



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 & Licensing

Cloud Gaming Demystified: An Introduction to the Legal Implications of Cloud-Based Video Games

Mitchell Longan (Birmingham City University – Faculty of Business, Law and Social Sciences; Queen Mary University of London – Centre for Commercial Law Studies (CCLS))

Gaetano Dimita (Queen Mary University of London, School of Law – Centre for Commercial Law Studies)

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Queen Mary Law Research Paper No. 369/2021

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3949611

In this paper, we set out to ‘demystify’ cloud-based videogaming and its legal implications. We do this in two stages. First, we offer a descriptive analysis of the videogame sector, including relevant markets and supply chains. We explain the basics of cloud computing technology, traditional videogame technology, and how the two converge in cloud-based videogame ecosystems. We also analyze market structures for both the cloud and video game industries, as well as relevant supply chains, in order to understand how these markets will overlap. Based on these analyses, we make predictions about how the cloud gaming market will be structured, including a breakdown of three separate models for cloud gaming services: the ‘layered’ model of Gaming-as-a-Service (‘GaaS’), the ‘integrated’ model of GaaS, and the ‘consumer infrastructure-as-a-service’ model. Finally, we use these three models to analyze how certain intellectual property rights, contractual rights, and regulatory issues will develop in this novel environment for videogame distribution and access.

Fostering of Patent Pools Covering Cable Technology: Lessons from VVC Pool Fostering

Carter Eltzroth (Helikon.net)

Jud Cary (SCTE)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3949545

Patent pools are increasingly well known as a mechanism to license patents essential to a technical standard. CableLabs had early experience when it launched in the mid-1990s the first modern day pool covering MPEG2-essential video codec patents. Recently, the fractured licensing environment for the video codec HEVC brought many industry players to look for greater clarity for licensing of the newly

adopted ISO/IEC MPEG video codec, Versatile Video Coding (VVC). Earlier this year, the Media Coding Industry Forum (MC-IF) completed its fostering of pool formation covering VVC-essential patents.

MC-IF's sponsorship of pool fostering was based in part on the experience of the DVB Project in fostering pools essential to DVB standards. MC-IF scaled DVB's process to meet the challenges of the VVC patent environment: dozens of holders with diverse business models drawn from the audiovisual industry, but also from other widely divergent industries. Some based their revenues wholly on collection of royalties; others largely on sales of devices and services (while owning one or more VVC-essential patents). After providing background to DVB's success in pool fostering, the paper explains the process adopted by VVC Pool Fostering; the steps used to broaden participation and encourage engagement; and the final outcome of pool fostering for VVC-essential patents. While VVC Pool Fostering did not achieve a goal shared by many participants – the selection of a single licensing administrator to complete VVC pool formation – it confirmed pool fostering as a useful tool “to kickstart” licensing of newly adopted standards. The paper draws upon the experience of the two convenors of VVC Pool Fostering. The paper compares the patent pool model with the licensing regimes covering other video codecs contending today for broad industry adoption. Pool fostering described in this paper is available for different technologies implemented by cable operators or used in cable households: standardised technologies adopted in TV receivers (such as video codecs) and set top boxes, audiovisual transmission and general telecommunications protocols; *etc.*

IP & Litigation

An Empirical Test of Patent Hold-Out Theory: Evidence from Litigation of Standard Essential Patents

Christian Helmers (Universidad Carlos III de Madrid; Santa Clara University – Leavey School of Business)

Brian J. Love (Santa Clara University School of Law)

Santa Clara Univ. Legal Studies Research Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3950060

The theory of patent “hold-out” posits that frictions in the market for licensing standard-essential patents (SEPs) provide incentive for prospective licensees to opportunistically delay taking licenses. We derive empirically testable predictions from the literature supporting hold-out theory—namely that hold-out should be positively associated with the size and international breadth of licensors’ SEP portfolios, but negatively associated with the “quality” of licensors’ SEPs—and we test those predictions using measures of pre- and in-litigation hold-out constructed from information disclosed in U.S. SEP cases filed 2010-2019. We find some evidence of an association between in-litigation hold-out and both SEP portfolio size and patent quality; however, we find no evidence associating pre- or in-litigation hold-out with the international breadth of SEP rights. Overall, our results provide little empirical support for hold-out theory, particularly in the context of pre-litigation licensing negotiations, which are the literature’s primary focus to date.

Injunctions, Firm Value, and Technology Commercialization

Frederick L. Bereskin (University of Missouri)

Po-Hsuan Hsu (National Tsing Hua University)

Huijun Wang (Auburn University; University of Melbourne)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3965612

Routinely granted injunctions during patent lawsuits have been regarded as a significant obstacle to firm innovation. We use the 2006 Supreme Court ruling in *eBay v. MercExchange* that reduced injunction likelihood in cases related to information and communications technology (ICT) patents to examine the

effects of injunction likelihood on firms' stock prices, operating performance, and technology commercialization. We find that affected firms' stock prices react more favorably to patent litigation following the eBay ruling. Relatedly, we find that firms that are subject to reduced injunction likelihood experience better profitability and faster technology commercialization.

Of Artificial Intelligence and Patent Litigation

Jasper L. Tran (Milbank LLP)

Journal of the Patent and Trademark Office Society, Vol. 102, 2022 symposium

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3964808

Just as AI enables computers to perform increasingly complex tasks, it, however, also raises a host of novel issues at its intersection with the law, including issues for litigants in patent infringement suits. The investment in AI technologies likely will lead to an increase in AI-related patent litigation, and the introduction of a nonhuman actor into a traditional patent infringement analysis means that litigants will face unique issues stemming from the dynamic nature of AI technology. From whom and where to sue, to investigating, pleading and (dis)proving infringement, patent owners and accused infringers alike will need to adopt new strategies to confront the challenges posed by the latest frontier in patent litigation. This essay explores these AI-related patent litigation issues in depth. To wit, Parts I–IV seek to raise issues concerning four basic questions pertinent to AI-related patent infringement cases: (I) who exactly is the infringer?, (II) where is the infringer located?, (III) how is infringement pled?, and (IV) how is infringement proven?

IP & Innovation

Technological Obsolescence

Song Ma (Yale School of Management; National Bureau of Economic Research (NBER))

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3964128

This paper proposes a new measure of technological obsolescence using detailed patent data. Using this measure, we present two sets of results. First, firms' technological obsolescence foreshadows substantially lower growth, productivity, and reallocation of capital. This finding applies mainly for obsolescence of core innovation and embodied innovation, and it is stronger in competitive product markets. Second, in stock markets, high-obsolescence firms under-perform low-obsolescence firms by 7 percent annually. Using analyst forecast data, we show this is due to a systematic overestimation of future profits of obsolescent firms. The measure contains incremental information about firm innovation relative to measures focusing on new innovation.

An Empirical Equilibrium Model of the Brokered Market for Patents

Paul P. Momtaz (University of California, Los Angeles (UCLA) – Anderson School of Management; University College London Center for Blockchain Technologies)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3952758

Active markets for intellectual property (IP) are desirable because they facilitate the reallocation of new inventions to those who can best commercialize them. Therefore, active IP markets provide an incentive for inventors and specialized startups to invent in the first place, which promotes economic growth. However, IP markets are thought to be relatively inefficient. They are mostly decentralized and opaque markets, with substantial search frictions. Although non-practicing entities (NPEs) play an intermediary role to reduce such frictions, their operations are costly and their net effect on innovation and the IP market's efficiency is unclear. Against this background, I structurally estimate a search-and-bargaining model of the brokered patent market. The model suggests that, compared to the Walrasian benchmark,

the brokered patent market is relatively inefficient and NPEs' net effect on patent market efficiency is negative.

Tax Accounting Research on Corporate Investment: A Discussion of The Impact of IP Box Regimes on the M&A Market by Bradley, Ruf, and Robinson

Rebecca Lester (Stanford Graduate School of Business)

Journal of Accounting & Economics (JAE), Forthcoming

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3936809

In "The Impact of IP Box Regimes on the M&A Market," Bradley, Robinson, and Ruf (2021) study whether and to what extent tax incentives for intellectual property affect corporate M&A investment activity. The paper finds that a 1.0 percentage point tax benefit leads to a 1.2% increase in M&A activity in a country after the implementation of an Intellectual Property (IP) Box tax regime. Results vary based on country-specific IP Box requirements, as well as firm-specific characteristics such as patent ownership and acquirer nationality. My discussion offers more cautious interpretations of the empirical results related to statutory country-specific requirements of these regimes and raises concerns about the type and timing of firm responses. More generally, I outline how this paper and other work by tax researchers in Accounting contributes to the broader literature studying the relation between corporate tax policies and investment activity.

Information Leakage, Imitation, and the Patent System

Dirk Czarnitzki (KU Leuven – Department of Managerial Economics, Strategy, and Innovation)

Kristof Van Criekingen (Aarhus University – The Danish Institute for Studies in Research and Research Policy; KU Leuven – Department of Managerial Economics, Strategy, and Innovation)

ZEW – Centre for European Economic Research Discussion Paper No. 21-072

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3949797

From a firm's perspective two competing forces are driving the decision to invest in innovation. On the one hand, innovative performance is an important driver of profitability and growth. On the other hand, investments in innovation suffer from negative externalities, *i.e.* spillovers to other firms, and hence imitation could be induced. To preempt imitation firms may protect their inventions by means of intellectual property rights, such as patents. By taking out a patent, however, a firm also conveys information about the functioning of the invention to competitors. In this empirical paper, we highlight the trade-off of patenting by setting up a recursive system of equations on knowledge leakage and imitation that, among other factors, may be partly determined by firms' patenting activity. Thereby we contribute to the debate on the functioning of the contemporary patent system. We find that patenting firms are being less confronted with imitation. The effect of patents on the dissemination of R&D findings is, however, insignificant. Therefore, we conclude that patent disclosures do not significantly harm the appropriability conditions for inventions, but help to protect, at least partly, against imitation, as it has been originally envisaged by policy.

IP Law & Policy

The Patent Trial and Appeal Board – A Second Constitutional Challenge

Gregory Curfman (American Medical Association)

Jonathan J. Darrow (Harvard Medical School)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3926112

The Patent Trial and Appeal Board, which resides within the United States Patent and Trademark Office, is authorized to cancel patents that it concludes were issued inappropriately. The Board was conceived by Congress and defined in a provision of the 2011 America Invents Act; it was meant to

provide an alternative to litigation in Article III courts to challenge the validity of patents. Reviews of patent validity by the Board are an important part of the pathway by which generic drugs and biosimilars may efficiently reach the market. Since 2018, the Patent Trial and Appeal Board, and one of the key procedures it utilizes to assess the validity of patents, referred to as inter partes review, have been the subject of two separate constitutional challenges before the Supreme Court. This article analyzes the legal bases for the two constitutional challenges (with particular emphasis on the second challenge) and discusses the reasons why the Patent Trial and Appeal Board survived both. The article also assesses the importance of the Board and inter partes review to the generic drug and biosimilar industries and concludes with a discussion of the implications of the constitutional challenges for prescription drug patent law.

Copyright Law

Who Killed the Radio Star? How Music Blanket Licensing Distorts the Production of Creative Content in Radio

Ariel Katz (University of Toronto – Faculty of Law)

Eden Sarid (University of Essex – School of Law)

American University Law Review, Vol. 71, 2021

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3950433

According to popular and scholarly belief, video killed the radio star. The golden age of radio, culminating in the 1930s and 1940s, was gone with the rise of television in the 1950s and 1960s. In this Article, we advance the claim that television's role in the "death" of the radio star has been more limited than commonly believed. A major culprit, we argue, is the common licensing practice of musical content for broadcasting, or more precisely, the blanket license issued by copyright collective management organizations (CMOs). By setting a zero marginal price for broadcasting additional songs from the CMO's repertoire, CMOs' blanket licensing drives commercial radio stations to dedicate a larger portion of their programming to the broadcasting of recorded songs and to reduce the time and resources spent on producing or procuring other content.

This Article makes three main contributions to three fields: competition law and policy; copyright law and policy; and cultural history. For competition law and policy, this Article reveals that the analysis of blanket licenses should not be limited to their static effects (*i.e.*, the trade-off between lower transaction costs and supra-competitive pricing), but should also include the dynamic effect of blanket licensing on the type and quality of content production. This dynamic effect also poses a challenge for copyright law and policy: while collective licensing may be beneficial to one class of copyright holders, it may hinder the production of other content and harm creators of such content, by depriving them of important opportunities for market and cultural participation. Regarding cultural history, our Article provides a novel explanation for the well-documented phenomenon of the "death" of the radio star and re-evaluates some of the existing explanations. Finally, we discuss some alternative models for music licensing that can mitigate the distortion created by blanket licenses.

Private Equity Acquisitions and Product Market Decisions: Evidence from Trademarks

Moazzam Khoja (University of Houston)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3957554

Private equity (PE) acquisitions of public firms are heavily financed by debt, and they seek an exit in a short horizon after the turnaround. They reduce agency costs through management ownership. Due to short investment windows, large debt burdens, and reduced agency costs, these acquired firms may reduce product innovation due to cash-flow constraints or course-correction of prior over-spent. In this paper, I use trademark data to study the product market decisions of PE targets. I find that firms reduce

the trademarks of existing products post-acquisition, with no significant effect on new products. Additionally, the trademarks for existing products are filed in more concentrated product classes. While deal leverage does not impact this behavior, deals involving higher management cashouts are less likely to see this reduction.

With Eyes to See and Ears to Beer: Navigating Multisensory Intellectual Property Rights in the Craft Beer Industry

Mark Edward Blankenship Jr. (Yeshiva University, Benjamin N. Cardozo School of Law)

21 Wake Forest J. Bus. & Intell. Prop. L. 395 (2021)

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3939068

Gastrophysics is an interdisciplinary science that aims to uncover how the sensory input relates to the material composition and properties of food and its absorption in the human body. Within the field is a newly developed concept called sonic seasoning, which is the cross-modal relationship between one's perception of taste and the sounds that person hears. The concept of sonic seasoning was facilitated by changing attitudes in music and innovative perspectives of musical notation throughout history. Furthermore, new discoveries on music's effects on the senses have led to numerous brands across the globe to develop multisensory craft beers and other alcoholic beverages as a way of attracting consumers.

The biggest obstacle is determining which area of intellectual property is the best form of protection for multisensory goods that create sonic seasoning effects, especially in the highly saturated craft beer industry. The infusion of music into these kinds of goods can lead to copyright, trade secret, and trademark complications. In selecting the best approach, lawyers need to additionally take into consideration what is best for not only consumers, but the musicians and copyright holders of the music that is used to create such cross-modal effects. Another factor to consider is that the science behind these cross-modal effects is still being researched.

A Typology of Disclosure

Sharon K. Sandeen (Mitchell Hamline School of Law; Hanken School of Economics)

Akron Law Review, *Forthcoming*

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3950769

Information and data have always been valuable to businesses, but in the Information Age, as businesses have figured out more ways to commoditize the information and data they possess, there has been a corresponding increase in expressed concerns about the unauthorized "disclosure" of information. Often, these concerns are expressed in absolute terms, as if any unauthorized disclosure of information constitutes an act of unfair competition or theft. The problem is that the common understanding of disclosure, particularly among information owners that seek to restrict access to the information they possess, belies the legal meaning of the term as used in various contexts.

Sometimes, but not as often as information owners/possessors assert, the disclosure of information will result in the loss of associated rights in the information, but other times it will not. This can happen, for instance, when no legal rights attach to a specified body of information, or when any rights that do attach (like copyrights) continue to exist even if there is a disclosure of the information.

Because different areas of information law have developed different meanings of the term disclosure (and related terms, like "publication"), it is important for scholars, courts, and litigants to understand those meanings and use them properly. Otherwise, there is a risk that claims of wrongful disclosure of information will unduly influence policymakers and judges to favor the claims of information owners/possessors over those who are entitled to access and use the subject information. In other words, the limitations that exist on the scope of various information rights should not be overshadowed by the rhetoric of loss and theft when no such loss or theft is possible.

This article begins by first illustrating the different ways that the term “disclosure” is used in law, using trade secret law, patent law, and copyright law as case studies. It concludes by setting forth a typology of disclosure that should be used to explain the legal consequences of acts of disclosure for various types of information. Only Type-L disclosures (those that result in the loss of associated information rights) fit the rhetoric of information owners/possessors.

IP & Trade

The Role of Customary International Law in Intellectual Property Protection Beyond Borders

Henning Grosse Ruse-Khan (University of Cambridge Fellow, King's College Cambridge; University of Cambridge; Max Planck Institute for Innovation and Competition)

University of Cambridge Faculty of Law Research Paper No. 29/2021

The Role of Customary International Law in Intellectual Property Protection beyond Borders, in A Metzger & H Grosse Ruse-Khan, Intellectual Property Protection Beyond Borders, Cambridge University Press (forthcoming, 2022)

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3957449

This paper considers the role of customary international law for the protection of intellectual property (IP) beyond borders. As an area where standards of protection are primarily, if not exclusively, governed by treaty law there seems to be little role left for custom. The analysis shows that this holds true for principles or rules committing states to a particular form of protecting the rights of foreign IP owners. However, the interpretation, application and enforcement of these rules is informed by other areas of public international law, including those governed by custom. After reviewing this often neglected role of customary international law for IP protection in general, the paper focuses on the customary right to regulate and its role in neighbouring areas of international economic law - in particular the protection for foreign investments. Exploring the contours and limits of this right, the main research question then is whether – and if so, how – this right applies to treaty commitments in relation to the protection of IP rights. I conclude that despite a complex web of treaty-based rules, there is usually no specific evidence that the state parties intended to ‘contract out’ of the right to regulate - an aspect further confined by reference to this right in the Doha Declaration on TRIPS and Public Health. A broader point is to emphasise custom as a necessary contextual factor of the environment within which international IP law operates: it is a relevant element simply because coordinating protection beyond borders is often relying on the functionality and tools of international law.

Other Topics

The Environmental Impact of Green Innovation

Ming Gao (Peking University, School of Software and Microelectronics)

Xuelin Li (University of South Carolina – Darla Moore School of Business)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3955402

We study the environmental impact of green innovations by combining detailed firm-level toxic release data with patent-level measures of environmental technologies. To address the endogeneity concerns and measurement problems, we obtain patent-level exposures to the Green Technology Pilot Program. We document robust evidence that green innovations significantly reduce the developing firm's pollution in a nine-year window after patent filing dates. The environmental benefit of these technologies positively correlates with their relevance to previous green innovations, and increases with the firm's pollution tendencies and intangible capital. However, external environmental pressures decrease these

innovations' effectiveness, and non-green technologies may generate environmental costs by releasing toxic chemicals.

Winner Takes All? Tech Clusters, Population Centers, and the Spatial Transformation of U.S. Invention

Brad Chattergoon (Harvard University)

William R. Kerr (Harvard University)

Working Paper

<https://www.nber.org/papers/w29456>

U.S. invention has become increasingly concentrated around major tech centers since the 1970s, with implications for how much cities across the country share in concomitant local benefits. Is invention becoming a winner-takes-all race? We explore the rising spatial concentration of patents and identify an underlying stability in their distribution. Software patents have exploded to account for about half of patents today, and these patents are highly concentrated in tech centers. Tech centers also account for a growing share of non-software patents, but the reallocation, by contrast, is entirely from the five largest population centers in 1980. Non-software patenting is stable for most cities, with anchor tenants like universities playing important roles, suggesting the growing concentration of invention may be nearing its end. Immigrant inventors and new businesses aided in the spatial transformation.

Retro-Validation Approach for Deducing Vacant Technology in the Biopharmaceutical Field Using Unstructured Patent Data

Siwoo Kim (CHA University)

Youngbo Choi (Chungbuk National University)

Surin Hong (CHA University)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3967110

Establishing directions for R&D management and strategy for the development of technology based on scientific evidence through the evaluation of objective data has been a major issue. Patent documents can be used as a data source for forecasting technologies; however, there have been almost no attempts to exploit the unstructured data of patents for utilization in deep patent analysis, owing to the limitations in various areas of expertise such as textual data mining, technological interpreting, clustering, and evaluating patents. This study proposes a novel retro-validation analytical method which uses patent unstructured data for the deduction of vacant technologies based on commercial advancement in the technological field, which is deduced by the substitution of technology trees and distributions in the field of previously achieved commercial advancements, to that in the field of low commercial advancement. Detailed vacant technologies can be deduced in the fields of stem cell and gene therapy as target technologies when the proposed method is applied to the biopharmaceutical field for verification, thus presenting significant R&D trends which can be applied to forecast future practical issues.

The Importance of IP-Intensive Manufacturing Industries to the U.S. Economy

Nam Pham (George Washington University)

Working Paper

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3950731

Recently updated R&D and economic performance data once again confirm the crucial contributions of innovation to productivity and long-term economic growth, while reinforcing the importance of protecting intellectual property (IP) to innovation. IP-intensive (or “innovative”) industries continue to commit more resources to R&D and outperform non-IP-intensive industries across key economic measures. Workers in innovative industries punch well above their weight, creating more economic value and, accordingly, earning higher wages than their counterparts in other manufacturing industries. Firms in IP-intensive industries cut fewer jobs during economic contractions and add more jobs during economic expansions

than their counterparts in non-IP-intensive industries. Given the well-established relationship between R&D and innovation and between innovation and economic growth, public policies should continue to underpin this IP ecosystem by ensuring the preservation of robust IP protections.

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*The editor would like to acknowledge the contributions of **Arun Maganti**.*

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