

[Draft – updated June 26, 2016]

Shadow Patent Systems Technology, Economics, and Geopolitics

*Brian Kahin*¹

Revision of Thinkpiece for Mega-Regionalism Workshop
East-West Center
January 20-21, 2016

“IP rights are the global currency for creating value for products and services, for all innovators, in all markets.”

*Under Secretary of Commerce for Intellectual Property David Kappos*²

The vision expressed by the former Under Secretary Kappos reflects an aspiration of commoditization and liquidity that would bind patents to the vast resources of global finance. But whereas currency is the ultimate commodity, patents are by definition unique expressions of new knowledge. Each dollar is the same as every dollar, and all can be aggregated in a purely linear manner. By definition, a patent cannot be the same as another patent. Furthermore, it takes time and resources to find out whether the patents are valid -- and then whether and how they are infringed by particular technology.

Moreover, in a world economy characterized by specialization, global value chains, and high volumes of trade across borders, intellectual property rights remain territorial. In the case of patents in particular, states play many different roles. They design patent rights, evaluate applications, issue patents, enforce patent rights, and award damages, but they have been reluctant to require reporting on business uses and behavior once the patent is granted.

In the past six years, certain major governments have begun supporting, directly or indirectly, the ownership and aggregation of patents. This interest in patent aggregation takes the form of “sovereign patent funds,” implying full state ownership and control analogous to sovereign wealth funds. In practice, there are prospects for state investment far beyond the state-owned dedicated patent fund -- sovereign wealth funds, development banks, and portfolio-wielding state-

¹ Address correspondence to kahin@wyoming.com with copies to bkahin@ccianet.org. The views expressed in this paper are solely those of the author. This work has benefited from presentations at the Harvard Business School Digital Initiative, [March 26, 2014](#), and the Mega-Regionalism workshop at the East-West Center, January 21, 2016, along with feedback received from colleagues too numerous to mention. The author also thanks the MIT Initiative on the Digital Economy and the Visiting Scholars Program at the University of Washington School of Law.

² [Speech](#) at the Center for American Progress, November 20, 2012

owned/state-invested enterprises. States may act much like private investors. Directly or indirectly, they may invest in patents they have issued – or in patents issued by other governments, just as they may hold foreign currency in reserves or invest in foreign real estate or CDOs.

Financialization begins with accepting patents as collateral for loans to start-up businesses. This is not problematic if there is a clearly identified revenue stream from licensing. If that is not case, patent valuation becomes extremely difficult, and expert opinion can differ by several orders of magnitude.³ In secondary markets, where patents are traded independent of any particular business context, value is largely dependent on “evidence of use” – in other words, knowing that a producing company has made irreversible sunk investments in technology infringing the patent and is therefore vulnerable to patent assertion.

Patent value is ultimately determined by the size of the market protected by the patent (making U.S. patents most valuable), the exposure of producing firms to the patent, and the “strength” of patents in that jurisdiction. The latter is measured in terms of factors that favor patent owners over producers, such as the availability of injunctions. At the same time, there may be uncertainty because further expenditures by the defendant may find that somewhere in the wider world there is prior art that can defeat the patent – or other issues that can undermine the patentee’s legal position. In the case of a well-resourced defendant with much at risk (including a reputation for being an easy mark), the patent owner may face a “scorched earth” defense that small defendants, especially startups, could not possibly afford. (In many cases therefore, it may be more advantageous to assert patents against small defendants, relying on the substantial transaction costs of the patent system as a weapon apart from the quality and value of the patent.)

Viewing state investment in patents in financial terms emphasizes the option value of patents – the fact that they can be used for a variety of purposes. For example, the French sovereign patent fund, France Brevets, was announced as a vehicle for commercializing French and European developed technology – much the role that Bayh-Dole is designed to serve for publicly funded research in U.S. universities. This stated goal does not preclude France Brevets from using patents for other purposes, including raising money from the assertion or sale of its patents, whether in the name of furthering its original goal or, as a reputational matter, ensuring that its patents are accorded respect.⁴ SPFs can enter into alliances with private firms, possibly helping to insulate such alliances from scrutiny by competition agencies. They may also serve as licensing agencies for

³ Testimony of Chip Lutton, Apple, at FTC hearing on evolving IP marketplace, University of California, Berkeley, May 4 2009.

⁴ France Brevet’s initial lawsuits were eye-opening because they took place not in France but in Germany and the U.S. (asserting German and American patents) against companies from Taiwan and South Korea. See Joff Wild, [France’s sovereign patent fund takes aim at LG and HTC in the US and Germany](#), IAM Blog, Dec 9, 2013

small firms within their home region (or elsewhere).⁵ Moreover, nothing precludes SPFs from taking positions on policy, and they can be expected to lobby in favor of their business. In January 2016, France Brevets [announced](#) its leadership of a policy consortium designed to counter the new IEEE policy on rules for standard-essential patents. In short, France Brevets and its European allies are taking on the U.S. Department of Justice, which has said that the new IEEE rules have “the potential to benefit competition and consumers by facilitating licensing negotiations, mitigating hold up and royalty stacking, and promoting competition among technologies for inclusion in standards.”⁶

This new point mode of state intervention further muddies the international waters on patent policy. More fundamentally, there are common misapprehensions of the nature of the patent right, let alone the nature of patent portfolios. For example, in an article in the Stanford Technology Law Review, Mr. Kappos writes:

The U.S. has had a 230-plus year love affair with innovation. It started with our Constitution, in which our Founding Fathers made patents an affirmative right the government is required to grant to anyone who meets the legal requirements.

This is doubly wrong. Patents are not constitutionally required. Granting patents is simply one of the enumerated powers of the federal government – i.e., areas where Congress may legislate if it chooses.⁷

Patents are negative rights.⁸ They do not authorize the inventor to exploit an invention. Instead, patents allow their owners to exclude others from using the invention, assuming that the patent is valid. In effect, a patent is an exotic instrument in the nature of an option to sue. Its value ultimately lies in its ability to construct a protective barrier -- or to find and target an infringer who can be made to pay. In digital technology, an individual patent can often be designed around, and the barrier function is more effective at a portfolio level where patents can serve as thickets that limit “freedom to operate” by preventing or inhibiting use of large swaths of complementary or adjacent technologies and resources.

At either level (individual patent or portfolio), this is analogous to a trade barrier that protects against importation. In doctrinal terms, the ability to exclude is justified on the basis of dynamic efficiency: Blocking competition for a period provides an incentive to make investments in invention or complementary assets that will pay off over the long term. This rationale is in turn analogous to the

⁵ See <http://www.smartinsights.net/Secure-Transactions-News/Inside-Secure-wins-a-patent-infringement-case-against-HTC>

⁶ See Jorge Contreras, [IEEE Amends its Patent \(FRAND\) Policy](#), Patently-O, Feb. 9, 2015

⁷ “The Congress shall have the power.... To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.” (Article I Section 8)

⁸ “Patents confer negative rights, i.e. the right to exclude the making, selling, or using of the claimed subject matter.” <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC526265/#fn1>

argument for protecting infant industries from competition through tariffs – a time-honored practice extending back to the principles propounded by Alexander Hamilton in his *Report on Manufactures* and promoted as the “American System” by Henry Clay.⁹

While strategic barriers can be monitored reasonably well at the level of tariffs and trade, the strategic uses and effects of both patents and patent portfolios remain confidential business information despite the public nature of the underlying patent instruments. This makes it difficult to separate out and piece together meaningful information on licensing that represents real technology flows -- distinct from transfer pricing among affiliated firms, settlements of legal claims that do not involve technology transfer, speculative transactions, the licensing of other forms of intellectual property, cross-licenses and non-assertion agreements, etc.¹⁰

In these shadow markets, patent owners are free to use patents secretly in ways that may or may not serve competition policies and the long-term economic goals of the system. Concerns have recently been raised about what is visible, such as South Korea’s negative balance in international licensing,¹¹ but there is no forum for probing deeper into the factors, imbalances, and differences in practice that shape international flows in patent rights – or the issues around state participation in these rights and flows. There is no policy-level effort to improve transparency in a way that reveals territorial and sectoral differences and their economic consequences. No other domain of economic policy operates in a darker twilight zone.

In this uninformed, unfocused, but expanding policy space, there are disparate results. The system appears to work well enough for frontier firms in pharmaceuticals, where patents still equate roughly to products. It appears to work poorly in software and Internet services,¹² where it is fraught with controversy. Recently, the push for patent reform in the U.S. and the closer look at injunctions and damages for standard-essential patents under FRAND commitments has exposed growing differences across ICT segments and value chain positions.

⁹ https://en.wikipedia.org/wiki/Report_on_Manufactures;

¹⁰ For a creative but partial assault on this problem, see Carol A. Robbins, [Measuring Payments for the Supply and Use of Intellectual Property](#), 2009.

¹¹ <http://www.businesskorea.co.kr/english/news/politics/11843-brain-drain-koreas-intellectual-property-right-trade-deficit-surges-record-high> (note that this is “intellectual property” licensing that does not break out patents)

¹² Federal Trade Commission, [To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy](#), ch 3, Business Testimony (distilling the views of four innovative sectors); for a rare effort to aggregate rents and costs by sector, see Bessen and Meurer, [Patent Failure](#), 2008. Both are discussed below.

Multilateral and global frameworks

Contrary to the Kappos article, the U.S. Constitution does not require that the U.S. government grant patents; it merely authorizes the granting of patents.¹³ By contrast, the TRIPS agreement (now part of the WTO charter) essentially imposes an overriding obligation to do so, and it specifically mandates that the patent term run at least 20 years from the date of filing -- for all “fields of technology,” albeit without defining “technology”. This one-size-fits-all mandate is immutable despite considerable agreement among scholars that under an economic calculus, the appropriate term should vary depending on factors such as scale of investment, risk, and time to market.¹⁴ However, TRIPS does not set maximum standards. Nor does it limit how patents are exploited, whether by private firms or by governments that choose to invest in or assert patents.

There has been virtually no progress on multilateral harmonization in the past two decades, in either WTO or WIPO. From the developed economy perspective, there was to be a one-way path to greater protection, an alignment that all would acknowledge and achieve in due course. This perspective is embodied in the Ginarte-Park index, in which 5.0 is a perfect score, approached only by the U.S. and a few other developed economies – in effect, a Washington Consensus for patents.¹⁵

Ginarte-Park instantiates a simplistic view of patent systems along a unidimensional “weak” to “strong” scale that continues to overhang the geoeconomics of patents. The index includes factors – availability of patents for software and availability of preliminary injunctive relief – that have proved especially problematic in the digital economy, however much they may please certain private interests. The U.S. and Europe have sought to increase standards that benefit IP incumbents through bilateral and regional trade agreements (“TRIPS plus”). Yet discussions on substantive harmonization have stalled in WIPO, and major economies have taken independent paths in expanding or reforming the scope and direction of patent systems under their jurisdiction.

In 1997, the Business and Industry Advisory Council to the OECD [expressed](#) its aspirations:

A common message from industry is the desire for legal certainty accompanied by a substantial reduction in costs, prompt patent

¹³ In Article I, Section 8, the Constitution specifies only that Congress has the power “To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”

¹⁴ See Benjamin N. Roin, [The Case for Tailoring Patent Awards Based on Time-to-Market](#), 61 UCLA L. Rev. 672 (2014)

¹⁵ The original 1997 index was [updated](#) by Park in 2008.

examination and continued efforts to ensure the highest levels of intellectual property protection and enforcement world-wide.

Demand for cheaper, faster, stronger patents persists after two decades of wrestling with overpatenting, poor quality, backlogs, and uncertainty -- problems largely occasioned by and centered in the ascendant digital economy.

Nevertheless, there have been significant but uncoordinated changes in the three largest markets – U.S., China, and Europe. On the whole, patents can be expected to be of most value in these markets because of the sheer size of the market they can or will protect, but the state of play in each of the three is unique. China’s subsidized, hyperactive patent system with its prodigious volume of utility models and design patents remains on meteoric trajectory. In 2015, SIPO granted 359,316 *invention patents* (equivalent to U.S. *utility patents* – and surpassing the U.S. number for the first time¹⁶), 876,217 utility models (no U.S. equivalent), and 482,659 design patents (compared to a record 25,986 U.S. design patents granted).

Europe’s long-term effort to integrate its territorially bound patent systems via a new *unitary patent* with a *unified patent court* is a characteristically European market integration project. This highly specialized system will take time to work out its procedures and institutional anomalies, including its need to be self-supporting, i.e., free of customary public support for courts and the judicial system.

The politics of patent reform in the U.S. reveals an almost unmanageable diversity of economic interests -- from “Main Street” users of information technology to multinationals with different business models. Reform has become a perpetual process, while controversies old and new, have grown in scope and intensity. These controversies divide industry along many dimensions: digital vs molecular industries; large vs small; upstream vs downstream; incumbents vs startups; operating companies vs patent specialists... There is even a conspicuous schism within the academic community as to the value of academic research.¹⁷

¹⁶ USPTO utility [patent grants totaled 298,407 in 2015](#), a slight decline from 2014 – and the first decline since 2007, at the time of Under Secretary Dudas’s quality initiative.

¹⁷ On March 2, 2015, 51 economics and legal scholars published [a letter](#) to Congress observing that empirical studies showed that “patent litigation now imposes substantial costs, particularly on small and innovative firms, and that these costs have tended overall to reduce R&D, venture capital investment, and firm startups.” Eight days later, 40 economists and law professors sent [a very different letter](#) that implicitly reads as a response to the first. The response is written in an aggressive, distinctly unacademic style as if generated by lobbyist, prompting speculation as to how it was generated. Abstracts for the articles in both bibliographies, [pro-reform](#) and [anti-reform](#), are posted on the Patent Progress website.

Global technical standards

Despite the territorial nature of patents, global technical standards are essential to developing new markets for digital technology. Standards build confidence in investment at all points in value chains by enabling interconnection, interoperability, and economies of scale and scope. In some areas where widespread implementation is desired (Internet, Web, software), standard-setting organizations discourage use of patented technology or at least require that participants license essential patents royalty-free.¹⁸ In areas where patents and royalties are expected (computers, cellular communications), participants must commit to licensing patents on fair, reasonable and non-discriminatory (FRAND) terms.¹⁹ Standards organizations have been reluctant to specify what these terms mean, but a few courts have started to address how a reasonable royalty should be calculated in the context of complex, function-rich products with possibly thousands of patents, trade secrets, and a hard-to-specify mix of unprotected functionality. In principle, this should include costs of evaluating, incorporating and integrating the technology that is already in the public domain.

At the same time, the explosion of patenting in digital technologies has brought fundamental changes to patent practice. The legal model of absolute exclusivity has given way to a practical framework of interdependence.²⁰ Accordingly, large patent portfolios are routinely cross-licensed on a global basis, but the terms are private. This interdependence parallels the stylized structure of international trade in which specialized inputs, products, and services are exchanged to mutual advantage. However, the structural interdependency of patent licensing is more complex because the blocking function of patents does not fit the cumulative assembly-line framework of value chains. This interdependency is far removed from public view -- despite the strong state interest in the proper functioning of the patent system. Among the largest firms, it is addressed on a portfolio level that obviates the need for transactional accounting at the patent level. This can be accomplished less formally through non-assertion agreements that further reduce the transactional burden. Indeed, the prospect of mutually assured destruction minimizes the need for any formal negotiation or transaction.

On the other hand, patents are also held by “non-practicing entities” that are not involved in production or even technology transfer – and so have no need to license in patents for their own use. Their presence naturally increases the potential for hold-up and territorial exclusion. In the U.S., the value that could be extracted by an inadvertently infringed patent was once much greater under the Federal Circuit’s rule of automatic injunctive relief – i.e., prior to the U.S. Supreme Court’s 2006 decision in *eBay v. MercExchange*. The leverage

¹⁸ These organizations include IETF, W3C, and OASIS.

¹⁹ RAND (FRAND without the “fair”) is used in the U.S., but the practical effect seems to be the same.

²⁰ Marshall Phelps and David Kline, *Burning the Ships: Intellectual Property and the Transformation of Microsoft*, 2009

provided by the old standard jump started the hold-up model by allowing patent owners (including a new breed of assertion specialists) to capture some of the sunk investments made by producing companies.²¹

The global patent community is reluctant to relinquish the paradigm of “strong” exclusivity, since doing so would lower the value of patents and portfolios. Opportunities for leveraged assertions spurred the development of aggregators and secondary markets, further increasing transactional volumes. These markets are distinguishable from true “markets for technology” in that the patents are transacted bare – i.e., without knowhow, trade secrets, personnel, or other complementary assets needed to produce complex products. According to intermediary accounts,²² value in these secondary markets is driven primarily by “evidence of use,” i.e., whether the patent is already infringed by a producing company (that quite likely developed the technology independently²³).

As the number of individual patents per product increases along with the scope of product-specific investments, the notional “strength” and “importance” of patents increases --- not because of any intrinsic value, but because of the increased leverage that an injunction can provide. When patent value is measured by evidence of use, it is further multiplied by additional infringing users. The often broad scope of software/business method patents (many implementations for relatively abstract functions) leads to increase in the number of potential infringers. In the case of industry standards, the expected use is universal, so an abundance of attractive targets is an inducement to speculation.²⁴

Excessive patenting in ICT inevitably leads to a cognitive overload that burdens entrepreneurs, engineers, designers, and lawyers. Defensive aggregator RPX has estimated that as many as 250,000 patents may be implicated in a smartphone.²⁵ How do firms, especially upstarts in developing economies, locate/identify patents on this scale? – and then evaluate them properly? Digital startups must look to patents in the markets they cannot do without – principally the U.S., China, and Europe – if they are to realize economies of scale in the face of global competition. Incomprehensible volumes of patents inevitably serve

²¹ The poster child for this problem was the \$612 million settlement that RIM [Blackberry] paid to NTP just before *eBay* was decided in 2006.

²² “[T]here has been increasing value in capturing patents that have demonstrated value, that is, there are issued claims that you can show actually are infringed by folks.” Ron Epstein, CEO of IPotential, FTC hearing, Berkeley, May 2009.

²³ Unlike copyright and trade secrets, patents do not require copying. On the rarity of allegations of copying in patent litigation, see Christopher Anthony Cotropia and Mark A. Lemley, [Copying in Patent Law](#), North Carolina Law Review, Vol. 87, p. 1421, 2009

²⁴ The large number of potential infringers was especially evident in the joinder of multiple defendants, especially in cases brought in the patent-friendly District of Eastern Texas. The practice of joinder in patent cases offered efficiencies for assertion specialists (trolls) but has now been restricted by the American Invents Act of 2011.

²⁵ [RPX S-1](#), filed Jan 21, 2011.

as thickets against new entrants who lack the resources to evaluate the thicket and assume the risks and consequences of inadvertent infringement.

With the well-known quality problem in digital patents, it may not make economic sense for anyone to investigate deeply. Costs can mount up quickly. First is the cost of searching for relevant patents. Once patents are identified, they must be evaluated. The retail cost of an attorney's opinion on validity averages more than \$13,000 per patent.²⁶ Then there is the cost of analyzing whether the proposed technology actually infringes the patent (another \$13-15,000).

This burden is avoided by ignoring patents,²⁷ a common practice justified in part by the liability for enhanced if willful infringement is found. But ignoring patents contradicts and undermines the disclosure principle that provides a primary justification for the patent right – and especially the rationale for keeping the patent application secret for 18 months.

Subsidies

For the entire office process from filing through examination, the USPTO expends an average of only \$3713.²⁸ This limited investment naturally contributes to the quality problem imposing future costs on the private sector, especially small firms. Yet even this small expenditure is subsidized. Instead of paying for the cost of the service, which is the general rule for fees for government services in the U.S., applicants pay at most \$1600, no matter how big they are. Small firms and micro-enterprises get the same service for \$800 and \$400 respectively (50% and 75% discounts) under statutory subsidies prescribed by Congress. At this low price, the successful applicant gets a patent with an enhanced presumption of validity that can only be overcome in court by “clear and convincing evidence.”

China also provides substantial subsidies, but rather than providing discounts for applications, direct subsidies for domestic applicants are provided from all levels of government – local, provincial, and national. The national government also provides direct subsidies for patent applications abroad (by Chinese inventors).²⁹ Such subsidies for domestic applicants are suspect under the WTO, but payments for applications granted can be characterized as awards for technological achievement (assuming an “applicant-friendly” standard).

Subsidies of one form or another are pervasive throughout the patent system. For example, the court system is heavily subsidized almost everywhere which means that the cost of hearing patent disputes once a suit is filed is born by the

²⁶ AIPLA Report of the Economic Survey 2013 on the cost of validity and infringement opinions.

²⁷ Mark A. Lemley, abstract for [Ignoring Patents](#) 2008

²⁸ See [Setting and Adjusting Patent Fees](#), final rule, Jan 18, 2013

²⁹ This practice was attacked by the National Association of Manufacturers (U.S.) attacked in a 2011 [submission](#) (p.11) to USTR's Special 301 consultation.

public.³⁰ Yet the transaction cost burden comes into sharp relief where the amount at stake is low – i.e., where small businesses are likely to litigate.

average costs of full litigation (AIPLA 2013)

amount in controversy	legal costs per side	x2 (total for both)	minimum legal costs relative to amount in controversy
>\$25M	\$5.9M	\$11.8M	n/a
\$10-25M	\$3.2M	\$6.3M	>25%
\$1-10M	\$2.1M	\$4.2	>42%
<\$1M	\$.968M	\$1.936	>194%

It is difficult to determine just how much will be expended in the course of a fully litigated dispute to search for and evaluate prior art, it will certainly far exceed the average \$13K for a routine validity opinion with no guarantees. In principle, potential costs are compounded when production is through global supply chains (as it often is for complex products like IT), since each country that components pass through is a potential chokepoint for asserting domestic patents. The largest markets offer the most attractive targets because that’s where “reasonable royalties” should be highest.

The possibility of patent exclusion in the market of a small country may be inconsequential, but exclusion from a market the size of China or the U.S. (or Europe as it will be under the new unified patent court) would be catastrophic. The U.S. is extraordinarily well-equipped to exclude imports when infringement of U.S. patents can be demonstrated – thanks to the unique remedy of exclusion orders provided by the International Trade Commission (ITC). While the ITC cannot assess damages, its exclusion orders are nearly automatic – unlike injunctive relief after *eBay v. MercExchange*. Earlier ITC legislation was found to contravene the GATT, and the revised charter has not been tested under the WTO. Given China’s position in value chains as an assembler of components,

³⁰ The Congressional Budget Office (CBO), which is charged with scoring the economic burden of proposed legislation, does not take the cost of judicial resources into account. This is remarkable since the parties’ costs of litigation are a major factor determining private behavior.

Chinese patents may enjoy additional value if an injunction halts all further distribution of component or package.³¹

FRAND commitments

A structurally similar problem arises for FRAND-encumbered standard essential patents. But FRAND commitments are contractual and global, applicable everywhere, while judicial interpretations of what “reasonable” means and when injunctions may be appropriate may vary from jurisdiction to jurisdiction.³² Until recently, standards organizations have left these terms undefined, but the new IEEE policy (cleared with the U.S. Department of Justice and adopted in 2015) states that FRAND is to be calculated for the smallest marketed unit and specifies limitations on when injunctive relief can be granted.³³ Debate over the new IEEE rules has pitted some royalty-dependent companies -- Ericsson, Nokia, Interdigital, and Qualcomm -- against the rest of the industry.

Patent law is normally indifferent to how patents are used in practice. It views patents as absolute property rights that owners are free to exercise as they wish.³⁴ Patent offices regulate the application and examination process; beyond that, patent-related behavior is left to competition policy and private ordering. Historically, standards-setting organizations have been reluctant to impose requirements beyond limited disclosure based on the personal knowledge of the participant and a commitment to licensing under FRAND terms.³⁵ This has left implementation of the FRAND commitment to be worked out between individual companies.

Bilateral negotiations over standard-essential patents worked reasonably well because many of the larger companies were already cross-licensed with each other. However, disputes flared around the smartphone, which brought different technologies together in one product. A few recent high-profile cases have sought to clarify the meaning FRAND commitment and the use of injunctive relief – thereby provoking public discussion. A dispute between Motorola and Microsoft was especially important because the judge provided a detailed analysis of apportionment that embraced the smallest saleable unit as the starting point for calculating royalties, with damages ending up far smaller than what Motorola had asked for. Then, separately, a Seattle jury found Motorola liable to Microsoft for securing an injunction in Germany against Microsoft on

³¹ See footnote ___ re the BYD dispute with Apple below.

³² Reasonable could be defined under the contract or interpreted according to the national law of a designated country (France in the case of ETSI).

³³ Jorge L. Contreras, [IEEE Amends its Patent \(FRAND\) Policy](#), Patently-O, Feb 9, 2015

³⁴ The claims in patents are said to be equivalent to the metes and bounds that demark real property boundaries. But unlike real property, which is precisely surveyed and visibly delineated, with two sides to every boundary, patents are defined by words and boundaries that may be overlapping and “fuzzy,” especially in software and business method patents.

³⁵ One notable exception is [VITA](#), which has strict disclosure requirements and a requirement that contributors of patented technology specify the maximum royalty in advance.

FRAND-encumbered SEPs, which caused Microsoft to move its European distribution center from Germany to Ireland.

Patent mercantilism?

Qualcomm and others have expressed concern that the positions taken by the FTC and DOJ will encourage aggressive behavior by foreign competition agencies -- notably China, India, Japan, and South Korea. Indeed, China's National Development and Reform Commission (NDRC) recently fined Qualcomm \$975 million for excessive licensing fees for standard-essential patents.³⁶ Another less-noticed part of the order struck down Qualcomm's requirement that its licensees refrain from suing each other for patent infringement.³⁷ Thus, the decision benefits China's patent-rich giants (Lenovo, ZTE, and Huawei), who will not only enjoy lower license fees from Qualcomm but are free to assert their massive portfolios against new entrants no longer shielded by Qualcomm's license.

In contrast to patents, there is no treaty or other formal international harmonization of competition law. The International Competition Network (ICN) is only an information-sharing group, and China is not a member. Unlike the U.S. Federal Trade Commission, neither the ICN, the OECD Competition Policy Committee, DG Competition, nor any other national competition agency has examined how patents work in the digital economy. Yet unlike patent law, antitrust laws reach extraterritorial activities when there is an effect on the domestic market, as there often is with larger mergers and acquisitions.

Indeed, a closer look at the NDRC's decision on Qualcomm reveals other differences between the NDRC's approach and developments on interpreting FRAND elsewhere.³⁸ It is fair to say that NDRC takes a more top-down regulatory approach, whereas U.S. and European agencies defer to private ordering, subject to judicial resolution where disputes cannot be privately resolved. Whereas NDRC sets benchmarks for royalties on a whole product basis and focuses on the licensor, the US/European agencies and courts drill down into economic apportionment and, less easily, difficult-to-validate "market" rates.³⁹

³⁶ Jack Ellis, [Qualcomm antitrust decision could be the Big Bang moment for China's domestic patent market](#), IAM Blog, Jan 12, 2015

³⁷ The standard contract for Amazon Web Services (AWS) purports to create an environment free from patent litigation; see [Beware the IP non-assert clause in AWS cloud service agreement, warns ex-Microsoft patent chief](#), IAM Blog, July 12, 2015.

³⁸ James F. Brelsford and William J. Casey, [The fracturing of global FRAND patent licensing](#), Lexology, June 23, 2015

³⁹ The quotations around "market" reflects the fact that these are *dark* markets in which information is sparse, suppressed, contextual, selectively revealed, placed under seal, and/or redacted.

China's giants, state-owned or otherwise, may benefit from a close relationship with the Chinese government. But does this differ from the close relationship between the US government (especially USTR and PTO) and large U.S. patent holders – especially at an international level where influence is hidden behind secretive negotiations over trade agreements? WIPO is more transparent. After the Federal Circuit's *State Street* decision legitimized non-technological business method patents in 1998, the U.S. took an aggressive position on patentable subject matter in WIPO negotiations. Had it succeeded, would have advantaged U.S. firms that had invested in such patents. Today, in the wake of the Supreme Court's decision in *Alice v. CLS Bank*, the argument is heard that Congress should act to expand the scope of patentable subject matter because the U.S. is preeminent in software.

The specter of “patent mercantilism” (emphasizing competitiveness over innovation) is more familiar in the case of the pharmaceutical industry. It was the pharmaceutical sector which championed the “technology-neutral” aspect of the TRIPS agreement. While patent professionals generally have been delighted with the expanded prospects for patents, opposition to expansion into non-technological subject matter such as business methods arose from IBM (otherwise an ardent proponent of software patents) as well as firms within the financial sector.⁴⁰ In 2002, the US demanded that WIPO members endorse the patentability of business methods, threatening to walk out if others did not acquiesce in this “best practice.”⁴¹ Had other countries gone along, they would have found themselves well behind the game in terms of patents and applications – and far down the learning curve.

Opacity and ignorance

Since then, no progress has been made on substantive harmonization in WIPO – nor in WTO for that matter. The troll phenomenon has darkened the reputation of the U.S. patent system. The tactical and strategic implications of patent portfolios are better understood than when TRIPS was negotiated, but they remain unvoiced at a policy level.⁴²

⁴⁰ In the America Invents Act of 1999, Congress shied from restoring the longstanding judicial exclusion of methods of doing business. An awkward compromise provided prior user rights for the first time in U.S. law but only for methods of doing business. This arguably endorsed the Federal Circuit's *State Street* decision allowing patents on business methods while apparently contradicting the nondiscrimination clause of TRIPs – unless of course business methods are not a technology.

⁴¹ Report of the 7th Session of the WIPO Standing Committee on the Law of Patents, Geneva, 6-10 May 2002, adopted 25 November 2002 as [Document SCP/7/8](#); see paragraphs 159-173, especially the exchange between the European and U.S. delegations at 170-171.

⁴² A rare exception was the public criticism of the pending European software patent directive by a group of innovation economists, who argued that the directive would favor portfolio owners over small software developers. See Laura Rohde, [EU software patent plan draws fire](#), Infoworld, August 28, 2003. The European Parliament voted against the directive in 2005.

There has been little appetite for policy interventions in patent markets, just as there was little interest in intervening in the market for innovative financial instruments. Yet the policy-level ignorance of patent markets is more remarkable because patent markets are the product of government-defined and awarded rights. Beyond the often heavily restricted record in court cases, there is virtually no public data on how patents are used in business. Corporate reporting is largely voluntary and therefore minimal. Assertions in the form of notice letters are 10-25 times the volume of lawsuits filed,⁴³ but such assertions are not reported. Patent markets remain largely undocumented, leaving ample room for speculation and forcing researchers to rely on costly surveys and controversial methodologies. Accurate information on the scale of assertions in different countries, industries, and business contexts would be of great help in understanding the full economic effects of patents. Yet for a variety of business and legal reasons, we are unlikely to get it. The markets will remain dark.

This state of affairs makes it difficult to criticize China and other countries for the opacity of patent practice under their jurisdiction. In fact, one rationale for sovereign or state-supported patent funds is that direct or indirect involvement in aggregating and using portfolios may be the only practical way for governments to learn about patent practice and patent markets. In the U.S., the FTC makes occasional efforts to convene panels of economists, legal scholars, and practitioners. But the last FTC report was based on input from 2008-9, a long time ago by digital standards.⁴⁴ There has been no general survey of business use since 1994 (“Carnegie-Mellon”), and that survey did not address software. The more detailed Berkeley survey of startups was conducted nearly nine years ago.

The Census/NSF Business R&D and Innovation Survey ([BRDIS](#)) illustrates the problem with respect to official statistics. BRDIS addresses patents (and other legal categories of intellectual property) with a context-free three-point Likert scale that simply asks whether patents are unimportant, important, or very important to the business.⁴⁵ It does not specify whether the question is to be answered by patent lawyers or R&D managers. Nor does it ask why patents are important: Because there are so many of them? Because they are used defensively to support freedom to operate? Because they are so powerful? Because portfolios present a barrier to new entrants? Or because they can be readily monetized?

⁴³ Richard Lutton, Apple Computer, testified that Apple received 25 letters claiming infringement for every lawsuit actually filed at a hearing before the House Subcommittee on Courts, the Internet, and Intellectual Property, April 20, 2005.

⁴⁴ The 2008-9 hearings led to the 2011 report [The Evolving IP Marketplace: Aligning Patent Notice and Remedies With Competition](#). A study on patent assertion entities launched in 2014 is pending.

⁴⁵ The responses on copyright and other regimes also give reason to be leery about the survey results. For example, 39% of publisher respondents reported that copyright. John E. Jankowski, [Business Use of Intellectual Property Protection Documented in NSF Survey](#)

There is irony here not only in the routine involvement of the state in defining, examining, issuing, and enforcing patents – but also in the etymology of “patent” as a laying open, and the failure of the disclosure function noted frequently by academic researchers in recent years. Clearly, there is wide variation here. At the pharmaceutical end of the spectrum, the regulatory environment, precise molecular claims, and high economic value of successful drugs makes reading patents informative and critical to understanding the technological and business frontier. At the digital end of the spectrum, dubious quality, abstract claims, and uncertain economic value work against reading patents, along with advice of counsel that reading patents may expose the firm to treble damages for willful infringement. Lisa Ouellette’s 2011 survey of nanotechnologists makes the case that for this one tangible technology, some technologists do read patents, but it also shows that the disclosure and teaching functions are working poorly.⁴⁶

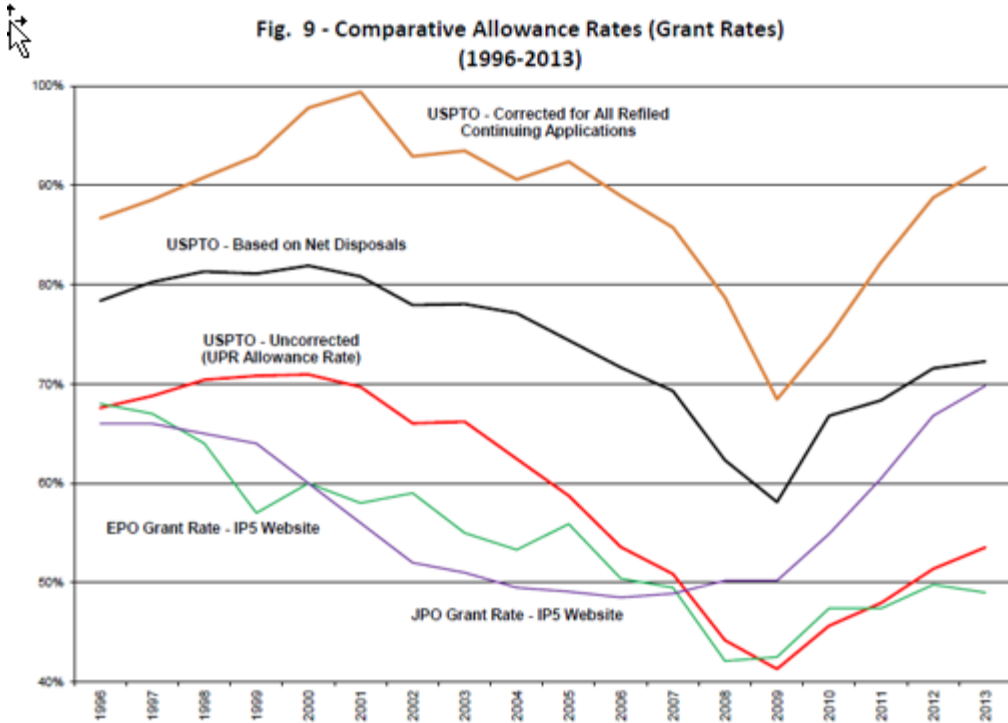
Quality

A major problem with the front-end subsidy of application and examination fees is that it provides the patent office with a strong incentive to grant patents. Only if applications are granted will issuance and maintenance fees be paid, and these fees are needed to make up for the initial subsidy. Frakes and Wasserman find that budgetary concerns affect the allowance rate.⁴⁷ The political sensitivity of the allowance rate is shown by a dramatic reversal between the later Bush years under Jon Dudas and the initial Obama years under David Kappos. After Dudas attempted to reverse permissive standards to the consternation of the patent bar, the effective allowance rate shot up dramatically under Kappos⁴⁸:

⁴⁶ Ouellette reviews the academic writing on the failure of the disclosure function. Lisa Larrimore Ouellette, [Do Patents Disclose Useful Information?](#), Harvard Journal of Law & Technology, Volume 25, Number 2 Spring 2012

⁴⁷ Michael Frakes and Melissa F. Wasserman, [Does Agency Funding Affect Decisionmaking?: An Empirical Assessment of the PTO’s Granting Patterns](#), Vanderbilt Law Review, Vol. 66, 2013

⁴⁸ As reported in the [ABA Journal](#), when Kappos arrived as Under Secretary, he sent an e-mail to all examiners addressing the culture of rejection in which a lower allowance rate became the measure of higher quality. “Let’s be clear: Patent quality does not equal rejection.” While true in a limited sense, it is hard to conceive of a more objective measure. For a critique of the quality measures developed by the Office of Chief Economist under Kappos, see Brian Kahin, [Software Patents: Separating Rhetoric from Facts](#), Science Progress, May 15, 2013



Cotropia, Quillen, and Webster 2013

Presumably, this made life much easier for patent examiners. The USPTO catapulted from 107th to 1st place over the same period in the annual ranking of [best places to work in the federal government](#). Since then, the USPTO has been severely criticized by Commerce Department's inspector general for lax oversight of telecommuting and extremely generous performance reviews.⁴⁹

As the chart on the allowance rate shows,⁵⁰ the effective allowance rate is considerably higher in the U.S. than in Europe and Japan. This is consistent with the annual IAM survey, which show the USPTO significantly below the EPO and JPO in terms of perceived quality.⁵¹ Concerns have been raised about the volume and quality of Chinese patents, and China has also institutionalized low quality in the form of legions of utility model patents. While utility models are not unique to China (47 countries grant them in some form), China granted over 700,000 utility model patents in 2014 over 46 times the number awarded in third-ranked Germany.

⁴⁹ See Lisa Rein, [Patent office filters out worst telework abuses in report to its watchdog](#), Washington Post, August 10, 2014; Lisa Rein, [Patent and Trademark Office doesn't know if examiners are doing their jobs, watchdog says](#), Washington Post, April 14, 2015.

⁵⁰ 2013 figures are updated from Christopher Cotropia, Cecil Quillen, and Ogden Webster, [Patent Applications and the Performance of the U.S. Patent and Trademark Office](#), Federal Circuit Bar Journal, Vol. 23, 2013. The data also suggest corresponding trends at the EPO and JPO (perhaps taking policy cues from the U.S.), although the shift is most dramatic at the USPTO.

⁵¹ Sara-Jayne Clover, [Despite a year of conflict, the EPO is still rated as number one for quality and service by IAM readers](#), May 26, 2016

China also has roughly twice the volume of patent litigation as the U.S., although this appears to be mostly small-stakes litigation among Chinese individuals and small firms. China granted 15 times as many design patents as the U.S. did in 2014. Yet the Federal Circuit recently validated disproportionate design patent damages (the defendant's entire profits) based on a 19th Century statute, refusing to follow an apportioning case because smartphone cases were not sold separately!⁵² There is widespread concern that this will open up new territory for trolls. It sets a bad example internationally, insofar as it rationalizes departures from current economic realities – and benefits a domestic champion against its principal foreign competition.

Despite the lower EPO allowance rate and favorable survey results, concerns are also raised about EPO-issued patents. Worried about the dangers of preliminary injunctive relief (under the pending Unified Patent Court) in the light of questionable patent quality, Nokia commented:

In the last 5 years, Nokia has defended against over 150 patents in Europe. Many were dropped at an early stage. 71 were pursued to judgment. Of those 71, the courts have determined that only one was valid - and even that was later revoked by the EPO.⁵³

While this kind of data is subject to varying interpretations, it does not inspire confidence in the evenhandedness, precision, or predictability of the patent system.

In the popular mind, patents are associated with major breakthroughs, such as the telephone and the incandescent lightbulb. However, in the U.S. patents are awarded as a legal entitlement that is not related to economic or technological value. An application must be granted, unless the examiner can affirmatively show why it should not be granted (operating under time constraints – an average of 18 hours for processing and examination⁵⁴). The operating philosophy was described by Judge Giles Rich, the former dean of Federal Circuit jurisprudence and principal draftsman of the 1952 Patent Act:

[Patents] are not for exceptional inventors but for average inventors and should not be made hard to get.... Why must an invention be a commercially hot number to be patentable? If it is a total dud, how is the public injured by a patent

⁵² Apple Inc. v. Samsung Elecs. Co., 786 F.3d 983 (Fed. Cir. 2015). The Supreme Court has just agreed to review the case. Although Samsung may not have separately sold the case to the smartphone in question, Apple now sells enhanced cases for its phones: <http://www.ndtv.com/world-news/apple-promises-its-new-smartphone-case-will-give-you-25-hours-of-talk-time-1252718>. There are also many independent sources of smartphone cases, as a quick search on eBay will reveal.

⁵³ Tim Frain (Nokia), [Patent reform - innovation, enforcement and the future of the single European patent](#), Westminster Legal Policy Forum, 2013

⁵⁴ Actual search time may be less than two hours, with around 13 hours for the examination process. Bruno Van Pottelsberghe, *Industrial and Corporate Change*, Volume 20, Number 6, footnote 9.

on it? A monopoly on something nobody wants is pretty much of a nullity. That is one of the beauties of the patent system. The reward is measured automatically by the popularity of the contribution.⁵⁵

This surprisingly permissive view may not be problematic where there is a close correspondence between patents and products and independent invention is unlikely, but if the patented function is one among tens of thousands, there is great potential for leveraging trivial patents against investments in whole products. The problem is magnified in a global economy with millions of innovators working primarily from tacit knowledge without reading patents or other forms of documentation. (The documentation that they are most likely to read are standards documents that specify how different components interact.)

Uncertainty

Like the financial system, patenting has expanded through extensions that are speculative, transaction-driven, and more remote from the real economy. In the extended digital environment, many factors contribute to the uncertainty of patent value: the vast amount of prior art; the ambiguous language of patent claims (“fuzzy boundaries”); the difficulty of applying the inventive step (nonobviousness) standard; and the many paths to performing the same function. Unlike innovative financial instruments, patents are a creation of the state, and because patent administration is transaction-based there are incentives for patent agencies to expand the volume and scope of patenting. When patents are invalidated in court, patent offices do not ordinarily investigate what went wrong. There is no monitoring of how issued patents fare in practice. Mistakes are born in the future by unknown firms in the private sector, not by the patent office or its employees. The adverse consequences of low-quality and wrongly issued patents take years to materialize.⁵⁶ With a rapid turnover of examiners in the U.S. (average tenure is three years), it may be easy to think in the same terms that characterized volume-driven intermediaries in the financial sector: “I’ll be gone; you’ll be gone.”

Like developments in U.S. law, the long-term systemic effects of China’s hypertrophic patent system will take years to play out. Rising patent numbers increase the role of portfolios, markets, and thickets, and these aggregated territorial rights may impact global value chains and trade. On the other hand, the sheer size of the Chinese and U.S. product markets makes them irresistible

⁵⁵ Giles S. Rich, *The Principles of Patentability*, 28 Geo. Wash. L. Rev. 393, 407 and Journal of Patent Office Society, Vol 42, No 2, p 85 (1960).

⁵⁶ Michael Risch ([Patent Troll Myths](#), 2011) reports that non-practicing entities file suit an average of 8.3 years after the patent issues, raising the “submarine patent” concern that opportunistic patent holders deliberately wait until products, businesses, or industries develop around patented technologies. This strategy is not limited to classic trolls; see Joe Mullin, [IBM sues Groupon over 1990s patents related to Prodigy](#), Ars Technica, Mar 3, 2016. At a trade policy level, this means that the handicap for emerging economies may effectively be measured in decades rather than years.

to outsiders, especially for industries characterized by extreme economies of scale.

Could China and the U.S. be characterized as having national-scale patent thickets? Carl Shapiro's classic definition of a patent thicket reads: "a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology."⁵⁷ But among large firms, cross-licensing and non-assertion agreements have generally worked to avoid bloodshed. Less formally, conflict may be averted through the prospect of mutually assured destruction – or inhibited by the cost (direct and reputational) of litigating given the diluted economic value of most patents in complex products and the risk that accusations of infringement may fail or trigger counterassertions. Some large, sophisticated companies with long memories may do relatively well at navigating this environment. Small firms must take their chances or confine themselves to niche technologies where they can be sold to large firms that benefit from scale economies and complementary assets.

Unlike individual patents, portfolios can be continually “evergreened” with a stream of new applications on adjacent or complementary technology.⁵⁸ The portfolio, rather than the patent, is de facto the fundamental unit,⁵⁹ so that the head start is not the 20-year term set for individual patents, but an indeterminate period, offering roughly a 20-year lead time. This lead time might be publicly justified as an entitlement based on continuing investments in R&D, but this is a policy argument based on scale of investment rather than a legal argument for individual patents. It plays poorly at an international level if used to rationalize self-perpetuating lead times for developed economies based on aggregated past investments.

Research indicating bias in the examination process⁶⁰ further suggests that national thickets will further disadvantage outsiders – on top of the costs of translation and the difficulties of navigating patents and prior art in a foreign language. Spain has declined to join Europe's pending Unified Patent Court because of the language issue.⁶¹

⁵⁷ Shapiro, Carl, [Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard-Setting](#) (March 2001)

⁵⁸ This differs from “evergreening” as practiced in pharmaceuticals, which refers to supplementary patenting that, along with the trademark, help extend the market position of an expiring core patent. See Ove Granstrand and Frank Tietze, [IP strategies and policies for and against evergreening](#), University of Cambridge Centre for Technology Management Working Paper, April 2015. ICT portfolio evergreening differs structurally because it is based on an indeterminate mix of scale and scope, which makes it difficult to model or assess.

⁵⁹ Gideon Parchomovsky & R. P. Wagner, [Patent Portfolios](#), 154 U. Pa. L. Rev. 1 (2005).

⁶⁰ Webster, E., Jensen, P. H. and Palangkaraya, A. (2014), [Patent examination outcomes and the national treatment principle](#). The RAND Journal of Economics, 45: 449–469. doi: 10.1111/1756-2171.12053

⁶¹ See [‘Spain would have been better off inside the Unitary Patent and the Unified Patent Court’](#), Kluwer Patent Blog, October 20, 2015. Italy, with similar concerns, joined up only after Spain lost its legal challenge to the UPC in the Court of Justice of the European Union.

Risks are compounded by subjective factors that transcend ordinary economic damages, especially for outsiders. In the U.S., “willful” infringement can result in up to treble economic damages as a form of punishment. Another is the crafting of remedies to include “deterrence,” following the argument that otherwise firms would infringe first and pay only after a judgment.⁶² To be sure, uncertainty can be reduced – and is ordinarily reduced in the course of litigation as more information is revealed. But reducing uncertainty through litigation is costly and favors large over small, incumbents over startups, local interests over remote interests. While accusations of bias are often levelled at China, the U.S. system has built-in institutional biases: jury trials,⁶³ forum shopping by plaintiffs,⁶⁴ the International Trade Commission, and the ability of the White House to override ITC decisions on “policy” grounds.⁶⁵ All of these were conspicuously on display in the Apple v. Samsung litigation. Viewing these aspects of U.S. practice from abroad, it is easy to imagine that the Federal Circuit’s blatantly punitive decision awarding Apple disproportionate damages for design patent infringement is simply another episode of local favoritism.⁶⁶

Asymmetries and Distortions

Because the value of patents is directly related to the size of the market for which the patents are issued, the U.S. has been the world’s “reserve” patent system. While the European market is of similar size, the European patent system has been fragmented by law, administration, and language. Europe’s pending unitary patent and Unified Patent Court are designed to provide a new option to make European patents more valuable and more important on the geo-economic stage. But the new system (which will be superimposed as a third alternative on top of the old national and EPO systems) will take time to implement. The idea is that there will be more patents because the costs of securing and enforcing patents for all of Europe will drop, putting Europe on par with China and the U.S. However, the Unified Patent Court free-standing and must cover its own costs (unlike national courts), which may impose significant barriers to SME participation.⁶⁷

⁶² Of course, this is only the case if the cost litigation is trivial. As the AIPLA survey shows, it is not trivial except perhaps in relative terms for the very largest firms.

⁶³ Kimberly A. Moore, [Xenophobia in American Courts](#), Northwestern University Law Review, Vol. 97, p. 1497, 2003

⁶⁴ Forum shopping entails both the ability to choose pro-plaintiff venues such as the notorious Eastern District of Texas (favored by trolls) and the ability to litigate before a hometown audience, as Apple was able to do against Samsung.

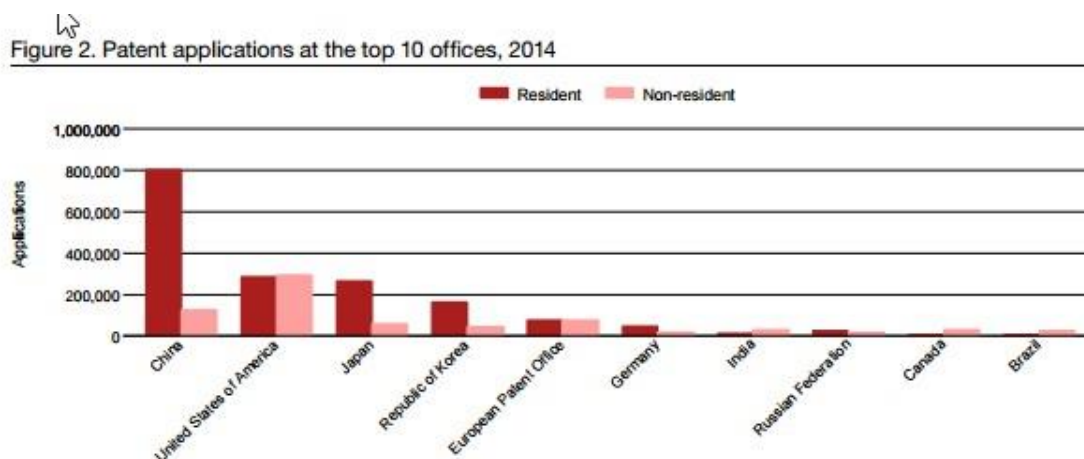
⁶⁵ See Brian Kahin, [Patently Geopolitical](#), IP Watch, August 26, 2013

⁶⁶ The Federal Circuit interpreted a 19th Century statute to require Samsung to pay all profits earned for the product. The U.S. Supreme Court has recently granted certiorari in this case, an indication that the Federal Circuit’s [decision](#) may be overturned.

⁶⁷ See [position paper](#) of the European Digital SME Alliance.

China’s emergence as an economy on par with the U.S. puts China’s patent system in the spotlight. China’s consumption of smartphones and other complex goods is growing rapidly, with China strategically positioned in the assembly stage of many value chains.⁶⁸ China’s policy-inflated patent system is by far the largest in the world in terms of applications (for “invention patents”) as well as issuance of utility model and design patents.

It is not just a matter of technology strength and market size. The extreme skew in applications is dramatically revealed by WIPO statistics for the top ten countries:



Note that the U.S. is the top destination for foreign applicants, now followed by China. This reflects the importance of these top two markets, but there are other contributing factors, including the availability of injunctive relief, the customary amount of awarded damages, generous allowance rates, the scope of patentable subject matter, and other subsidies and incentives. Tradition and political context also play a role, especially in domestic to foreign imbalances. For example, Japan has a long tradition of many narrow patents (which were once legally limited to a single claim).

Clearly the 250,000 patents that RPX is concerned with are not showing up in most of the world’s patent offices. The skew in patents suggests that the cost of securing patents is a limiting factor but that coverage in the most important markets may suffice as a practical matter.⁶⁹ This means that the technology is in the public domain in all other countries, and, at least in principle, the disclosure

⁶⁸ Apple’s [recent dispute](#) (since resolved) with its own supplier BYD may be a harbinger of supply chain problems to come. It should be noted that while the value capture of assembly has been shown by Kraemer et al to be very low, because patents are a negative right to exclude, the hold-up value is potentially high.

⁶⁹ The relative effectiveness of coverage in a few top markets has been an argument made by some against the unified patent/Unified Patent Court in Europe, but this argument succeeded because it was presented as yet another option. Yet it is an option only for asserting patents, not for defending against patent claims – another case of “applicant-friendly” imbalance.

required of patents where they exist should make the knowledge needed for implementation widely accessible. As long as the technology is not for export to the largest markets (where patents are in force), one might expect jurisdictions that are relatively patent-free to develop alternative models of commercialization.

Diversity in Technology

Article 27.1 prohibits WTO members from discriminating with respect to patent protection on the basis of technology, but discrimination does not equal differentiation.⁷⁰ The one case to interpret this statement, [Canada – Pharmaceuticals](#), let stand provisions for experimental use of pharmaceuticals similar to the Hatch-Waxman Act in the US, but not the provisions for pre-expiration production and stockpiling.

The [FTC/DOJ hearings \(2002\)](#) revealed stark differences in how four innovative sectors perceived the U.S. patent system, ranging from deep discontent in the case of software and Internet services to general satisfaction in the case of pharmaceuticals.⁷¹ Using a pioneering cost-benefit analysis based in part on event studies (market response to patent litigation), economists James Bessen and Michael Meurer found that pharmaceuticals and chemicals benefited from the patent system while software and financial services experience it as a net tax on innovation (*Patent Failure*, 2008). Patent scholars Dan Burk and Mark Lemley published an entire book, *The Patent Crisis and What the Courts Can Do About It* (2009), on the problem of technological diversity in patent law. Despite the inviting subtitle and the credentials of the authors, the Court of Appeals for the Federal Circuit has completely ignored their analysis – indicative of the distance between judicial and academic thinking on patent policy.

In the meantime, differences in perspective and practice have been abundantly reflected in the U.S. debate over patent reform. Given the differences among technologies, it should not be surprising that a unitary legal system leads to economic distortions. In adhering to a system optimized for marketed molecules, digital technology in effect subsidizes the pharmaceutical industries.

However, there is a practical market need to develop global standards for digital technology – especially in products, systems, and networks where different components/products are expected to interoperate. Combined with a recurring need to develop markets for new products, this has led to a prominent role for standards institutions that can operate efficiently on a global basis. There has been a profound shift from officially sanctioned national bodies feeding into

⁷⁰ Rochelle Dreyfuss and Graeme Dinwoodie, [Diversifying without Discriminating: Complying with the Mandates of the TRIPS Agreement](#), Michigan Telecommunications and Technology Law Review, Vol 13 No 2, 2007

⁷¹ Federal Trade Commission, [To Promote Innovation: The Proper Balance of Competition and Patent Law and Policy](#), Oct 2003

international organizations to industry-led consortia that are able to create globally accepted standards in relatively short order.

These relatively open consortia have avoided practices that have drawn antitrust scrutiny in the past. By requiring that participants commit to licensing standard-essential patents (SEPs) on fair, reasonable, and nondiscriminatory (FRAND) terms, they have created a contract-based environment in which competition agencies feel more comfortable operation and in which judges can rethink what reasonable royalties should be. However, the stakes are very high, since the global nature of the standard means that the entire industry – producers, distributors, and users – can be expected to pay royalties. The large number of patents and the many patent holders creates potential for “royalty-stacking” – that is, cumulative royalties that are disproportionate to the value of the product. There is considerable disagreement about how significant the “royalty-stacking” problem is. Licenses are confidential, and royalty-stacking is a matter of degree. There is no consensus on how much of the value of a complex product should be attributed to the value of individual patents, especially those essential to a standard.⁷² Nonetheless, recent litigation has made some progress in apportioning damages for infringement to reflect relative economic value.⁷³

Uncertainty as a weapon

As noted, value in secondary markets is based primarily on evidence of use, i.e., arbitrage value based on information failure. But patent applications are not published until 18 months after filing, and few companies can monitor the firehose of applications in digital technology. Since boundaries of digital patents are often unclear and prior art may be difficult to find,⁷⁴ opportunities for assertion are not readily apparent. Assertion is often delayed until the patent falls into the “right” (or “wrong”) hands. (Patent assertion entities do not file suit until an average of 8.3 years after the patent issues.⁷⁵)

Uncertainty is endemic to innovation, but here technological and market uncertainty is compounded by legal uncertainty. Ironically, this multidimensional uncertainty is generated by an intellectual property regime that is intended to

⁷² See Jorge Contreras and Richard Gilbert, A Unified Framework for RAND and Other Reasonable Royalties (January 1, 2015). Berkeley Technology Law Journal, Forthcoming; University of Utah College of Law Research Paper No. 91. Available at SSRN: <http://ssrn.com/abstract=2502066>

⁷³ Jorge Contreras, [SO THAT'S WHAT "RAND" MEANS?: A Brief Report on the Findings of Fact and Conclusions of Law in Microsoft v. Motorola](#), Patently-O Blog, April 27, 2013; Joe Mullin, [Wi-Fi "patent troll" will only get 3.2 cents per router from Cisco](#), Ars Technica, Feb 6, 2014 (Memorandum and Order [here](#)); Jason Rantanen, [Ericsson v D-Link: Standards, Patents, and Damages](#), Patently-O Blog, Dec 4, 2014.

⁷⁴ Both problems are related to the degree of abstraction. The Supreme Courts has made it clear that abstract ideas are not eligible for patents, but abstraction is relative and hard to define. [Alice v. CLS Bank](#) (2014) is the most recent formulation.

⁷⁵ Michael Risch, [Patent Troll Myths](#), Seton Hall Law Review, Vol. 42, p. 457, 2012

minimize risks associated with investments in innovation and to promote public knowledge. And uncertainty can be used as a weapon – for example, to extract settlements from smaller players who simply cannot afford to contest a claim of patent infringement.

The most notorious example, MPHJ Technology Investments, sent letters to thousands of small businesses intimating that they were infringing a “scan-to-email” patent and offering a license at \$1,000 per worker. This kind of behavior does not attract academic interest, but it has attracted public attention it has led at least 18 states to pass legislation against bad faith patent assertions at a time when federal legislation has stalled.⁷⁶

Large companies with successful products at stake are also vulnerable – not just from trolls, but from larger, more established firms. Published accounts are rare because settlement agreements typically preclude the parties from talking, but Silicon Valley attorney Gary Reback vividly recounts an IBM lawyer’s threats against Sun (not a small company but a latecomer relative to IBM):

“OK,” he said, “maybe you don’t infringe these seven patents. But we have 10,000 U.S. patents. Do you really want us to go back to Armonk [IBM headquarters in New York] and find seven patents you do infringe? Or do you want to make this easy and just pay us \$20 million?”⁷⁷

An elaborate account of “[patent bullying](#)” in litigation is provided by Ted Sichelman’s detailed account of Verizon’s attack on Vonage, an innovative voice-over-IP service.⁷⁸

First-mover advantages and mission creep

The amassing of thousands of patents with 20-year terms is in effect a form of regulatory incumbency. This is of special concern when sophisticated incumbents are able to take advantage of shifts in philosophy and regulatory practice in advance of others, thereby securing what appear to be patents on fundamental ideas ahead of the market. For example, IBM was able to gain leverage over the emerging software industry in 1980s and 1990s by developing a software patent portfolio well in advance of others (despite the fact that it had

⁷⁶ See Paul R. Gugliuzza, [Testimony Before the House Committee on Energy and Commerce, Hearing on Patent Demand Letter Practices and Solutions](#), February 26, 2015

⁷⁷ Gary Reback, [Patently Absurd](#), Forbes, June 24, 2002. Reback is known for his work on behalf of Netscape in motivating the U.S. Department of Justice case against Microsoft.

⁷⁸ See also Robin Feldman’s account of Microsoft’s patent attack on Barnes and Noble, in which Microsoft demanded that Barnes and Noble sign non-disclosure agreements to be informed of the specific patent claims that it was asserting. Robin Cooper Feldman, [Intellectual Property Wrongs](#), 18 Stanford Journal of Law, Business & Finance 250 (2013). Barnes and Noble defended itself with extraordinary vigor, hiring David Boies, whom the Justice Department had hired to litigate against Microsoft in the epic antitrust trial, and filing a formal complaint with the Justice Department concerning Microsoft’s unwillingness to specify its infringement without securing a nondisclosure agreement.

opposed patents for software in 1960s and 70s), aware that the PTO had relaxed its opposition toward software patents.⁷⁹ The 20-year patent term helps first movers leverage this kind of advantage. IBM's recent suit against Groupon, asserting patents for software technology dating to the 1980s, illustrates how incumbents can handicap new innovators, even in (and perhaps especially in) fast-moving fields.⁸⁰

As illustrated by MPHJ's broadcast demand letters, the potential liability is widely distributed, making such patents very powerful, even if they are eventually invalidated – a process that may take years. From the perspective of the Ginarte-Park index, these are “strong” patents and therefore evidence of patent system strength. Ginarte-Park does not take patent quality into account (understandably insofar as patent quality is notoriously difficult to measure). However, the effect is to confuse “strength” with how applicant-friendliness, as former EPO chief economist Bruno Van Pottelsberghe has shown.⁸¹

The fundamental political economy of the patent system runs deep. As one intellectual property treatise puts it:

[B]road notions of patent eligibility appear to be in the best interest of the patent bar, the PTO and the Federal Circuit. Workloads increase and regulatory authority expands when new industries become subject to the appropriations authorized by the patent law. Noticeably absent from this private, administrative and judicial structure is a high regard for the public interest.⁸²

The result is “mission creep” – an expanding regulatory environment that serves the economic interests of professionals, institutions, and incumbents. The first to take advantage benefit the most and become an instant constituency pressing for expansion and leading resistance to undoing the changes. Eventually, second comers embrace change because, going forward, they too are advantaged against new entrants. Thus, while most software publishers spoke against software patents at the PTO's [1994 hearings in San Jose](#) and many were targeted by IBM shortly thereafter,⁸³ software publishers eventually acquired patent portfolios that provided defense against competitors while establishing barriers against patent-poor newcomers.

⁷⁹ The software publishing industry grew up without patents, and no one has shown that the Federal Circuit's embrace of software patents in the early 1990s made any difference one way or the other in the pace of software innovation.

⁸⁰ Joe Mullin, [IBM sues Groupon over 1990s patents related to Prodigy](#), Ars Technica, March 3, 2016

⁸¹ Bruno van Pottelsberghe de la Potterie, footnote ___ above: “[F]or Ginarte and Park, the provisions for protection loss are considered to be a “weakness,” while preliminary injunctions, contributory infringement and burden-of-proof reversal are viewed as a “strength.”

⁸² Roger E. Schechter and John R. Thomas, *Intellectual Property - The Law of Copyrights, Patents and Trademark*, Thomson-West, 2003, p. 314.

⁸³ Ira Sager, [Big Blue Is Out To Collar Software Scofflaws](#), Business Week, March 16, 1997

With the scope of patent practice expanding, arbitrageurs saw that “strong” patents offered leverage against sunk investments in complex products – and that portfolios offered no defense against non-practicing entities who had no need for patent licenses from others. The automatic availability of injunctions under the old Federal Circuit rule (overturned by the *eBay* decision in 2006) created powerful incentives to invest in patents as distinct from genuine innovation that brings new products and services to market. The “troll” model was recognized for the first time in public hearings in 2002,⁸⁴ but a broader understanding of monetization strategies took time to materialize.

Intellectual Ventures, the largest patent aggregator, made an elaborate case for investing in patents, but its structure, funding, and practices were shrouded in nondisclosure agreements – one of many examples of secrecy used in combination with patents. Bound by nondisclosure agreements, many Silicon Valley firms invested in “IV” because they feared that they had to, lest they become targets for its vast holdings and secretive shell companies through which patents might be asserted. Although IV was founded in 2000, it was not until 2011 that the full scope of its activities became public through the investigations of [Tom Ewing and Robin Feldman](#).

IV and other aggregators contributed to a secondary market that encouraged producing companies to arbitrage their own portfolios by spinning out patents to speculators or patent assertion entities.⁸⁵ This allowed for more effective monetization since patent assertion specialists (non-practicing entities) were not vulnerable to counterclaims from targeted operating companies.⁸⁶ The next step was to sell patents to third parties to go after the original owner’s rivals, a strategy known as privateering.⁸⁷

There are clear benefits to doing indirectly what might be risky and unseemly to do directly. Although patent aggregators are not vulnerable to counterclaims because they produce nothing, the most visible of which are under reputational constraints. Ewing and Feldman found that Intellectual Ventures worked through 1276 identifiable shell companies. These vehicles facilitate purchasing by hiding the role of the deep pocketed aggregator, enable creative financing of litigation, and avoid any tarnishing of the aggregator’s reputation. Shell companies are notoriously a U.S. phenomenon, in part because incorporation is managed at the

⁸⁴ The term was voiced at the hearings by Peter Detkin (who reputedly coined the term), then at Intel but who would shortly thereafter leave Intel for Intellectual Ventures, by far the largest and best-known patent aggregator.

⁸⁵ One of the early examples is Micron’s shedding some 400 patents to Round Rock, an affiliate of Intellectual Ventures. The Round Rock pursued Elpida with the patents, which Micron was then able to acquire at bargain price. Patrick Anderson, [Smart Patent Plays By Micron And Apple Bookend Elpida's Demise](#), Seeking Alpha, July 10, 2012

⁸⁶ Ashby Jones, [Patent “Troll” Tactics Spread](#), WSJ, July 8, 2012

⁸⁷ Tom Ewing, [Indirect Exploitation of Intellectual Property Rights By Corporations and Investors](#), Hastings Science and Technology Law Journal, Winter 2012

state level under different standards. As expressed by Senator Carl Levin on the floor of the Senate:

[We are] introducing a bill designed to combat terrorism, money laundering, tax evasion, and other wrongdoing facilitated by U.S. corporations with hidden owners. This common sense bill would end the practice of our States forming about 2 million new corporations each year for unidentified persons, and instead require a list of the real owners to be submitted so that, if misconduct later occurred, law enforcement would have a trail to chase, instead of confronting what has all too often been a dead end.⁸⁸

This secrecy plays a major role in patent practice, making it difficult to understand secondary markets from the outside. The FTC began an informal investigation of patent assertion entities in [late 2012](#), and received budgetary approval for a study with subpoena power in mid-2014.

It is difficult for other governments to make sense of this secretive U.S.-centered strategic environment. They lack subpoena power in the U.S., but they can participate in patent markets, whether the patents are Chinese, European, or American. National governments may choose to stimulate patent markets within their borders for patents they issue, but this will be of interest primarily in the largest markets where the exclusionary force of patents is disproportionately powerful relative to the costs of enforcement.

Governments may still want their own competition agencies to flex their muscles to ensure that they retain broad enough authority, tools, and reach to counter the dominance of foreign-owned portfolios. For example, China takes a more expansive view of the essential facilities doctrine than Europe and especially the U.S. where the doctrine is nearly moribund.⁸⁹ China has also taken an expansive view of the reach of competition authorities based on extraterritorial effects.⁹⁰ The NDRC's recent Qualcomm ruling may be ambivalent in this regard, but South Korea's Fair Trade Commission has been quite explicit, giving cover to China.⁹¹

State investment

⁸⁸ Statement of Senator Carl Levin (D-Mich) On Introduction of the Incorporation Transparency and Law Enforcement Assistance Act, August 1, 2013.

⁸⁹ Yong Huang, Elizabeth Xiao-Ru Wang, & Roger Xin Zhang, Essential Facilities Doctrine and Its Application in Intellectual Property Space under China's Anti-Monopoly Law, *George Mason Law Review*, Vol 22 No 5 (2015)

⁹⁰ D. Daniel Sokol and Wentong Zheng, [FRAND \(And Industrial Policy\) in China](#), 2016. For criticism of China (and blaming U.S. antitrust agencies) from the perspective of the U.S. patent community see David Kappos, Keynote Talk, First Annual IP Management Conference: "[Intellectual Property Issues in a Global Context: Management & Policy Concerns](#)"

⁹¹ John Jurata and Issa Owens, [A new trade war: applying domestic antitrust law to foreign patents](#), *George Mason University Law Review*, 2015

If there are profits to be made from patent markets, it is reasonable to expect states with resources to invest in patent-based assets, especially if they are as liquid as the Kappos currency analogy suggests. As noted earlier, investment need not be through a sovereign patent fund in the model of a conventional state-owned sovereign wealth fund. Unlike the French sovereign fund (France Brevets), the Asian patent funds often involve contributions by and partnership with industry.⁹² Taiwan's fund is based at ITRI, a public research organization, but the funding has come entirely from industry.

Patent investments may be high-risk, but if they also offer the possibility of high returns, patents may figure into a diversified investment strategy. Private equity and hedge funds have invested in patent aggregators of different sorts, and some state pension funds have done well investing in these funds.⁹³ Several U.S. universities, including public universities, own interests in Intellectual Ventures – a revelation made only when compelled in litigation.⁹⁴

More direct state involvement offers the advantage that investments in patents can be exploited for different purposes as needs or opportunities arise. The learning by doing that direct management provides can be shared with domestic SMEs, who might otherwise be overwhelmed by the global patent landscape. Assistance for small innovators may be especially important in smaller countries where information asymmetries are felt more intensely and world-class expertise is limited. But even in large developed economies, the costs of navigating and enforcing patents are disproportionately high for small entities and lead to the perception that the system is biased against them.⁹⁵

Like small firms, small countries have problems. The patents they issue are less valuable because the protected markets are smaller. They are typically disadvantaged in terms of risk capital, patent expertise, language, and available public resources. Mid-sized developed economies such as Canada, Spain, and South Korea may have more in common than meets the eye. Their small size and unique strengths (as distinct from the largest economies with across-the-board strengths) may make it easier to develop national strategies for innovation and trade, but their differences, dispersion, modest size, and competing interests make geopolitical collaboration unlikely.

Nation states have also been slow to think about patents in aggregated economic terms. Patents are institutionally embedded in a legal framework, which operates only at the micro level – with no accountability for systemic effects. At the level of the individual patent, the argument persists that the legal force of a patent protects the small against the large. This is easy to visualize and undoubtedly

⁹² Seher Hussain, [Asia's patent funds – who they are, what they do](#), IAM Blog, Aug 23, 2013

⁹³ Drew DeSilver, [State's pension plan bets big on private equity](#), Seattle Times, Mar 2, 2013

⁹⁴ Dennis Crouch, [Intellectual Ventures: Revealing Investors](#), Patently-O, May 18, 2011

⁹⁵ The Berkeley survey of startups shows this perception to be strongest among software startups. See Ted Sichelman, [Startups & the Patent System: A Narrative](#), March 2012.

true in some contexts, but it is also sometimes true that patents give small patent holders undue leverage against large innovative producers.

In some countries, such as Germany, courts undertake to manage and limit costs since costs, including attorneys' fees, are customarily assessed against the losing party. However, German courts are generous with injunctive relief, which can impose a substantial unquantified risk on defendants.⁹⁶ As noted, Motorola secured an injunction based on infringement of standard-essential patents, which compelled Microsoft to move its European distribution center from Germany to Ireland. A jury in Microsoft's backyard then found Motorola demands excessive, in violation of its FRAND commitment; the jury awarded damages of \$14.52 million for this breach, far in excess of \$1.8 million in reasonable royalties that a judge had assessed for the patents.⁹⁷ The case elevates a remedy for infringement in one jurisdiction to damages assessed against the patent claimant based on a global contractual commitment tied to a global standard (FRAND).

Thus patent practice is reframed by global ICT standards into a regime based on an economic calculation of reasonableness, while supporting investment in standard-essential patents as a winner-take-all investment based on industry consensus. The importance of standards in international trade suggests a strong state interest in ensuring that domestic industries subscribing to global standards have freedom to operate and export. Yet compulsory licensing for ICT patents (as distinct from pharmaceutical patents) is not only suspect under TRIPS, it is ineffective in the country of destination. States may therefore choose to invest in SEPs – a solid investment as patents go, since industry worldwide needs a license, as well as a means to help domestic industries to export. Within a diversified portfolio SEPs should have a higher potential return with less risk than other patents.

As dark as patent markets are, the fact that they exist and attract private capital offers some assurance to state investors that expertise and risks can be shared with knowledgeable private investors. Like the misleading term, sovereign patent fund, a state-owned enterprise is too commonly assumed to mean full ownership and control. The reality is more diverse and nuanced. The TPP defines an SOE as more than 50% owned by the state, a comparatively restrictive definition; other agreements are more or less specific, some stressing practical control, analogous to the way that large but minority investments can exert effective control over a company. State ownership of shares can be enhanced by other forms of influence and benefit, such as availability of loans from state banks, access to government officials, or favorable regulatory treatment.

⁹⁶ The availability of injunctive relief has been driving a surge of administrative cases in China, in part because damage awards in courts have been small. See Jacob Schindler, [Administrative patent enforcement booms in China as rights holders chase quick injunctions](#), IAM Blog, Feb 19, 2016. Note that this is quite the opposite of the trend in the U.S., where injunctions against complex products have been difficult to get after *eBay v MercExchange* (2006).

⁹⁷ Brooks et al, [Ninth Circuit Upholds Landmark FRAND Decision and Jury Verdict](#), Orrick AntitrustWatch Blog, August 1, 2015

At the same time, a government-invested company can benefit from access to private capital, professional management, and the discipline of market. Private investment can be used insulate the state from commitments in international agreements – such as prohibitions against “forced technology transfer,” since such commitments do not apply directly to private firms.⁹⁸ Trade agreements, including the TPP, commonly dance around this issue. The TPP expressly provides:

No Party shall, in connection with the establishment, acquisition, expansion, management, conduct, operation, or sale or other disposition of an investment of an investor of a Party or of a non-Party in its territory, impose or enforce any requirement, or enforce any commitment or undertaking:

...

to transfer a particular technology, a production process or other proprietary knowledge to a person in its territory;

But then separately makes it clear (albeit in confusing terminology) that this only binds states:

This Article does not preclude enforcement of any commitment, undertaking or requirement between private parties, if a Party did not impose or require the commitment, undertaking or requirement.

“Party” here means signatory states, but “private party,” unlike “state-owned enterprise,” is left undefined.⁹⁹ This appears to create problems in a number of murky areas including enforcement of FRAND commitments, march-in rights under Bayh-Dole, and second source requirements in defense procurements (a factor in the rise of Silicon Valley during the Cold War¹⁰⁰).

This kind of restraint on public state action can induce not only strategic bias in policy development, but an increased use of public-private partnerships, private surrogates, or other informal or indirect actions. Risk and return can be structured in many different ways, allowing the state to fashion its participation as creatively -- and obscurely – as private sector interests do, including hiding behind shell companies and use of privateers. As noted by Tom Ewing: “Classical privateering was state-sponsored piracy. The government gave the privateer a “letter of marque and reprisal” that allowed him to seize the property

⁹⁸ Beyond the rhetoric of “force,” it is important to remember that access to technology is a legitimate commercial objective, but availability is likely to depend on bargaining power and sophistication. While a state could agree not to enforce certain contractual provisions in court, the contract could be subject to enforcement in another jurisdiction. Enforcement may not matter much if the arrangement is buried in complex, interdependent relationship.

⁹⁹ In some cases, the agreement is more specific. For example, Annex 15B of U.S.-Singapore FTA provides: “For purposes of this Annex, private parties may include designated monopolies or government enterprises, where such entities are not exercising delegated governmental authority as described in Articles 12.3.1(c)(i) and 12.3.2(b) (Designated Monopolies and Government Enterprises), respectively.”

¹⁰⁰ Annalee Saxenian, *Regional Advantage*, 1994, p. 45 (second-sourcing continued as customary through requirements of private customers)

of the state's enemies.” As Ewing also notes, granting letters of marque and reprisal is (like the clause authorizing patents) one of the enumerated powers of Congress in Article I Section 8 of the U.S. Constitution.

At a time when many firms have vast cash reserves and good investment opportunities are unappealing, there may be ample reason to invest in patent portfolios. While the speculative investments surrounding the smartphone wars may have diminished, some of the lessons remain. Google, Facebook, and Twitter have all found it necessary to acquire substantial numbers of patents for defense in order to defend their entry.¹⁰¹ In all these cases, the common source was IBM, so it is not hard to imagine a state-invested behemoth with a vast portfolio selling patents as entry tickets to export markets.

In the U.S., it is easy to forget that some countries have substantial sovereign wealth, whether it takes the form of SWFs, currency reserves, or the holdings of state development banks. While sovereign patent funds have recently attracted attention, especially when they litigate against producing companies, they are still far from the scale of Intellectual Ventures or defensive aggregator RPX. Yet to the extent patents gain credibility as free-standing investments – and especially if they offer the currency-like value promised by Kappos, they will be increasingly a subject of direct or indirect sovereign investment.

Investor-State Dispute Settlement (ISDS)

Trade agreements bind countries not companies. The WTO does not permit private firms to initiate complaints, but many bilateral treaties and some regional trade agreements, including NAFTA, allow private companies to initiate extra-legal proceedings against states under investor-state dispute settlement (ISDS) provisions. Originally ISDS was designed to discipline developing economies in order to attract foreign investors. However, it has expanded in practice (mission creep again) to shield multinationals from evolving regulatory practice, even in developed economies with advanced legal systems.

The ISDS proceeding is not available to a domestic corporation, unless they are able to game the system through a presence in a foreign country in order to initiate the arbitration – which then takes place outside of national (and international) legal systems. In addition to avoiding the rule of law, ISDS has damaged the case for international trade by elevating the interests of multinationals over the laws and regulations of developed democracies and providing them with an advantage over smaller, domestic competitors. On top of the opacity of the treaty negotiation (along with periodic leaks that serve as

¹⁰¹ Juan Carlos Perez, [Google Acquires More IBM Patents](#), PC World, Jan 3, 2012; Charles Arthur, [Facebook buys 750 IBM patents: but why does it need to fight Yahoo?](#), The Guardian, March 23, 2012. In Twitter's case the discussion with IBM may have begun with the threat of litigation; see Brid-Aine Parnell, [Twitter avoids IP face-off with Big Blue, will buy 900 IBM patents](#), The Register, Feb 3, 2014.

reminders of the opacity), ISDS has politicized trade liberalization in new ways, and allowed certain negative aspects to reinforce each other.

The political reaction has been most pronounced in environmental cases, but a couple of intellectual property cases have struck an emotional chord: the Eli Lilly case against Canada and the Philip Morris cases against Uruguay and Australia stand out. Using NAFTA, Eli Lilly has attacked the Canadian Supreme Court's interpretation of patent eligibility, implicitly attacking the sovereign-based territoriality of patents. The notorious Philip Morris attacks on plain-paper packaging of cigarettes (based on claims of trademark devaluation) stand as especially aggressive extensions of the global trading system. They were brought using country surrogates like Honduras under the WTO, ironically damaging the brand of WTO and trade agreements generally. The Australia ISDS case came through the backdoor of a most-favored-nations (MFN) clause in the bilateral agreement between Australia and Hong Kong.¹⁰²

The reaction against ISDS has been especially pronounced in Europe, where it has undercut support for the Transatlantic TIP and EU-Canada Comprehensive Economic and Trade Agreement (CETA). The "[toxicity](#)" of ISDS has been acknowledged and addressed by [proposing](#) a new "Investment Court System" with higher standards and increased accountability and transparency. However, this alternative has not been embraced by the U.S., while it has been viewed by critics as a mere rebranding of ISDS. By contrast, in the U.S., the USTR boasts "the United States has only been sued 17 times under any U.S. investment agreement and has never once lost a case. In some instances, we have even received compensation for having had to defend against a case in the first place."¹⁰³ Canada's legal system is no less developed, yet as of 2014, Canada had been sued 35 times under NAFTA alone, and had lost (or settled) six times.¹⁰⁴ The imperviousness of the U.S. may well be related to the fact that most of the disputes are handled in private by the International Centre for the Settlement of Investment Disputes. ICSID is an agency of the World Bank, which (as flaunted by the ICSID [homepage](#)) is based in Washington, DC, where it is subject to Congressional oversight.

The ISDS mission creep that limits the political freedom of economically advanced democracies in effect adds a new supranational regulatory layer to the global economy, although this is obscured by the fact that it enables private enterprises to regulate public agencies. In this regard, it contrasts dramatically with broader deregulatory trends over the past four decades – and particularly digitally enabled developments at the local level. The success of platforms like Airbnb and Uber is that transparency, trust, and reputation are able to substitute

¹⁰² Another example of mission creep. MFN clauses were designed to achieve tariff parity, not regulatory parity.

¹⁰³ USTR, [The Facts on Investor-State Dispute Settlement](#), Tradewinds, March 2014

¹⁰⁴ Sunny Freeman, [NAFTA's Chapter 11 Makes Canada Most-Sued Country Under Free Trade Tribunals](#), Huffington Post, Jan 14, 2015

for topdown regulation. By analogy, investors would be responsible for choosing what countries to invest in based on a totality of characteristics, without regard to availability of an extra-legal unaccountable Star Chamber looking out for their interests. To be sure, the TPP and the proposed Investment Court System are improvements, but they still represent additional layering in situations where the need is not apparent, high legal costs can skew outcomes, and decisions can undercut public sentiment for free trade and globalization. This layering further embeds legacy formulations against new evidence, new technologies, new business models and practices. Both ISDS and the proposed ICS favor legal ideology over economic discourse, although they implicitly trump national rule of law.¹⁰⁵

The TPP does so in a roundabout way that superficially makes it appear that intellectual property is excepted from ISDS.¹⁰⁶ The Investment chapter provides:

This Article shall not apply to the issuance of compulsory licences granted in relation to intellectual property rights in accordance with the TRIPS Agreement, or to the revocation, limitation or creation of intellectual property rights, to the extent that the issuance, revocation, limitation or creation is consistent with Chapter 18 (Intellectual Property) and the TRIPS Agreement. (Article 9.7, paragraph 5)¹⁰⁷

A close reading reveals that not only is intellectual property included, but the burden is on national governments to show the consistency of their laws and rulings with both TRIPS and the TPP intellectual property provisions.

Ironically, there is nothing to preclude state-owned or state-supported enterprises from taking advantage of ISDS. While most SOEs operate domestically, many operate across borders. Vattenfall, an SOE 100% owned by the Swedish government, has filed two ISDS claim against Germany – the first concerning environment regulations, which were then reduced to accommodate Vattenfall; the second, a demand for compensation phasing out nuclear power, is not yet resolved.¹⁰⁸ As is the case for many ISDS proceedings, the details remain private.

While the TPP addresses state-owned enterprises, it defines them narrowly. An equal public-private partnership is not an SOE under the TPP, so a jointly owned

¹⁰⁵ To be sure, ISDS tribunals are not of one mind in expanding their mission. Some of arbitrators are wary of expansionist decision making may undercut the legitimacy of the tribunals over the long term. M. Sornarajah, *Resistance and Change in the International Law on Foreign Investment* (2015)

¹⁰⁶ Steven Seidenberg, [TPP Strengthens Controversial IP Arbitration](#), IP-Watch, Nov 30, 2015

¹⁰⁷ See Seidenberg, *supra*. Footnote 19 to this paragraph reads:

For greater certainty, the Parties recognise that, for the purposes of this Article, the term “revocation” of intellectual property rights includes the cancellation or nullification of those rights, and the term “limitation” of intellectual property rights includes exceptions to those rights.

¹⁰⁸ Claire Provost and Matt Kennard, [The obscure legal system that lets corporations sue countries](#), The Guardian, June 10, 2015

firm or venture may benefit from deference in regulatory matters, loans from state banks, and informal relationships with state officials. Where association with the state is not desired, state ownership can be diluted, or even hidden through shell companies. Confidentiality of beneficial ownership is a benefit of incorporating in several U.S. states – Delaware, Nevada, and Wyoming.¹⁰⁹

Embedded in Tax

Tax laws represent a state commitment to favoring certain forms of investment, especially those that claim to promote innovation. These provisions are generally quantifiable subsidies raise concerns that they favor certain activities and stakeholders over others and may remain embedded whether or not they achieve expected results. They contribute to the complexity of tax laws and perceptions of favoritism toward those who are able to influence legislation and manipulate rules to their benefit.

Patent-related tax policies include:

R&D expensing. Businesses are able to deduct R&D activities as current expenditures, despite the fact that R&D is treated as capital investment in the System of National Accounts.

R&D tax credits. The U.S. tax credit applies to incremental R&D expenses (in excess of a previous period). This credit was recently made permanent and liberalized for the benefit of startups without profits, so it can now be used to reduce payroll taxes when there are no profits.

Freedom from ad valorem taxes. Real property and tangible personal property commonly incur ad valorem taxes such as annual property tax, transaction taxes, and import duties. Intellectual property does not incur such taxes.

Tax arbitrage

Digital and other intangible assets can be easily moved and transacted across borders, but the attribution and allocation of profit to digital services, software, and data is complicated and easily manipulated.¹¹⁰ Patents are favored in that they appear to be well-defined and measurable but are usually difficult to value, especially when there are many patents per product and families of patents from

¹⁰⁹ Bob Beck, [Why Wyoming's Laws Make It An Easy Tax Haven](#), NPR Morning Edition, April 8, 2016

¹¹⁰ As captured in the OECD Action Plan on Base Erosion and Profit Shifting:

The digital economy is characterised by an unparalleled reliance on intangible assets, the massive use of data (notably personal data), the widespread adoption of multi-sided business models capturing value from externalities generated by free products, and the difficulty of determining the jurisdiction in which value creation occurs. This raises fundamental questions as to how enterprises in the digital economy add value and make their profits....

different jurisdictions. Without a clear sense of value (and no “mark to market”), tax authorities are reluctant to challenge transfer pricing (between domestic and foreign affiliates) and attribution of income amongst intangible assets. In addition, multinationals have been able to take advantage of anomalies in tax treaties between nations: for example, the [“Double Irish with a Dutch Sandwich.”](#)

Patent boxes

A number of European countries have enacted “patent boxes” to lure corporate activity. However, DG Competition has found some to be impermissible state aid and has required modification – especially where national practices encouraged local stockpiling of foreign and domestic patents, whether or not related to R&D conducted locally.¹¹¹ The Obama administration has [opposed](#) congressional efforts to introduce this kind of subsidy in the U.S. Compared to the R&D tax credit, it injects a subsidy at the wrong place in the product development cycle – not at an early stage where uncertainty and potential spillovers are greatest but much later after the concept is proven, protected, and generating profit. It adds another layer of complexity to domestic and international taxation with new costs and new opportunities for manipulation, especially for multinational enterprises.¹¹² Variations such as [“knowledge development box”](#) or [“innovation box”](#) seek to avoid a narrow emphasis on patents but in doing so expand the definitional and transactional burden and further diminish the tax base. These subsidies and incentives feed elaborate tax strategies practiced by multinationals with the resources and the ability to shift patents across borders and among affiliates to best advantage. Although claimed to advance national competitiveness, this favors established and profitable multinationals over small domestic startups with few patents that have yet to turn a profit.

Discussion

At bottom, there are three nearly intractable problems underlying digital patents and patent practice: cost, quality, and proportionality. Policy perspectives vary according to market position, technological/business context, and professional discipline. However, the complexity of the system, the secrecy surrounding practice, and institutional weight of patent administration and adjudication mean that legal perspectives dominate. But the legal community has little interest in containing the scale and scope of the system. Many patent professionals resent the role of the U.S. Supreme Court in limiting patent-eligible subject matter, and in Europe the patent community tried unsuccessfully to keep the Court of Justice of the European Union from overseeing the new Unified Patent Court.

¹¹¹ For an account of how patent boxes have evolved, see Annette Alstadsæter, et al, [Patent Boxes Design, Patents Location and Local R&D](#), IPTS Working Paper on Corporate R&D and Innovation – No 6/2015

¹¹² Martin Sullivan, [Patent Box Tax Break: Good Intentions Gone Bad](#), Forbes, June 9, 2015.

The bureaucratic framework and the precedent-oriented inertia of legal reasoning keep political discussion bound to the individual patent and to distinctive, coherent, and marketable inventions such as the telephone or the airplane. This mythology that exalts the individual inventor over other less tangible, social aspects of innovation.¹¹³ In a digitally empowered world, the individual patent is ordinarily overshadowed by the operation of portfolios, while portfolio practice is obscured not only by costs of evaluating these many unique legal instruments, but by a dark web of confidential agreements. Despite the premise of public disclosure built into patent law, opacity and secrecy abound.

Trade negotiations like the TPP are negotiated in secret so as to avoid disruptive public debate on particulars. In the U.S., all debate over the 6000-page TPP is channeled into a simple up or down vote that precludes amendment and leaves little room for debate -- a process of extremely bounded rationality that is hard to explain in terms of democratic ideals.

The basic political economy of patents helps explain why it is so difficult to address the fundamental problems. It is not in the immediate economic interest of the professional community to limit scale and scope – or the many characteristics that give patents private value (“strength”). Aside from occasional hand-wringing, there is virtually no discussion of the cost of patents. The European Commission investigated insurance for patents in the early 2000s under the assumption that SMEs needed and wanted it in order to assert patents and in the belief that there was a well-functioning insurance market in the U.S. The project was abandoned after the Commission learned that the principal demand was for defensive insurance, that the patent insurance market in the U.S. was anemic,¹¹⁴ and that any subsidy scheme would be cumbersome and costly. However, there may be renewed interest in light of the costs that the pending Unified Patent Court may impose on SMEs.¹¹⁵

The cost issue arose recently in the U.S. when Intellectual Property Owners (IPO) succeeded in getting a “loser pays” provision into reform legislation in 2013. While “loser pays” is common in European laws, it would have been a radical departure for civil litigation in the U.S., where each party is normally responsible for its own attorneys’ fees, win or lose. But litigation is especially costly in the U.S., and the business culture is more litigious. The change would have pushed the winner-take-all character of the patent system to a new extreme, and the uncertainty surrounding patent litigation would have imposed disproportionate risk on small patent holders such as universities.¹¹⁶ The provision would have increased total costs because it would naturally entail

¹¹³ Mark A. Lemley, [The Myth of the Sole Inventor](#), 110 Michigan Law Review 709 (2012)

¹¹⁴ Patent infringement is not covered under standard errors and omissions policies. The very limited market for patent insurance is documented by the Betterley Report every April ([e.g. here](#)).

¹¹⁵ Louise Amar, [The European Commission’s take on the UPC’s impact on SMEs](#), UPC Blog, Jan 19, 2016

¹¹⁶ Under Bayh-Dole, universities must retain ownership of patents generated from federally funded research but may grant exclusive licenses.

fighting over the reasonableness of attorney expenses. The stand-off over implementation of “loser pays” ultimately played a large part in derailing new reform legislation in the U.S..

To some extent, the concern over cost in the U.S. has been mitigated by the availability of plaintiff representation based on contingency fees (typically half of the amount recovered). Yet it is demonstrably unfair that small plaintiffs get only half of economic damages, and lawyers are naturally reluctant to take cases when the amount in controversy is low, unless there is little chance of losing.

The cost problem is intimately related to the quality problem but they are rarely addressed together. Patent quality will remain limited if the USPTO spends only \$3713 per application and relies on college graduates with a B.S. as primary examiners. As a practical matter, this means that the determination of quality gets borne by the private sector – with the burden falling unevenly as the determination gets more involved and formal. Some scholars have justified this – even the use of simple registration instead of examination -- on the grounds that few patents are worth the expense of a rigorous examination at the front end.¹¹⁷ While this view is not widely accepted, it illuminates the real tradeoffs between certainty and expense that undermine the investment-promoting rationale of the patent system.¹¹⁸

Although quality and cost are clearly interdependent, they are framed very differently. Quality has become a perpetual mantra as new administrators take office and promise to do better, but remain dogged by specific evidence of failure such as EFF’s [Stupid Patent of the Month](#). However, the difficulty of measuring quality makes progress elusive. Ideals of precision and predictability – central to the rationale of promoting investment – can only be approached with increasing cost and delay, i.e., through litigation. Increased frequency of assertion by non-practicing entities leads to increasing concern about behavioral reputation. While shell companies asserting patents may not be concerned about reputation, companies that defend repeatedly against patent assertion entities must be. They may engage in scorched earth tactics, because they do want to be seen as easy targets.¹¹⁹

At the same time, portfolio-level licensing and cross-licensing diminishes the quality and cost problem for larger players. The ability to trade non-exclusive rights at scale partially solves the problem of large numbers of patents of indeterminate value through negotiations among peers by experienced professionals. Portfolios buy “freedom to operate” – this term, seldom heard

¹¹⁷ Mark A. Lemley, [Rational Ignorance at the Patent Office](#), Northwestern University Law Review, Vol. 95, No. 4, 2001

¹¹⁸ Taken to an extreme, this view advocates for an examination-free registration system such as utility models in China enjoy. The early U.S. patent system was registration-only, but this proved subject to abuse, and examination was introduced in 1836.

¹¹⁹ This is one possible explanation for Nokia’s success in invalidating patents as recounted above.

outside of the patent practice, reveals that large producing firms are effectively to buy their way out of the patent system, a luxury not available to small firms. Large firms have reason to cooperate in this way: They are likely to have a shared interest in expanding the market and, as is often the case in the digital sector, have multiple business relationships with each other.¹²⁰

But the differences in professional interest and perspective resist a common perspective on quality. For the lawyer, the test of quality is whether the patent is upheld by the highest court. For the engineer, the test at the patent level would be inventiveness, but in law this is a binary question of whether the invention is obvious or not.¹²¹ The test of obviousness is keyed to “the person having ordinary skill in the art” – a diminishing standard in a global economy where frontier innovation is led by the top 1%, not by journeymen. Simple behavioral economics says that my patents are better than yours, but an objective engineer might want a patent system that is aligned with her way of working creatively. In this case, patents should serve as “beacons of light,” not as landmines that require the constant vigilance of paraprofessionals and lawyers. I.e., the system should work as effectively to focus and contextualize digital knowledge as the [Orange Book](#) works for pharmaceuticals.

The low threshold for patentability is yet another “applicant friendly” subsidy, like the explicit dollar subsidy built into the front of the administrative process. Patent law is riddled with other indirect or implicit subsidies that cannot be quantified readily but are deeply embedded, such the burden placed on the examiner to show that a patent should not be granted, the *ex parte* nature of the examination process, and the burden placed on the defendant to show that patent should not have been granted.

Other implicit subsidies include automatic availability of continuations (a uniquely American concession to applicants) that make it impossible for the USPTO to conclusively reject patents.¹²² This makes it cumbersome to quantify the allowance rate for comparison with other patent offices, none of which permit automatic continuations. The burden of these implicit subsidies is an externality that is borne by other innovators. A landscape full of questionable patents imposes a cognitive burden, legal costs, and financial risks that should be factored into investment decisions but cannot be evaluated with much objectivity or confidence. Surveys, including the detailed Berkeley/Kauffman survey of startups, fail to come to grips with how startups handle these difficult tradeoffs. Academic research naturally focuses on private benefit, which can be measured

¹²⁰ In a very real sense, this worked, minimizing the case for policy intervention based on hold-up or royalty-stacking. It was badly disrupted in the smartphone wars, in part by the dramatic convergence of functionality and in part by Steve Jobs’ emotional response to Android (all the more remarkable in that Samsung was a major supplier of components to Apple).

¹²¹ Economists, by contrast, talk of the “height of the inventive step” as a continuous variable that can be tweaked along with breadth and duration.

¹²² Mark A. Lemley and Kimberley A. Moore, [Ending Abuse of Patent Continuations](#), Boston University Law Review, Vol. 84, p. 63, 2004

to some degree, and neglects risk and uncertainty, which cannot be measured.¹²³

One solution would be to improve quality and limit the proliferation of questionable patents by raising the statutory threshold from “ordinary” to “expert.” This would also make the standard less hypothetical since expertise is easier to specify and assess than ordinariness. In short, it would raise patent examination to something close to peer review and the Daubert standard for admitting expert testimony in court.¹²⁴ Of course, any substantial raising of the inventive step requirement would deflate the patent sector and draw fire for making the patent system less accessible.

Fortunately, there is some progress on proportionality. By ending the Federal Circuit’s rule of automatic injunctive relief, the Supreme Court has indirectly focused new attention on damages -- especially the meaning of “reasonable royalty”. Litigation around standard-essential patents puts the apportionment problem in a new context, in which the economic calculus can be made in the context of a complete global market. The calculation of damages is the one point where economics already enters the patent system, and this opening should be exploited further.¹²⁵

Nonetheless, there are contending perspectives within industry, as reflected in the split over the new IEEE patent policy, which represent differences in business model and economic interest. One side reflects the linear model of innovation, with patents protecting core inventions, which are then refined and fitted to innovative products and services. The other side stresses engineering and combinatorial innovation – assembling the varied functionality of technology into products and services in advance of the competition.

In terms of assessing reasonable royalties, this implies choosing between the primacy of patent markets and the primacy of product markets. However, patent markets remain dark and opaque, shrouded in NDAs. By contrast, product markets are based on the measurable, relatively transparent reality of global markets for recognized products and services. In digital technology, the distance between patents and products is vast, yet proportionality demands some effort to bridge that distance. Focusing on the small saleable unit as the IEEE policy and recent case law does is one step toward bridging that distance. Another is

¹²³ As the limited literature on patent insurance shows, it is also difficult to rationalize. See J. Rodrigo Fuentes, [Patent insurance: towards a more affordable, mandatory scheme?](#), Columbia Law Review, Vol 10, p. 267, 2009.

¹²⁴ Daubert was the first of a trilogy of Supreme Court cases that set the standard; see https://en.wikipedia.org/wiki/Daubert_standard

¹²⁵ The final recommendation of the 2003 FTC report reads: “Expand consideration of economic learning and competition policy concerns in patent law decisionmaking.”

understanding the ownership structure based on the number of patents and standards within products.¹²⁶

It remains extremely difficult to assess the private benefits and costs of patents, let alone the social benefits and costs. The AIPLA surveys afford a concrete sense of the most palpable private transaction costs – but not the costs associated with assertion prior to or otherwise independent of formal litigation. The naïve view focuses on the patent in hand from the perspective of the patent holder – not the possible counterparties to a patent, i.e., the aggregate uncertainty of widely dispersed liabilities.¹²⁷ These will be greater when the threshold of inventiveness is low and high levels of independent inventive activity increasing the likelihood of innocent infringement. At the same time, global-scale innovation and examination on the cheap limit private benefits because they increase the odds that further investigation will show the patent to be invalid based on prior. This skews the system in favor of large multinationals who can most efficiently navigate national patent thickets while reaping direct and indirect tax benefits.

Nearly 60 years ago, economist of knowledge Fritz Machlup famously wrote:

If we did not have a patent system, it would be irresponsible, on the basis of our present knowledge of its economic consequences, to recommend instituting one. But since we have had a patent system for a long time, it would be irresponsible, on the basis of our present knowledge, to recommend abolishing it.¹²⁸

By this reasoning, it was plainly irresponsible of the U.S. Court of Appeals for the Federal Circuit to unilaterally extend its own jurisdiction to embrace nontechnological subject matter, as it did in *State Street*.¹²⁹

60 years later, the patent system has become far more complex and embedded. It has been modestly internationalized by TRIPS and globalized in practice by global value chains and ICT standards – while remaining territorial in administration, law, and practice. It has been subsidized and exploited in ways

¹²⁶ See Biddle, et al, [How Many Standards in a Laptop](#), 2010 (finding 251). The number of patents in a standard varies greatly as shown [here](#). Conservative practice favors overdisclosure, so many declared patents are [not in fact essential](#).

¹²⁷ The only effort to measure net social benefits and costs remains Bessen and Meurer's *Patent Failure* (2008), which relies on public company records and event studies (effects of patent litigation on market value). They find a net benefit prior to effects of the Federal Circuit and a net cost thereafter, although a continuing net benefit for pharmaceuticals and chemicals.

¹²⁸ Fritz Machlup, *An Economic Review of the Patent System*, Study No.15 of Committee on Judiciary, Subcommittee on Patents, Trademarks, and Copyrights, 85th Congress, 2d Session, (1958), echoing his colleague Edith Penrose, in her 1951 book, *The Economics of the International Patent System*.

¹²⁹ Hence one of the principal recommendations of the 2003 FTC report (footnote ___ above) reads: "Consider possible harm to competition – along with other possible benefits and costs – before extending the scope of patentable subject matter."

that were not anticipated when Machlup wrote the foregoing as part of the Senate Committee's intensive examination of the U.S. patent system. Most importantly, the dramatic rise of ICT as a general purpose technology makes clear that the standard for "irresponsible" depends greatly on the context and methodology.¹³⁰

There is clearly demand for government-subsidized entitlements that can be asserted against rivals, cash-rich companies, or soft targets such as small businesses. But the effects of low quality patents in creating widely dispersed, contingent, largely undocumented liability are unknown, despite the economic stakes. Despite the dense interweaving of public and private functions, accountability is lacking. Despite greater attention from economists and empirically oriented scholars, survey data remains outdated (Carnegie-Mellon), semantically useless (NSF BRDIS), or selective (Berkeley study of startups). Studies by the USPTO's Office of Chief Economist, such as the report on "intellectual property intensive industries," amount to politically driven cheerleading.¹³¹ (The United Kingdom Intellectual Property Office (UKIPO), by contrast, stands out in its systematic [agenda setting](#) and willingness to tackle hard policy matters, such as [patent thickets](#).)

There are ways to alleviate these problems: raising the inventive step threshold, requiring the real-time reporting of patent assertions, patent office self-examination when patents are found invalid, a lesser presumption of validity to reflect the nature of ex parte examination, eliminating automatic continuations, etc.¹³² But such reforms would reduce the strategic scope of the patent system and would threaten tactical and strategic prerogatives for patent applicants. Politically, they may be impossible.

An alternative is to first build greater accountability into the system. One step that could help diminish the problems of quality, cost, and proportionality would

¹³⁰ Compare Bessen and Meurer (footnote __ above) finding dramatic inter-sector differences for aggregated private benefits and costs; FTC (footnote __ above) finding similarly large qualitative differences based on testimonial evidence; Edwin Mansfield, *Patents and Innovation: An Empirical Study*, *Management Science*, Vol. 32, No. 2. (Feb 1986), finding stark division between the industries he survey as to effects of the patent incentive; and Fontana, et al., [Reassessing Patent Propensity](#), *Research Policy*, October 2013, finding limited industry variation (and remarkably, finding that fewer than 10% of award-winning technologies were patented).

¹³¹ [Intellectual Property and the U.S. Economy: Industries in Focus](#), Department of Commerce 2012. "We defined patent-intensive industries as ones with above-average patent intensity (patent/job ratio) when comparing all industries." Naturally, aggregating all "above-average" industries results in impressively large numbers, but similar results could be engineered by aggregating "lawyer-intensive" industries – or even "sexual-harassment-intensive" industries.

Another example is the defensive study of software patent validity based on a handful of district court (and ITC) decisions. See footnote __ above.

¹³² One interesting proposal, which would do much to make markets for bare patents more transparent, is to require disclosure of license fees. See Mark Lemley and Nathan Myrhvold, [How to Make a Patent Market](#), *Hofstra Law Review*, Vol. 36, p. 257, 2008. The idea has received little if any traction.

be to subject patents to the same kind of annual *ad valorem* taxes that applies to real and personal property. This tax would be similar to the maintenance fees that are presently paid every few years, except that instead of supporting the full transaction costs of system, maintenance fees now just subsidize the examination process, encouraging overuse by applicants and grants instead of denials by the PTO. Instead, the tax would underwrite the costs of the judicial infrastructure used to litigate patents – just as fees must do for the new Unified Patent Court in Europe. It could subsidize costs of disputes for SMEs and universities, who are now disproportionately disadvantaged by the high cognitive burden and transaction costs – and will be further. Like maintenance fees, a tax would encourage the abandonment of worthless patents, thereby reducing the clutter and noise in the system. Self-reported value would create presumptions that could be applied to assess damages, transfer pricing, and compensation for public use.¹³³

Conclusion

For much of history, duties on incoming goods were a principal, if not primary source of revenue. Borders and location were dominant factors, just as they were for state-funded military ventures. Based on simple asymmetries in value from one place to another, traders arbitrated physical goods, opportunistically combining import and export. Today, trading takes place within a complex environment of FDI, capital flows, value chains, alliances, licenses, travel, immigration, and networks.

Digitization has blurred borders in many other ways – and not just at the international level. It has expanded the scope of economic activity – products, services, and business models. Software – infinitely functional, malleable, extensible, and versatile – is “eating the world.”¹³⁴ It has enabled multi-sided platforms and algorithmically empowered markets, proprietary ecosystems that overlap, cooperate, and compete with each other. These gigantic enterprises vie for attention, shaping how people organize their economic and social lives.

But policy oversight remains limited and constrained. Multilateralism has stalled. Policy development is channeled incrementally into trade strategies that draw in a widening range of policy domains. Unlike conventional democratic policy development, trade policy has become an exercise in geopolitical maneuvering and strategic prioritization.

The negotiations process wrapped in unique form of public secrecy, which in the U.S. is open to industry through the ITAC committees (individual members are listed but without their affiliation/employer). Drafts leak from time to time,

¹³³ Adding another layer to an already complex system adds further to the complexity of the system – just as the unitary patent adds to the complexity of the European patent system. It may make more sense to redesign maintenance fees to accomplish similar objectives.

¹³⁴ Marc Andreessen, [Why Software Is Eating The World](#), Wall Street Journal, August 20, 2011.

drawing attention to the undemocratic secrecy of the process. The drafts are inevitably disclaimed as works in progress, defusing public debate until a final unamendable text is released for approval, which to date has been nearly automatic. Much of the TPP reiterates the terms in bilateral treaties. Much is merely exhortative, aspirational, or expressive of intent to cooperate. Mandatory provisions are buried by the 6,000 pages, much as click-wrap licenses or consumer disclosures are obscured length and details of limited relevance.¹³⁵ This accretive process nevertheless assumes a practically immutable constitutional stature distributed over hundreds of lesser treaties and embracing an expanded ISDS as a global supreme court precedent and promising multinational enterprise a global common law of “legitimate expectations.”

Unbound by precedent and free from oversight, ISDS not only constrains the scope and adaptability of policymaking but burdens and embarrasses governments, undermining the authority and legitimacy of the state. The reaction against ISDS in Europe, where it resonates with resurgent nationalism, threatens to derail the Transatlantic Trade and Investment Partnership (TTIP). Since the U.S. hosts the principal ISDS forum (ICSID) and has never lost a dispute, it has largely avoided the ISDS controversy and has resisted the EU effort to create an alternative Investment Court System. For a home audience, the TPP is even pitched as a U.S. creation with the USTR website proclaiming that the agreement is “made in America.” TPP is presented as a counter to the Regional Comprehensive Economic Partnership (RCEP), which includes China, India, Japan, South Korea, and the 10 ASEAN countries. As expressed by President Obama: “When more than 95 percent of our potential customers live outside our borders, we can’t let countries like China write the rules of the global economy. We should write those rules....”¹³⁶ The trade pact rivalry takes on this larger significance after the launch of the Asian Infrastructure Investment Bank, initiated by China and perceived as competing with the World Bank.¹³⁷

The secretive negotiation of trade agreements and the rise of ISDS as a strategy benefiting particular economic actors make it easy to see a trend toward undermining national sovereignty and democratic processes in favor of private interests. Yet strategic policy development on behalf of private interests begets strategic reactions in which some governments are more willing than others to engage in new interventions: investing alongside domestic firms, expanding the scope of competition policy, extending tax breaks, or encouraging collective action to counter developments in other countries.

¹³⁵ Recently dramatized by the Norwegian Consumer Council’s reading of the terms and conditions for a typical number of apps on a smartphone. See [A 32-Hour Webcast of Norwegians Reading the Fine Print](#), Associated Press, May 26, 2016

¹³⁶ [Statement of the President on the Trans-Pacific Partnership](#), Oct 5, 2015

¹³⁷ Jane Perlez, [China Creates a World Bank of Its Own, and the U.S. Balks](#), New York Times, Dec 4, 2015

The digitally expanded scope for private action may outpace conventional policymaking, but it also expands opportunities for realigning governance, asset management, and knowledge-sharing between private and public domains. In fact, digitization has brought with new territory and new forms of organization that mix private and public attributes, such as standards development organizations, privately owned and operated markets, subsidized knowledge networks, public utility-like Internet services, massive exploitation of public sector information, etc.

Nearly 20 years ago, the Clinton Administration's [Framework for Global Electronic Commerce](#) set forth as its first principle: "The private sector should lead." This made sense in light of the opportunity, innovation, and creativity opened up by the Internet, the Web, and other digital technology. But the activity unleashed has also led to an intensification of public-private interaction, less as top-down regulation and more as how the relationship between what is "private" or "secret" and what is "public" or "open" should be configured – under different conditions in an unpredictable climate that pulls siloed policy domains and institutions into close proximity.

While many legal regimes involve a balancing of public and private interests, nowhere are public functions and private interests more entangled than in patent systems. Yet this interaction is shielded from oversight by the systemic complexity and the highly technical nature of subject matter and law. Patents defy the third principle of the Framework for Global Electronic Commerce: "Where governmental involvement is needed, its aim should be to support and enforce a predictable, minimalist, consistent and simple legal environment for commerce."

Ironically, it is in digital technology where this principle is most violated – where governmental intervention generates a firehose of legal instruments on the cheap, using an applicant friendly *ex parte* process that has no parallel in other government functions. Yet in the digital environment, the value of the individual patent is diluted, and advantage lies in numbers, size, and leverage – portfolios, patent funds, resources available to operate and litigate under uncertainty, market size, ability to gather intelligence and expertise, and the geo-economic clout to manage trade negotiations for national advantage. Because of the high transaction costs and portfolio-level efficiencies, increasing returns provide disproportionate advantage to scale.¹³⁸

The munificence of digital technology has created new layers of hundreds of thousands of legal instruments below the measured economy of traded goods, and globalization has opened up broad prospects for how these instruments can

¹³⁸ For example, the U.S. condemns state cyberespionage on behalf of specific companies, but not in support of trade negotiations on behalf of domestic industries. See David Sanger, [With Spy Charges, U.S. Draws a Line That Few Others Recognize](#), New York Times, May 19, 2014. How would this policy apply to a small country with a single firm in a trading sector?

be arbitrated and asserted -- by specialists, multinational enterprises, and national governments.

Despite their territorial limits, patents are routinely assigned and licensed across border – as are digital products, services, and data. From a distance, they may look as plentiful and fluid as money, as Under Secretary Kappos suggests, but the effects are far more complex and elusive.

A contrasting perspective is expressed by Jim Balsillie who speaks as an entrepreneur and former CEO of RIM (Blackberry), a company from a mid-level economy (Canada) that had to fight hard to succeed on a global scale:

The land of intellectual property rights is manipulative, predatory and vicious. And here is the best part: It's managed at the national level.¹³⁹

Balsillie's irony-laden observation paints the more realistic picture.

¹³⁹ Jim Balsillie, [Intellectual property must be protected](#), Waterloo Region Record, February 3, 2014