge diffuses across borders—including trade and global value chains, foreign direct investment, skilled migration, global science, and markets for technology—highlighting their complementarities and the role of domestic capabilities. We then provide new empirical evidence based on cross-border patent citations, technological trajectories defined by IPC recombinations, patent-to-science linkages, and international patent families. The results reveal persistent asymmetries, with a small group of advanced economies remaining central knowledge hubs, alongside the rising role of emerging countries, especially China. Science-based technologies diffuse farther and faster, while capability constraints continue to limit integration for many regions.

Global Knowledge Flows in High-Tech Sectors: Evidence from Patents

Le Tang (Department of Economics, Suffolk University)
Jared Head (Suffolk University)
Working paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6270559

This study examines international knowledge flows in self-driving, electric vehicle, and semiconductor technologies using global patent data from 2010 to 2024. Chinese patenting grew rapidly, making China the largest contributor in these sectors. Despite this growth in patenting volume, a large share of influential patents continue to originate from firms headquartered in the United States, Japan, Germany, and South Korea. Across all three technologies, Chinese inventors receive relatively fewer citations from foreign inventors, indicating limited global diffusion of Chinese-origin knowledge. In contrast, patents from the United States and Japan are widely cited across countries, consistent with their role as central sources of globally-diffused knowledge. After 2018, following trade tensions between the U.S. and China, bilateral knowledge exchange increased, particularly through the intangible knowledge embedded in patents. Overall, the evidence indicates that the two countries increasingly rely on each other's intangible knowledge rather than physical technologies.

Going Green Like China

Wenxi Jiang (The Chinese University of Hong Kong (CUHK))
Xinyi Shao (Renmin University of China – School of Finance)
Working Paper
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=6435520

China has become the world's leading producer and innovator in renewable energy technologies, accounting for over 80% of global green patent filings. This paper examines how China's hybrid system-state-owned electricity enterprises dominating downstream and private firms manufacturing upstream equipments-has driven this transition. National renewable energy targets, enforced through career incentives for SOE managers, create strong and predictable downstream demand that stimulates upstream innovation. Using global supplier-customer pair-level data, we show that revenue growth among Chinese downstream customers is significantly associated with their suppliers' subsequent patenting, whereas this effect is absent for non-Chinese customers. Exploiting the 2022 clearance of feed-in tariff subsidy arrears to electricity firms as a demand shock provides causal evidence. Direct subsidies to suppliers have no significant effect, but subsidies to fast-growing downstream customers do. Finally, this arrangement also induces overinvestment and excess capacity among suppliers.

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