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## Global Strategic Patenting and Innovation—Policy and Research Implications

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An earlier version of the paper has been presented at the Harvard Kennedy School Mossavar-Rahmani Center for Business and Government research agenda workshop, "Governing Innovation: The Law, Economics, and Political Economy of Patent Systems," January 16-17, 2015.

# Global Strategic Patenting and Innovation – Policy and Research Implications<sup>1</sup>

by

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## Abstract

As an exclusionary property right, patents invite their use as a strategic weapon to shape markets and to reap monopoly rents through patent monetization. The increasing variety and global reach of Strategic Patenting strategies pose new and under-researched challenges for the *international distribution of innovation gains*.

This Think Piece explores the proliferation of strategic patenting strategies, and highlights the growing complexity and uncertainty of the international patent system that result from the increasing use of patents as market deterrents and as a new asset class. Part One of the paper introduces four manifestations of strategic patenting that are well documented in the literature, i.e. the use of standard-essential patents (SEPs) as entry deterrents; aggressive patent infringement litigation that has galvanized the smart phone wars, with Apple as the pioneer; the proliferation of patent monetization services; and the use of cross-border patent licensing as a tool for corporate transfer pricing and tax planning. While existing research provides important insights into the drivers, we lack systematic theoretical and empirical research on how strategic patenting affects the international distribution of innovation gains.

Part Two seeks to shed light on two recent forms of strategic patenting which need both theoretical and empirical case study research, i.e. the rise of Sovereign Patent Funds (SPFs), and first signs of patent-avoiding latecomer strategies, with China's Xiaomi as the most prominent example. The paper concludes with questions for policy and further research.

## About the author

**Dieter Ernst**, an East-West Center senior fellow, is an authority on global production networks and the internationalization of research and development in high-tech industries, with a focus on standards and intellectual property rights. His research examines corporate innovation strategies and innovation policies in the United States and in China, India, Taiwan, Korea, Malaysia and other emerging economies. The author has served as a member of the United States National Academies "Committee on Global Approaches to Advanced Computing"; senior advisor to the Organisation for Economic Co-operation and Development, Paris; research director of the Berkeley Roundtable on the International Economy at the University of California at Berkeley; professor of international business at the Copenhagen Business School; and scientific advisor to governments, private companies, and international institutions.

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## Overview of Topic

Intellectual property rights, and especially patents are widely considered to be the lifeblood of innovation which in turn creates new sources of growth and prosperity. However, the relationship between patents and innovation is much more complex than acknowledged in much of the current innovation policy rhetoric.

According to the US Patent and Trademark Office (USPTO), a patent is a negative right, granted by the US government to an inventor “to **exclude [DE]** others from making, using, offering for sale, or selling the invention throughout the United States or importing the invention into the United States for a limited time in exchange for public disclosure of the invention when the patent is granted.”<sup>2</sup> In other words, “... [p]atents are not rights to exploit technology. They are only rights to keep others from doing so – a negative right. Patents are fences, rather than the knowledge behind the fence.”<sup>3</sup>

As an exclusionary property right, patents invite their use as a **strategic weapon** to shape markets and to reap monopoly rents through patent monetization. In essence, “strategic patenting refers to the increasing use of patents as market entry deterrents and as a new asset class. Companies use a “strategic patent” to prevent “... a competitor not only from making the same product, but also from playing in the same market space. When a company holds a strategic patent, the competitor must expend efforts to innovate around the incumbent patent owner, which is, at a minimum, more expensive. In other cases, to avoid infringement, the competitor must make a product that does not hold the comparable consumer acceptance.”<sup>4</sup>

As documented in this paper, firms use an increasing variety of such strategic patenting strategies. In addition, these strategies are increasingly globalized, reflecting fundamental changes in the international patent system. Already in 2006, WIPO’s Francis Gurry emphasized the globalization of intellectual property (IP)<sup>5</sup>. Since then, the globalization of IP, and especially patents, has drastically increased, emerging as an important driver of strategic patenting. According to the *WIPO Statistics Database*, since 1995, patent filings worldwide surged from around 1 million to more than 2.57 million in 2013<sup>6</sup>. China’s patent boom has been the most important shift in the international patent system. Since 2011, more patents are filed at the patent office of China (SIPO) than at any other office in the

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<sup>2</sup> <http://www.uspto.gov/inventors/patents.jsp>

<sup>3</sup> Kahin, B., 2009, “Knowledge markets in Cyberspace?”: p.9, <http://www.ccianet.org/wp-content/uploads/library/Knowledge-Markets-in-Cyberspace.pdf>

<sup>4</sup> <http://ipassetmaximizerblog.com/strategic-patenting-part-1-why-so-few-patents-create-business-value/>. This definition reflects the view of a patent attorney. According to this source, examples of strategic patents are the Amazon.com “1 Click” patent and the Apple “Slide to Unlock” patents. Each of these resulted in the requirement that to avoid infringement, competitive products were required to use somewhat inelegant substitutions for the performance features found by consumers to uniquely address their unmet needs in the respective e-commerce and smartphone categories. In short, the aspects covered by these Amazon and Apple patents effectively covered the functional essence of why the customers found the products superior.

<sup>5</sup> Gurry, F., 2006, Intellectual property, knowledge policy and globalization, in: Squicciarini, M. and T. Loikkanen, 2006, *Going Global: The Challenges for Knowledge-based Economies*, Six Countries Program (6CP), [http://www.researchgate.net/publication/24116553\\_Going\\_Global\\_The\\_Challenges\\_for\\_Knowledge-based\\_Economies](http://www.researchgate.net/publication/24116553_Going_Global_The_Challenges_for_Knowledge-based_Economies)

<sup>6</sup> [http://www.wipo.int/pressroom/en/articles/2014/article\\_0018.html](http://www.wipo.int/pressroom/en/articles/2014/article_0018.html).

world. In 2013, China (32.1% of world total) and the US (22.3%) received more than half of global filings, while the European Patent Office (EPO) saw its share of the world total fall to 5.8%.<sup>7</sup>

A 2011 study by WIPO documents that an increasing share of inventions is being patented in more than one country, highlighting the internationalization of patenting as the primary driver of this global patent surge<sup>8</sup>. These shifts in the production and use of patents transform patent-related corporate strategies and government policies.

In short, the increasing variety and global reach of **Strategic Patenting** strategies pose new and under-researched challenges for the *international distribution of innovation gains*. It is time to take stock of what we know, and what we don't know but need to know, as well as to explore the current state (or lack of) policy debates.

This Think Piece explores the proliferation of **strategic patenting strategies**, and highlights the growing complexity and uncertainty of the international patent system that result from the increasing use of patents as market deterrents and as a new asset class. As discussed in an earlier paper, countries and companies worldwide seek to increase the gains for innovation from trade and from integration into global networks of production and innovation<sup>9</sup>. To improve the chances of success, future research needs to examine how the global proliferation of strategic patenting strategies is going to affect the international distribution of innovation gains.

The current paper lays the ground for such future impact-oriented research. **Part One** of the paper introduces four manifestations of strategic patenting that are well documented in the literature, i.e. the use of **standard-essential patents (SEPs) as entry deterrents**; **aggressive patent infringement litigation** that has galvanized the smart phone wars, with Apple as the pioneer; the proliferation of **patent monetization services**; and the use of **cross-border patent licensing as a tool for corporate transfer pricing and tax planning**. While existing research provides important insights into the drivers, we lack systematic theoretical and empirical research on how strategic **patenting** affects the international distribution of innovation gains.

**Part Two** seeks to shed light on two recent forms of strategic patenting which need both theoretical and empirical case study research, i.e. the rise of **Sovereign Patent Funds (SPFs)**, and first signs of **patent-avoiding latecomer strategies**, with China's Xiaomi as the most prominent example.

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<sup>7</sup> China's patent boom is truly breath-taking – "In the 20 years from 1991 to 2011, the number of patent filings increased more than 46-fold – from around 10,000 to more than half a million.... From 2009 to 2011, China accounted for close to three-quarters of the ...[patent application]...growth worldwide." ( Fink, C., 2013, "Intellectual property activity worldwide- key trends, facts, and figures", chapter 2 in Abbott, F.M., C.M. Correa, P. Drahos, eds, *Emerging Markets and the World Patent Order*, Edward Elgar, Cheltenham, UK.: p.39)

<sup>8</sup> Between 1995 and 2011, *first filings* (i.e. the initial presentation of a new invention) accounted for roughly 48.3% of the growth in patent filings worldwide. However, *subsequent filings* (i.e. patent applications for the same inventions, typically at the patent offices of other countries) were responsible for the remaining 51.7%. This contrasts with findings for the period of 1983 to 1990 when *first filings* accounted for more than 71% of the growth in patent filings worldwide. [http://www.wipo.int/edocs/mdocs/pct/en/pct\\_wg\\_4/pct\\_wg\\_4\\_4.pdf](http://www.wipo.int/edocs/mdocs/pct/en/pct_wg_4/pct_wg_4_4.pdf)

<sup>9</sup> Ernst, D., 2014, *Trade and Innovation in Global Networks – Regional Policy Implications, EWC-Working Paper , Economics Series, # 137, May 2014*, <http://www.eastwestcenter.org/publications/trade-and-innovation-in-global-networks-regional-policy-implications> , forthcoming as chapter in 2015 GCP publication (*Can policy follow the dynamics of global innovation platforms?*)

The paper concludes with questions for policy and further research.

### **Part One – Current Forms of Strategic Patenting**

Academic research highlights that the “...massive use of Strategic Patenting by firms ...[creates]... barriers to new entrants, ...[diverts] ... R & D budgets from research and ... [brings]... major uncertainty to new entrants who never know whether they infringe a patent or not. Universities that file patents may neglect basic research while firms that indulge in strategic patenting spend an increasing proportion of their R&D effort in legal expenses and defensive strategies. Last but not least, these changes could create dangerous speculative bubbles. In short, they could slow the pace of innovation and harm those industries that innovate the most.”<sup>10</sup> According to Noel and Schankerman (2006), “...[s]trategic patenting is widely believed to raise the costs of innovating, especially in industries characterised by cumulative innovation.”<sup>11</sup>

Strategic patenting relies on two instruments: a large patent portfolio which enhances bargaining power in patent disputes; and the fragmentation of patent rights (“patent thickets”) which increases the transaction costs of enforcement. In fact, major players in the telecommunications industry are all rushing to expand their patent portfolios through acquisitions<sup>12</sup>. And patent thickets keep growing, especially in the mobile communications industry.

For instance, a typical smartphone combines thousands of patentable functions<sup>13</sup>. “Each patent holder owns an exclusive right to one or many small features of the smart phone and can therefore try to prevent others from manufacturing the smart phone as a whole. As the numbers of players and patented features increase, the transaction costs of assembling a “completely licensed” smart phone become burdensome, because the manufacturer has to deal separately with the owner of each feature or patented component.”<sup>14</sup>

Figure 1 offers a visual representation of just the lawsuits associated with smart phone patents, ignoring for instance the various publicly-disclosed license agreements and other arrangements<sup>15</sup>.

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<sup>10</sup> Girard, B., 2012, “Does 'Strategic Patenting' Threaten Innovation? And What Could Happen If it Did”, January 15, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1985495](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1985495)

<sup>11</sup> Noel, M. and M. Schankerman, 2006, “Strategic Patenting and Software Innovation”, CEP Discussion Paper No 740, <http://cep.lse.ac.uk/pubs/download/dp0740.pdf>

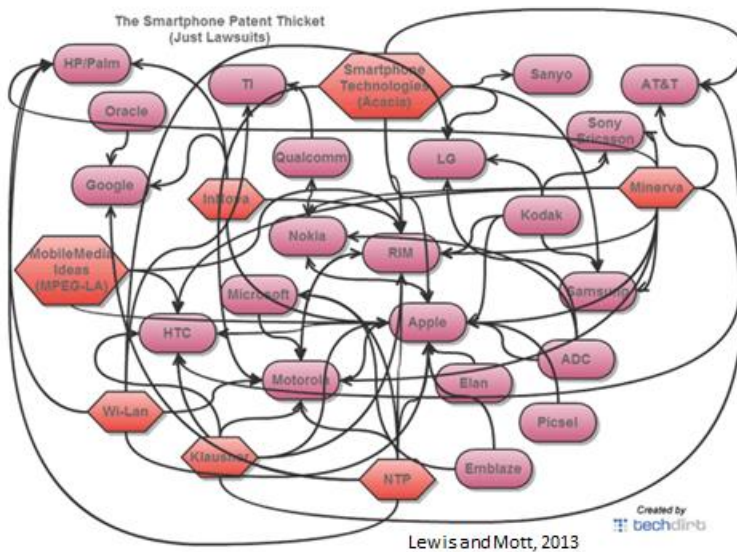
<sup>12</sup> See for instance the 2011 sale of Nortel’s patent portfolio to a consortium of companies for \$4.5 billion, and, again during 2011, Google’s acquisition of Motorola Mobility’s communications patent portfolio, reportedly for \$12.5 billion. ( <http://www.forbes.com/sites/quentinhardy/2011/08/15/google-buys-motorola-for-patent-parts/> ).

<sup>13</sup> In 2010, nearly 8000 patents held by 41 companies covered the 3G wireless communication capabilities of a typical smart phone. Confidential interview with smart phone company in June 2011, reported in Ernst, D., H. Lee and J. Kwak, 2014, “Standards, innovation and latecomer economic development: Conceptual issues and policy challenges”, *Telecommunications Policy*, 38: p.860.

<sup>14</sup> Lewis, J.I.D. and R.M.Mott, 2013, “The sky is not falling: Navigating the smartphone patent thicket” February 2013, [http://www.wipo.int/wipo\\_magazine/en/2013/01/article\\_0002.html](http://www.wipo.int/wipo_magazine/en/2013/01/article_0002.html) .

<sup>15</sup> Quoted in [http://www.wipo.int/wipo\\_magazine/en/2013/01/article\\_0002.html](http://www.wipo.int/wipo_magazine/en/2013/01/article_0002.html) .

Figure 1



### 1. Standard-essential patents (SEPs) as entry deterrents

As patent thickets keep growing, patents play an increasingly important role for technical standardization. Especially in the mobile communications industry, the key to competitive success is a broad portfolio of “essential patents,” which are necessary to produce any product that meets the specifications defined in the standard<sup>16</sup>.

In theory, a neat distinction is possible between standards that are a “public good” (free, collective good) and patents that are a “private good” (for private, exclusive use by patent owners)<sup>17</sup>. But in reality, tensions are rising between patents and standards: “... (w)hile technical standardization is meant to transform ideas into a public good, patent protection transforms them into a private good”<sup>18</sup>.

Brian Kahin highlights a second unresolved tension between patents and standards - a substantial gap between the degree of *de facto* oversight of patents and standards. “While standards are critically important for knowledge diffusion and innovation, they “... get trumped by the deeply institutionalized legal power of patents. The deference to patents is all the more remarkable given the very limited patent examination process and the presumption that the applicant is entitled to a patent unless the examiner can show otherwise. ...By contrast, standards are developed in an open and collaborative process among experts, so the final standard must stand up to a high degree of peer review.”<sup>19</sup>

<sup>16</sup> Patents are “essential” to a standard “when it is not possible to comply with the standard without infringing that intellectual property right” (Tapia, C. G. 2009. “Intellectual Property Rights, Technical Standards, and Licensing Practices (FRAND) in the Telecommunications Industry.” Ph.D. diss., Max Planck Institute for Intellectual Property, Competition, and Tax Law, Munich and Universität Augsburg.

<sup>17</sup> Economists typically define “public goods” by two qualities: “non-rivalry in consumption (i.e. they are not depleted by an additional user) and non-excludability (i.e. it is generally difficult or impossible to exclude people from its benefits, even if they are unwilling to pay for them)” (Baumol, W. J., and A. S. Blinder. 1991. *Economics: Principles and Policy*, 5th ed. Fort Worth, TX: Harcourt Brace Jovanovich.: p. 617).

<sup>18</sup> European Patent Office. 2007. *Scenarios for the Future*. Munich: EPO: p.93.

<sup>19</sup> Kahin, B., 2011, “Patents: A Singular Law for the Diversity of Innovation”, *Issues in Technology Innovation*, #10, June: page 6



These unresolved tensions between patents and standards provide ample opportunities for the use of **standard-essential patents (SEPs) as entry deterrents**. Research by Knut Blind and associates has documented the use of SEPs as a strategic weapon to prohibit, delay, or obstruct standardization processes<sup>20</sup>. This is the case, for instance, when incumbent market leaders pursue so-called **platform leadership strategies** through nominally open but *de facto* proprietary standards that are designed to block competitors and to deter new entrants.<sup>21</sup>

Research by Lemley, Shapiro and others on the licensing and disclosure of private standard-setting organizations documents the difficulties of finding fair and reasonable non-discriminatory (FRAND) compromises in private standard-setting organizations to reduce the negative impact of strategic patenting on innovation<sup>22</sup>. According to the Federal Reserve Bank of Philadelphia, finding fair and non-discriminatory compromises is made even more difficult by “the potential for opportunistic behavior by participants who own patents on a technology essential to the standard. There is a risk that without sufficient transparency and sufficiently strong mutual interests, network participants could make large investments to implement a standard only to be held up by a firm threatening to withhold a key piece of technology”<sup>23</sup> (Hunt et al. 2007). The study argues that

*... in all likelihood some kind of agreement would be reached, but on terms substantially worse than the participants initially expected. Indeed, the risk of such an outcome may discourage firms from adopting a standard or even participating in the standard-setting process. In other instances, awareness of a key blocking patent might lead to the adoption of a standard that poses less risk to participants but which is also technologically inferior (ibid.: 3).*

Recent attempts to address the international dimension of SEPs as entry deterrents indicate how much we still don't know about their impact on innovation gains, especially for latecomers to the Global Knowledge Economy. Y.A. Pai explores impediments to an effective global governance of SEPs, but limits the discussion to the role that the WTO regimes (through TRIPS and TBT agreements) might play in providing solutions to the unresolved issues of SEPs<sup>24</sup>. Li Xuan and An Baisheng argue that IPR misuse in standards may cause great difficulties for manufacturers in emerging and developing countries who are implementing standards, but the study fails to provide an empirical analysis of the impacts on the international distribution of innovation gains<sup>25</sup>.

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<sup>20</sup> Blind, K., N. Thumm, E. Iversen, K. Hossain, R. van Reckum, B. Rixius, R. Bierhals, and J. Sillwood, 2004, *Interaction between Standardization and Intellectual Property Rights. Final Report*, EUR 21074

<sup>21</sup> For example, Intel has sought to extend its control over microprocessors by creating widely-accepted architectural designs that increase the processing requirements of electronic systems and, hence, the market for Intel's microprocessors (Gawer, A., and R. Henderson. 2007. “Platform Owner Entry and Innovation in Complementary Markets: Evidence from Intel.” *NBER Working Paper 11852*. )

<sup>22</sup> For instance, Lemley, M.A. 2002. “Intellectual Property Rights and Standard-Setting Organizations.” *California Law Review* 90: 1889-981; and Lemley, M.A., and C. Shapiro. 2007. “Patent Holdup and Royalty Stacking.” *Texas Law Review* 85:1991-2041.

<sup>23</sup> Hunt, R. M., S. Simojoki, and T. Takalo. 2007. “Intellectual Property Rights and Standard Setting in Financial Services: The Case of the Single European Payments Area.” Working Paper No. 07-20, Research Department, Federal Reserve Bank of Philadelphia.

<sup>24</sup> See Pai, Y, 2014, “Standard-essential Patents. A Prolegomena”, *Journal of Intellectual Property Rights*, Vol. 19, January: pp.59-66.

<sup>25</sup> Li, Xuan and An, Baisheng, 2009, *IPR Misues: The Core Issue in Standards and Patents*, *South Centre Research papers 21*, June, South Centre, Geneva

An important recent *National Academies* study documents that China's standardization strategy leads to conflicts with foreign firms and governments, providing illustrative examples of such conflicts and highlights how Chinese stakeholders respond to foreign complaints<sup>26</sup>. But the study focuses on a static assessment of China's compliance with existing approaches to patent management in standards, and fails to address the multiple implementation challenges that countries like China face who are latecomers to the international patent and standardization systems<sup>27</sup>.

The same study by the *National Academies* however makes an important contribution to the reform of licensing terms for SEPs within Standard Development Organizations (SDOs), drawing on the work by Jorge Contreras, who proposes an SDO-driven approach to addressing the uncertainty of RAND commitments that is based on certain beneficial attributes of patent pools<sup>28</sup>. Drawing on these ideas, an important new development aimed at reducing the negative effects of SEPs is the decision, on February 8, 2015, by the Board of Directors of the Institute of Electrical and Electronics Engineers (IEEE) to change the organization's patent policy, committing IEEE members to license patents to users of IEEE standards on terms that are "fair, reasonable and nondiscriminatory" (FRAND). According to Jorge Contreras, "the IEEE's policy amendments offer much-needed clarity to the murky world of FRAND commitments, and it is hoped that other SSOs will soon follow with clarifications of their own patent policies."<sup>29</sup>

While this change in IEEE policy is fiercely resisted by owners of large patent portfolios like Qualcomm and Ericsson, there is reason for cautious optimism. In fact, IEEE obtained clearance for the amendments from the Department of Justice, which issued a favorable [Business Review Letter](#), concluding that the amendments 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."<sup>30</sup>

It is too early however to assess how effective large patent portfolio owners will be in their efforts to block the effective implementation of this new IEEE SEP-related policy<sup>31</sup>. In light of the deep rift between what Contreras calls the **patent-centric** (Qualcomm, Ericsson) and **product-centric firms** (IBM, Intel), it is even more uncertain is whether other SDOs like ETSI will follow suit and approve changes along the line of the IEEE new patent policy.

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<sup>26</sup> The National Academies, 2013, [Patent Challenges for Standard-Setting in the Global Economy](#), Board on Science, Technology and Economic Policy, The National Academies, October.

<sup>27</sup> For an analysis of China's standardization strategy, see Ernst, D., 2011, *Indigenous Innovation and Globalization: The Challenge for China's Standardization Strategy*, UC Institute on Global Conflict and Cooperation; La Jolla, CA and East-West Center, Honolulu, HI., 123 pages <http://www.EastWestCenter.org/pubs/3904> [Published in Chinese at the University of International Business and Economics Press in Beijing, 自主创新与全球化：中国标准化战略所面临的挑战]

<sup>28</sup> Contreras, J., 2012, Rethinking RAND: DSO-Based Approaches to Patent Licensing Commitments." Paper presented at the ITU Patent Roundtable, International Telecommunications Union, Geneva, October 10.

[http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1030&context=fac\\_works\\_papers](http://digitalcommons.wcl.american.edu/cgi/viewcontent.cgi?article=1030&context=fac_works_papers)

<sup>29</sup> Contreras, J.L., 2015, IEEE Amends its Patent (FRAND) Policy, February 9,

<http://patentlyo.com/patent/2015/02/amends-patent-policy.html>

<sup>30</sup> [http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2015/02/02/ieee\\_business\\_review\\_letter.pdf](http://www.justice.gov/sites/default/files/opa/press-releases/attachments/2015/02/02/ieee_business_review_letter.pdf)

<sup>31</sup> <http://www.wsj.com/articles/patent-holders-fear-weaker-tech-role-1423442219>

## 2. Aggressive patent infringement litigation and the smart phone wars

Patent litigation concerning smartphone technology began in late 2009 – Nokia (which then was still the industry leader) sued Apple over 10 patents, while Apple countersued Nokia for infringement of 13 patents<sup>32</sup>. The Nokia-Apple litigation quickly expanded from district courts to the International Trade Commission, and it opened the door for other companies to sue competitors for smartphone patent infringement.

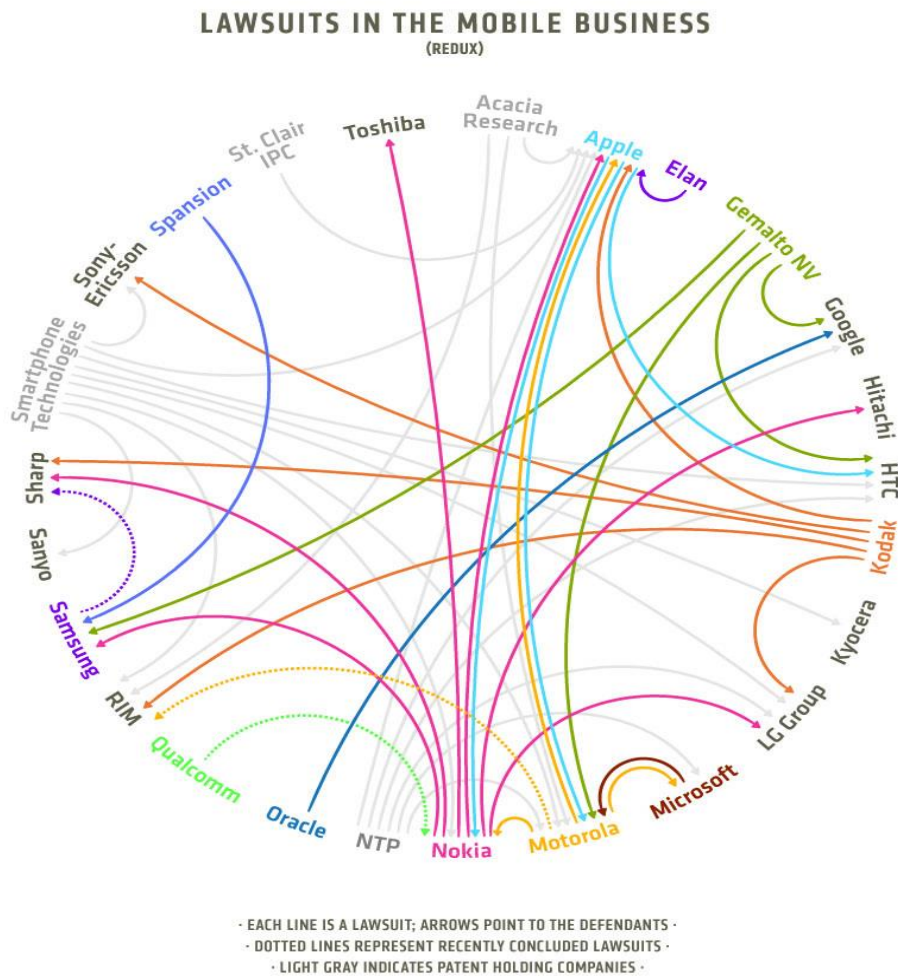
All major players in the smart phone industries are litigating each other. An illustrative list includes (Lavian, 2014)

- Apple vs. HTC: 20 software patents
- ELAN vs. Apple: touchscreen patents
- Oracle vs. Google: Java patents
- Qualcomm vs. Nokia: 3G tech.
- Apple vs. Nokia: data and speech coding
- Nokia vs. Apple: 2G, 3G and Wi-Fi tech

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<sup>32</sup> Lavian, T., 2014, *Wireless Mobile Devices: The Smartphone Patent War*, <http://www.cs.berkeley.edu/~tlavian/Spring2014/ClassMaterial.html>

**Figure 2** below demonstrates the intensity that mutual patent litigation in the smart phone industry has reached by mid-2011. Apple, Nokia and Kodak stand out as initiators.



Source: <http://www.neatorama.com/2011/07/31/lawsuits-in-the-mobile-business/>

A recent Fordham University study, prepared for WIPO, documents the pioneering role that Apple is playing in developing increasingly aggressive forms of **patent infringement litigation** that have galvanized the smart phone wars. The study finds: “Apple has a uniquely aggressive litigation history when compared to the rest of the market leaders and Apple’s ... aggressive litigation posture may be spurring litigation throughout the market and may be motivating competitors to acquire additional patents in order to help them strengthen their defensive position.”<sup>33</sup>

In fact, after Apple’s broad patent litigation was filed in 2011, all the main players in the global smart phone value chain have followed suit with their own aggressive patent **infringement litigation** schemes.

<sup>33</sup> Quoted from *The Impact of the Acquisition and Use of Patents on the Smartphone Industry*, study prepared for WIPO under a Special Services Agreement, at [/media/docs/2013/08/clip\\_study.pdf](http://media/docs/2013/08/clip_study.pdf), December 14, 2012.

There is a growing academic literature on smart phone patent wars. A study by Ronald A. Cass suggests two approaches to fix the problem: “One factor, the identity of the enterprise asserting patent rights, already is being used by courts in considering appropriate patent infringement remedies but its use needs to be refined. The other factor, patent quality — especially in software patents, where the existence of parallel schemes of intellectual property protection exacerbates quality problems — is even more critical to the way the system operates. Addressing the patent quality issue (which is distinct from patent clarity or patent notice) can do more than other reforms to reduce costs without reducing innovation incentives.”<sup>34</sup>

A recent paper by two Qualcomm executives argues that the rise of patent litigation activity in the smart phone industry “may be explained by industry dynamics rather than related to patents.”<sup>35</sup> And data for 2014, reported by Unified Patents (a group of technology companies that pool resources to fend off patent claims) indicate a decline in total patent lawsuits<sup>36</sup>. But the same report also documents that the numbers of patent litigations are still historically high, and that it is expensive for smaller companies, and especially those from developing countries, to fend off claims.

Most importantly, however, we still lack systematic theoretical and empirical research on how patent **infringement litigation** affects the international distribution of innovation gains.

### **3. The proliferation of patent monetization services**

A growing body of patent research seeks to document the proliferation of patent **monetization services** through companies like Intellectual Ventures or IPNav. A recent important study, commissioned by the Government Accountability Office (GAO) for the **America Invents Act**, defines patent **monetization companies** as “those entities whose primary focus is deriving income from licensing and litigation, as opposed to making products”.<sup>37</sup>

The opening statement of that study highlights the urgent need for theoretical and empirical research on this largely unknown underbelly of the U.S. patent system:

*“ Any discussion of flaws in the United States patent system inevitably turns to the system’s modern villain: non-practicing entities, known more colorfully as patent trolls. For many years, however, discussions about non-practicing entities have been long on speculation and short on data.” (Ibid.: p.357)*

A key finding of the above study is that “... lawsuits filed by patent monetizers are on the rise, while lawsuits filed by operating companies have fallen.... Patent monetization entities play a role in a substantial portion of the lawsuits filed today. The results are even more striking, given that the study

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<sup>34</sup> Cass, R.A., 2014, “Patent Litigants, Patent Quality, and Software: Lessons from the Smartphone Wars”, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2431285##](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2431285##)

<sup>35</sup> Gupta, K. and M. Snyder, 2014, “Smart Phone Litigation and Standard Essential Patents”. [http://www.law.northwestern.edu/research-faculty/searlecenter/events/entrepreneur/documents/Gupta\\_smartphone-litigation-working-paper.pdf](http://www.law.northwestern.edu/research-faculty/searlecenter/events/entrepreneur/documents/Gupta_smartphone-litigation-working-paper.pdf), May.

<sup>36</sup> Becker, S., 2014, “Patent Lawsuits as Business Model Erodes as Rules Tighten”, *Bloomberg*, <http://www.bloomberg.com/news/print/2014-10-29/patent-lawsuits-as-business-model-erodes-as-rules-tighten.html>

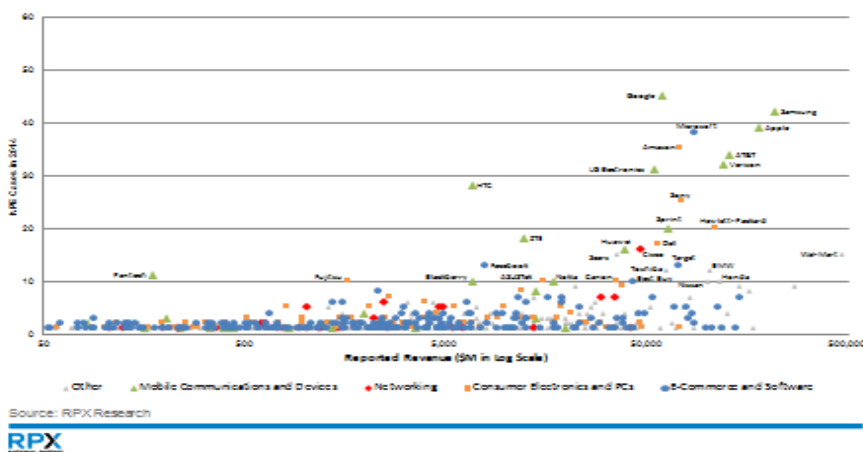
<sup>37</sup> Jeruss, S., R. Feldman & J. Walker, 2012, *The American Invents Act 500: Effects of Patent Monetization Entities on US Litigation*, 11 *Duke L. & Tech. Rev.* 357 (2012-2013): p.361. <http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1239&context=dltr>

examined only disputes that progressed to the courtroom. ... Thus, the findings likely understate the true impact of patent monetization entities on the patent system, and on the economy, as a whole.”(Jeruss et al, 2014: p.4) This important caveat is in line with the “light litigation” business model described by IPNAV: “At IPNAV, we’re not afraid to litigate, and we work with first-rate litigators, but we’ve found that alternatives to litigation often produce better and faster results.”<sup>38</sup>

According to data provided by RPX Research, a leading provider of technology commercialization management services<sup>39</sup>, no company, irrespective of size and nationality is immune against patent litigation from trolls (see Figure 3 below). RPX estimates the total cost to industry to resolve patent litigation by trolls to add up to \$ 13 billion during 2014.

**Figure 3**

**No One Is Immune Against Patent Litigation from Trolls**  
~2,000 Unique Companies Sued in 2014



An important new study by Robin Feldman and Mark Lemley finds that licensing as a result of a patent request or lawsuit from a patent troll, rarely, if ever, led to new products and services<sup>40</sup>. Equally important, such licenses rarely, if ever, included any technology transfer, transfer of personnel or consulting arrangements, or joint ventures. According to Feldman, most patent licenses from assertion “... are simply about paying for the freedom to keep doing what the licensee was already doing.”<sup>41</sup> But even more disconcerting is the study’s finding that the impact of patent licensing on innovation is also dismal, even when the licensing requests or lawsuits came from product-producing companies and from universities. The authors conclude that their findings “... Suggest that licensing from patent demands is not serving much of an innovation promotion function at all — no matter what type of party initiates the licensing demand.”<sup>42</sup>

<sup>38</sup> <http://www.ipnav.com/>

<sup>39</sup> [http://www.rpxgroup.com/about\\_us/history](http://www.rpxgroup.com/about_us/history)

<sup>40</sup> Feldman, Robin and Lemley, Mark A., Does Patent Licensing Mean Innovation? (February 15, 2015). Available at SSRN: <http://ssrn.com/abstract=2565292>

<sup>41</sup> <http://www.uchastings.edu/news/articles/2015/02/feldman-lemley-assertion-study.php>

<sup>42</sup> <http://www.uchastings.edu/news/articles/2015/02/feldman-lemley-assertion-study.php>

After initially being focused on the US, the patent monetization business is now being internationalized, with new players in Europe, but also in Asia. Prominent examples in Asia include Shanghai based RuiZhi Ventures, set up by Gustav Alray, a former investment manager with Intel Capital, and Transpacific IP in Singapore, established by Guy Proulx, a former advisor to Asian technology start-ups on IP issues.

Building on the path-breaking research of the above study by Feldman and Lemley, it is time for theoretical and empirical research on the internationalization of patent monetization services, and implications for the international distribution of innovation gains.

#### **4. Cross-border patent licensing as a tool for corporate transfer pricing and tax planning.**

Multinational corporations use intellectual property (IP) to avoid taxes on a massive scale, by transferring their IP to tax havens for artificially low prices<sup>43</sup>. Economists estimate that this abuse costs the U.S. Treasury as much as \$90 billion each year<sup>44</sup>. In a recent paper in the *Journal of Economic Perspectives*, Gabriel Zucman concludes that profit-shifting to low-tax jurisdictions reduces the tax bill of US-owned companies by about 20 percent<sup>45</sup>.

Commercial consulting reports on tax planning through patent licensing provide advice to MNCs on how to arbitrage existing national tax regimes<sup>46</sup>. However, there is very little coverage of this abuse of cross-border patent licensing in scholarly research on strategic patenting. Ove Granstrand, a leading scholar on the economics of the patent system, singles out two questions that thus far have received only marginal attention: “How and how much are cross-border IP licensing used for income shifting by MNCs and NPEs for tax planning/avoidance and what is the role of different tax regimes like territorial taxation?”<sup>47</sup>

As a first step towards identifying possible impacts on the distribution of innovation gains, detailed theoretical and case study research is needed, in order to identify the rationale that shapes how MNCs use cross-border patent licensing as a tool for corporate transfer pricing and tax planning.

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<sup>43</sup> For details on how multinational corporations use cross-border patent licensing and other forms of “creative” IP transactions to avoid taxes on a massive scale, see for instance Duhigg, C. and D. Kocieniewski, 2012, “How Apple Sidesteps Billions in Taxes”, *New York Times*, April 29; Hook, J. and D. Yadron, 2013, “Apple CEO Tim Cook, Lawmakers Square Off Over Taxes”, *Wall Street Journal*, May 22; Schechner, S., 2014, “Google’s Tax Setup Faces French Challenge”, *Wall Street Journal*, Oct. 9, 2014.

<sup>44</sup> Blair-Stanke, A., 2015, Intellectual Property Law Solutions to Tax Avoidance, *UCLA Law Review*, 2, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2446259](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2446259)

Andrew Blair-Stanke

<sup>45</sup> Zucman, G., 2014, “Taxing across Borders: Tracking Personal Wealth and Corporate Profits”, *Journal of Economic Perspectives*, Volume 28, Number 4—Fall 2014: page 130.

<sup>46</sup> For instance, Bloomberg’s *The Intellectual Property: Acquisition, Development and Ownership*, No. 557-2nd portfolio describes the rules governing U.S. federal income tax treatment of the costs of developing, acquiring and owning patents, copyrights, know-how and trade secrets (referred to generically as “know-how”), and trademarks and trade names, along with a fifth type of intellectual property, computer software, that can be protected as all or a combination of a patent, know-how and copyright. See <http://www.bna.com/Tax-Planning-Patents-p7547/>

<sup>47</sup> Granstrand, O., 2014, *Suggestions for further research on the Patent system*, Submitted to the Harvard/MIT/INET/CIGI research agenda workshop: “Governing Innovation: the law, economics, and political economy of patent systems.” January 16-17, 2015 at the Harvard Kennedy School: page 2, <http://www.hks.harvard.edu/content/download/73335/1670947/version/1/file/IP-research+suggs.pdf>

## Part Two – Emerging Incarnations of Global Strategic Patenting

Two recent forms of strategic patenting need both theoretical and empirical case study research, i.e. the rise of **Sovereign Patent Funds (SPFs)** and first signs of **patent-avoiding latecomer strategies**, with China's Xiaomi as the most prominent example.

### 1. Sovereign Patent Funds (SPFs)

Strategic patenting strategies are no longer restricted to private business. With the rise of **Sovereign Patent Funds (SPFs)**, Governments are now seeking to achieve a variety of national economic benefits, ranging from direct monetization through licensing or litigation to defensive strategies that protect vulnerable sectors.

Emulating strategic patenting strategies developed by MNCs like GE, IBM, etc., governments in countries such as France, Korea, Taiwan, Japan, and China are now searching for ways to develop effective business models for SPFs. This state-centered approach to strategic patenting highlights “the key and growing role of government in the realm of IP and innovation.”<sup>48</sup>

On the positive side, SPFs could improve the distribution of innovation gains, by helping to strengthen the patent management capabilities especially of SMEs, in particular the capacity to assess the value of their patents and monetize them through the creation of licensing programs.

But the primary objective for governments to participate in strategic patenting is to **protect the domestic companies from patent litigation from foreign companies**, by assembling a significant national patent portfolio and establishing a credible threat of potential retaliatory action. SPFs may also acquire particular patents in an effort to “dry out” the market and prevent foreign competitors or trolls from acquiring valuable patents that could be used against domestic firms.

Some observers argue that in contrast to private strategic patenting strategies, “... SPFs may have fewer incentives than private firms to quickly monetize patents through litigation...[because]...the provision of government support ... allows them to adopt a more long-term approach to investment than private sector funds.” (Clarke, 2014: p.3) Others argue however that “...even if the “public” side of the partnership may be more interested in strategic considerations, the “private” side is going to be most interested in making money.”<sup>49</sup>

Critics argue that SPFs “could end up with a large number of valueless patents aggregated at high cost.”<sup>50</sup> In addition, SPFs could have a disruptive impact on trade as a new type of technical barrier to trade (TBT). Some observers emphasize that the US government takes a negative view of SPFs as an unwarranted and inherently inefficient government intervention into the free market. Hence, “establishing an SPF could theoretically make the creator of such funds a target for US legal action in forum such as the WTO. More broadly, the establishment of such a fund could undermine relations with the US policy-makers and expose the creating country to the risk retaliatory action. ” (Clarke, 2014:p.10)

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<sup>48</sup> Clarke, W., 2014, *The Rise of Sovereign Patent Funds – Insights and Implications*, Center for Digital Entrepreneurship + Economic Performance (DEEP), Waterloo, Ontario, September.

<sup>49</sup> IPNAV, 2013, “Sovereign patent funds change the patent assertion scene”, December 23, <http://www.ipnav.com/blog/sovereign-patent-funds-change-the-patent-assertion-scene/?printPDF>

<sup>50</sup> Expert Group on IPR Valorisation, 2012, *Options for an EU Instrument for Patent Valorisation*, [http://ec.europa.eu/enterprise/policies/innovation/files/options-eu-instrument-patent-valorisation\\_en.pdf](http://ec.europa.eu/enterprise/policies/innovation/files/options-eu-instrument-patent-valorisation_en.pdf)



Probably the most important impediment to the establishment of SPFs are huge and under-researched implementation issues, especially with regard to obtaining sufficient financial and human capital and the organizational design and governance structure of such SPFs. In fact, despite the hype created in the media about the threat from SPFs as “state-sponsored patent trolls”, SPFs are facing considerable birth pains. Just three such SPFs seem to work with a clear strategic focus: *France Brevets*, *IPBridge Japan*, and *Intellectual Discovery Korea*. And only France Brevets has managed to sign a corporate license with LG Electronics as a result of litigation.<sup>51</sup> Taiwan and China are still searching for a viable business model.

Interviews with industry insiders in Taiwan, Korea and Japan, indicate that SPFs can only work if the following conditions are in place:

- Companies must be motivated to invest in IP development and management capabilities, which is driven by market dynamics. If the companies are not the drivers, very little will happen.
- The primary task of SPFs is to support the efforts of those companies (especially young, small companies with new ideas) to develop a broad portfolio of IP development and management capabilities.
- The industry structure and business culture must be conducive for this type of public-private dialogue and partnership.
- These support institutions and incentives must be limited in duration (but we know how difficult it is to discontinue such support programs).

Despite these caveats, it is likely that SPFs will gain ground over time as a new class of Technical Barriers to Trade (TBTs). Hence, research is needed on the drivers and emerging business models of SPFs to explore how these emerging private-public strategic patenting partnerships will affect the international distribution of innovation gains from the patent system.

## 2. Patent-avoiding Latecomer Strategies

Finally, the meteoric rise of Chinese vendors of low-cost smart phones despite their insignificant investment in R&D and patent development raises important and as yet under-researched questions: Are **patent-avoiding latecomer strategies** emerging as a new type of **reverse global strategic patenting strategy** which companies in China and other developing countries could use to overcome their latecomer disadvantages? How sustainable might these strategies be as sources of catching-up, defined as “the process in which a developing country narrows the gap in productivity and income relative to a leading country”?<sup>52</sup> And how might these strategies affect the development of absorptive and technological capabilities that are necessary to move from catching-up to forging ahead through innovation?

An important insight of economic development theory is that learning advanced technologies is critical for successful catching-up<sup>53</sup>. The protection of intellectual property rights is a necessary, but by no means sufficient, condition. Detailed case studies of earlier historical experience in the United States, the Scandinavian countries, Japan, Korea, and Taiwan demonstrate that IPR protection can only

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<sup>51</sup> “France Brevets license deal with LG Electronics a “milestone”, says senior fund executive”, IAM, September 1, 2014. The result of FB’s litigation against Taiwan’s HTC is still pending.

<sup>52</sup> Odagiri, H., A. Goto, A. Sunami, and R. R. Nelson, eds. 2010. *Intellectual Property Rights, Development, and Catch-Up*. London: Oxford University Press: chapter 1.

<sup>53</sup> Abramovitz, M., 1989, “Catching up, forging ahead, and falling behind”, chapter 7 in Abramovitz, M., *Thinking about Growth. And Other Essays on Economic Growth and Welfare*, Cambridge University Press, Cambridge etc : p.221.

contribute to economic development if it takes place as part of a multi-faceted innovation strategy that seeks to strengthen absorptive and innovative capabilities of firms, and to develop a broad-based innovation infrastructure (including standards).<sup>54</sup>

Research on latecomer industrialization has identified substantial barriers to entry (“latecomer disadvantages”) which reflect initial limitations in market size and sophistication and in the level of technology<sup>55</sup>. Of particular importance are production-related scale economies, including learning economies, threshold barriers and economies of scope, as well as barriers related to intangible investments required for developing the knowledge and competence base as much as complementary support services.<sup>56</sup>

Empirical research however has shown that none of the above entry barriers are absolute – they can be reduced under certain conditions. Take *economies of scale* which can constrain the entry of latecomers for at least three reasons: the existence of learning economies, the lumpiness of investment and the need to reduce the cost of increasing product variety<sup>57</sup>. In principle, this could be avoided, if the market expanded rapidly, which clearly is the case for the smart phone industry, especially in China and India.

The distinction between “latecomers” and incumbent “leaders” who have accumulated “first-mover advantages” goes back to debates among economic historians on how “relative economic backwardness” in the 19<sup>th</sup> century has shaped the patterns and strategies of industrialization of countries such as Russia, Germany, the US and Japan<sup>58</sup>. It was argued that, under certain conditions, economic advantages are conferred on countries which are latecomers to industrial development. The basic idea is that those who are behind have the potential to make a larger leap. According to a classical study, “the larger the technological and, therefore, the productivity gap between leader and follower, the stronger the follower’s potential for growth in productivity; and, other things being equal, the faster one expects the follower’s growth rate to be. Followers tend to catch up faster if they are initially more backward.”<sup>59</sup> In one of its more sophisticated versions, this argument contends that, since the cost of

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<sup>54</sup> See case study chapters 2–6 in Odagiri et al. 2010. See also Furukawa, Y. 2010. “Intellectual Property Protection and Innovation: An Inverted-U Relationship.” *Economics Letters* 109:99–101.

<sup>55</sup> The following sections draw on Ernst, D. and D. O’Connor, 1992, *Competing in the Electronics Industry. The Experience of Newly Industrialising Economies, Development Centre Studies*, OECD, Paris, 303 pages

<sup>56</sup> Additional latecomer disadvantages include (but are not restricted to) barriers to entry and exit of network transactions, particularly in the context of sourcing arrangements for core components; barriers related to customer relations, including market intelligence, sales channels, and maintenance and repair; and the growing number of regulatory barriers (including standards) which, directly or indirectly, affect the costs of entry. (For details, see Ernst and O’Connor, 1992)

<sup>57</sup> See for instance Bain, J.S., 1959, *Barriers to New Competition*, Harvard University Press, Cambridge, Mass., and Scherer, F.M., 1980, *Industrial Market Structure and Economic Performance*, Houghton Mifflin Company, Boston.

<sup>58</sup> Gerschenkron, A., 1962, *Economic Backwardness in Historical Perspective*, Belknap Press of Harvard University, Cambridge, Mass; Nelson, R.R. and G. Wright, 1992, “The Rise and Fall of America’s Technological Leadership: The Postwar Era in Historical Perspective”, *Journal of Economic Literature*, 30/4: pages 1931 to 1964; and Landes, D., 1965, “Japan and Europe: Contrasts in Industrialization”, in: Lockwood, W.W., ed, *The State and Economic Enterprise in Japan*, Princeton University Press, Princeton.

<sup>59</sup> Abramovitz, M., 1989, “Catching up, forging ahead, and falling behind”, chapter 7 in Abramovitz, M., *Thinking about Growth. And Other Essays on Economic Growth and Welfare*, Cambridge University Press, Cambridge etc : p.221.

changing to each more advanced level of technology progressively increases, latecomers do have a chance of bypassing industrial early starters.<sup>60</sup>

In short, latecomers like China could exploit new opportunities as they are facing fewer legacy constraints to technology development, strategy and organization (“latecomer advantages”). Most importantly, current latecomers could learn from the considerable body of knowledge and experience of catching-up and forging ahead strategies in Japan, Korea, Taiwan and Singapore.

However, does this then imply that **patent-avoiding latecomer strategies** could provide a low-cost and fast pathway to catching-up? And how sustainable would this type of **reverse global strategic patenting strategy** be as a source for a country’s future forging ahead strategies towards market and technology leadership?

A closer look at the Chinese smartphone vendor Xiaomi might provide some tentative answers to these questions. After being valued at more than \$45 billion and raising more than \$ 1 billion in its latest round of funding, Xiaomi has joined Alibaba as the poster child of global investment funds. The stunning success of Xiaomi results from the fact that it sells smartphones for just half the price of the iPhone or Samsung’s Galaxy phones, despite the fact that performance features and services are only slightly below.

For most observers, the key to success is innovative marketing – to lower costs, Xiaomi cut out middlemen and distributors, selling only directly through its website. In addition, Xiaomi keeps each model on the market for two years - far longer than Apple does<sup>61</sup>. As component costs drop over the two-year period by more than 90%, Xiaomi maintains its original price, and pockets the difference. This allows Xiaomi to use leading-edge components from Qualcomm, Nvidia, Broadcom, and it outsources production to Foxconn, Apple’s preferred contract manufacturer.

It is important however to emphasize that much of Xiaomi’s success depends on the critical role played by a **new form of strategic patenting** that could destroy the value of patents not just in China but around the world<sup>62</sup>. The real story, in a nutshell, centers on **Xiaomi’s close links with the US smartphone chip vendor Qualcomm**. Not only has Xiaomi received substantial equity investment from Qualcomm<sup>63</sup>, but Xiaomi’s smartphones use Qualcomm chips. Of critical importance is **Qualcomm’s cross-licensing model in China** which prevents patent fights from breaking out among Qualcomm’s Chinese customers.

According to industry sources who request anonymity, Qualcomm’s Chinese customers are required to hand over their patents to Qualcomm in exchange for gaining access to Qualcomm’s technology. Thanks to these special provisions in Qualcomm’s “cross-licensing model” in China, Qualcomm’s Chinese clients can use each other’s patents without worrying about legal consequences. Qualcomm has argued that its

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<sup>60</sup> Ames, E. and Rosenberg, N., 1963, “Changing Technological Leadership and Industrial Growth”, *Economic Journal*, vol. 73, pp. 13-31, March

<sup>61</sup> Sampere, J.P.V., 2014, “Xiaomi, not Apple is changing the Smartphone Industry”, *Harvard Business Review*, October 14, <https://hbr.org/2014/10/xiaomi-not-apple-is-changing-the-smartphone-industry/>

<sup>62</sup> As predicted in Stevenson-Yang, A. and K. DeWoskin, 2005, “China Destroys the IP Paradigm”, *Far Eastern Economic Review*, 168, no.3: 9-18. That article focuses on the impact of reverse engineering of foreign technology, forced tech transfer and IP theft, but does not address explicitly strategic patenting.

<sup>63</sup> <https://qualcommventures.com/team-member/james-shen/>

licensing strategy, under which patents are grouped together in blanket deals, benefits the industry by protecting customers from infringement suits.

This arrangement clearly benefits companies like Xiaomi which have avoided investing in building up a broad patent portfolio. For instance, Xiaomi has filed at most 1,600 patent applications (most of which were filed in the last two years). But a mere 124 patents have been granted, with only 13 of those are inventions (the rest are design and utility model patents)<sup>64</sup>. In comparison, Apple Inc. has been granted 1,149 patents in China, about half of which are inventions. Samsung Electronics has been granted 11,877 invention patents in China. And China's first-generation smart phone vendors Huawei and ZTE both have strong patent portfolios –Huawei has almost 30,000 mobile phone patents (with 7,000 registered in 2014 alone), and ZTE has more than 13,000 mobile phone patents. Both Chinese companies complain about “unfair” treatment as a result of Qualcomm’s “cross-licensing model”.

Yet, Xiaomi’s **patent-avoiding latecomer strategy** may now be reaching its limits, at least in its reliance on Qualcomm’s “cross-licensing model”. Already in December 2014, *Bloomberg Business* reported that China’s National Development and Reform Commission (NDRC) wants to end Qualcomm’s practice of forcing clients into cross-licensing deals that curb royalty payments from other Qualcomm customers<sup>65</sup>. And on February 9, 2015, a year-long anti-trust probe by Chinese authorities against Qualcomm has come to an end, as NDRC and Qualcomm have reached a resolution<sup>66</sup>.

NDRC had accused Qualcomm in 2013 of abusing its dominant market position by charging unfair licensing conditions. Industry observers estimate that Qualcomm accounted for about 60% of China’s market for mobile phone chips and that Qualcomm has charged the highest royalty rates in the smart phone industry – at 5% of the whole sale price of a handset<sup>67</sup>. According to the agreement between NDRC and Qualcomm, the headline royalty rates of 5% for 3G devices and 3.5% for 4G devices remain roughly unchanged, but in each case, the royalty base would now fall from 100% to 65% of the net selling price of the smartphone.<sup>68</sup> As a result, the producer of a 4G-capable smartphone, for example, will now pay Qualcomm no more than 2.28% of the handset’s wholesale price, down from the 3.5% rate Qualcomm previously demanded.

As for Qualcomm’s cross-licensing approach, Qualcomm agreed to allow companies with larger patent portfolios (like Huawei, ZTE and Lenovo) to “offset” those larger patent portfolios against Qualcomm’s charges<sup>69</sup>. Specifically the agreement stipulates:

*“Qualcomm will not condition the sale of baseband chips on the chip customer signing a license agreement with terms that the NDRC found to be unreasonable or on the chip customer not*

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<sup>64</sup> <http://english.sipo.gov.cn/>

<sup>65</sup> “China Said to Push Qualcomm to Lower Patent Fees for Phonemakers”, 23 December 2014, <http://www.bloomberg.com/news/articles/2014-12-23/china-said-to-push-qualcomm-to-lower-patent-fees-for-phonemakers>

<sup>66</sup> <https://www.qualcomm.com/news/releases/2015/02/09/qualcomm-and-chinas-national-development-and-reform-commission-reach> . See also “NDRC and Qualcomm Reach Resolution of Antimonopoly Law Complaint”, <http://chinaipr.com/2015/02/10/ndrc-and-qualcomm-reach-resolution-of-antimonopoly-law-complaint/> .

<sup>67</sup> Quoted in Clover, C., 2015, “Qualcomm chipped, but not broken”, FT, February 11:p.15

<sup>68</sup> “NDRC and Qualcomm Reach Resolution of Antimonopoly Law Complaint”.

<http://chinaipr.com/2015/02/10/ndrc-and-qualcomm-reach-resolution-of-antimonopoly-law-complaint/> .

<sup>69</sup> Qualcomm president Derek Aberle, quoted in Clover, C., 2015, “Qualcomm chipped, but not broken”, FT, February 11:p.15

*challenging unreasonable terms in its license agreement. However, this does not require Qualcomm to sell chips to any entity that is not a Qualcomm licensee, and does not apply to a chip customer that refuses to report its sales of licensed devices as required by its patent license agreement.*<sup>70</sup>

Chinese owners of large patent portfolios, like Huawei, ZTE and Lenovo, may benefit from this agreement. However their immediate response was one of disappointment, arguing that NDRC should have forced greater changes to Qualcomm's licensing procedures.

In any case, there is little doubt that the NDRC-Qualcomm resolution will leave Xiaomi exposed to potential legal challenges from large foreign patent owners, as well as its Chinese competitors<sup>71</sup>. Once Xiaomi will have to pay licensing fees, this will substantially raise its cost burden, and further compress its already quite low profit margins, estimated to be around 1.8% at present. This raises the question, whether the afore-mentioned massive capital injection by foreign investors will allow Xiaomi to force its way out of the patent trap, for instance, through massive investments in existing patent portfolios, with the help of patent monetization companies and aggregators.<sup>72</sup>

While **patent-avoiding latecomer strategies** *a la* Xiaomi are facing significant challenges, it is unlikely that this will be the end of the story. As one industry observer who requests anonymity, puts it: "Xiaomi has Qualcomm equity investment – so probably it will work something out no matter what." In other words, adjustments are likely to be made in the original model, and new players may come up with new versions of **latecomer strategic patenting** in order to bypass the constraints of the existing global patent system.

In short, future research needs to trace emerging mutations of such **patent-avoiding latecomer strategies** and their impact on the international distribution of innovation gains. It is no longer realistic to assume that **global strategic patenting** will remain an exclusive playground for industry leaders from the US, the EU and Japan.

### **Questions for policy and further research**

This paper has reviewed what we know about the increasing variety and global reach of strategic patenting, and how patents are used as a strategic weapon to shape markets and to reap monopoly rents through patent monetization. What we don't know but need to know is how these changes in the patent system affect the international distribution of innovation gains from patents. Specifically, what do these changes imply for latecomers in the global knowledge economy, in particular for young companies with new ideas? And how does the proliferation of strategic patenting affect the development of innovation capabilities in emerging economies, as well as middle-income countries and developing countries?

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<sup>70</sup> Quoted in "NDRC and Qualcomm Reach Resolution of Antimonopoly Law Complaint", <http://chinaipr.com/2015/02/10/ndrc-and-qualcomm-reach-resolution-of-antimonopoly-law-complaint/>.

<sup>71</sup> In December 2014, Ericsson successfully litigated Xiaomi in India, a critical market for Xiaomi's planned overseas expansion. And rumors are ripe that Huawei and ZTE are preparing litigation in China, and that Apple sooner or later will follow suit.

<sup>72</sup> Xiaomi's current response is to diversify into own-brand name air purifiers and wearable devices. But as long as Xiaomi does not expand its patent portfolio, there is reason to doubt whether the move into global branding will succeed. The rise and fall of China's sportswear company Li-Ning, one of China's best-known brands, indicates possible limitations of a premature leap into global branding *without* a robust patent portfolio. (Waldmeier, P., 2015, "Great Leap Backwards at Li-Ning", *Financial Times*, January 24:p.10)

### Questions for policy

1. What changes are required in patent law and regulations, and in patent court practice to reduce the use of patents as market deterrents and as a new asset class?
2. How important are adjustments in complementary policies, especially competition policy and tax policy?
3. Despite efforts to increase the harmonization of patent systems, national patent systems and policies continue to vary across countries, reflecting differences in the stage of development, in economic structure and institutions. Should the international patent system remain in a “multispeed” mode for the foreseeable future to reflect these differences? Or should serious efforts be made to “normalize differences in patent laws and regulations across countries, in order to reduce the uncertainty due to the current balkanized approach to measuring patent quality<sup>73</sup>?
4. What changes in the governance and procedures of standard development organizations and private standards consortia would help to reduce the use of standard-essential patents (SEPs) as entry deterrents? Specifically, how will the recent IEEE policy amendments affect the implementation of “fair, reasonable and nondiscriminatory (FRAND) licensing terms, and will other standard-setting organizations like for instance the European Telecommunications Standards Institute (ETSI) follow suit?
5. What adjustments in regulations and incentives are needed to reduce aggressive patent infringement litigation?
6. What policy instruments would help to redirect the providers of patent monetization services away from destructive litigation races to acting as intermediaries that could facilitate the international diffusion of patent-related capabilities?
7. What type of policies (if any) could improve the currently dismal impact of patent licensing on the development of new products or services, and on the transfer of technology and personnel through consulting arrangements or joint ventures?
8. Both in the US and the UK, the tax code favors income generating from rising asset values, such as increase in share prices or in patent valuation<sup>74</sup>. What changes in tax law and competition law would be needed to reduce the use of patents as new asset classes?
9. What are realistic options for Patent Law solutions to tax avoidance that could slow-down the use of cross-border licensing as a tool for corporate transfer pricing and tax planning?
10. What institutional arrangements are needed to disseminate relevant patent-related capabilities to young companies with new ideas who at present lack those capabilities? And what institutional arrangements are needed to disseminate relevant patent-related capabilities to emerging economies, as well as middle-income countries and developing countries?
11. Under what conditions could Sovereign Patent Funds (SPFs) act as a legitimate defense against the damage caused by “Patent flight “as witnessed in Canada (Nortel; RIM) and Finland (Nokia), by salvaging patents and portfolios when companies with rich patent portfolios go bankrupt?
12. Under what conditions could Sovereign Patent Funds (SPFs) improve the distribution of innovation gains, by helping to improve the capacity of smaller firms to assess the value of their patents and monetize them through the creation of licensing programs?

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<sup>73</sup> As argued in Kappos, D.J. and S. Graham, 2012, “The Case for Standard Measures of Patent Quality”, *MIT Sloan Management Review*, Spring; 6 pages, <http://sloanreview.mit.edu/article/the-case-for-standard-measures-of-patent-quality/>

<sup>74</sup> Americans pay a top rate of 23.8% tax on their investment income (apart from numerous exemptions they can claim), a rate that is significantly lower than the top rate of tax on income from employment, which stands at 39.6%. (See for instance, <http://www.irs.gov/taxtopics/tc559.html> )

13. What national and international institutional arrangements could help to reduce the incentives for patent-avoiding latecomer strategies and their negative effects on the diffusion of innovation capabilities?

### Questions for further research

1. The proliferation of global networks of production (GPNs) and innovation (GINs) raises an important question for the international political economy of patent systems: *How do the proliferation and the increasing diversity of these global network arrangements affect the patent strategy of business and national governments and consequently affect the international diffusion of technology and innovation capabilities?*

Specific questions:

1.1. Who controls IPR in global production networks (GPNs)?

- Network flagships
- Specialized network suppliers (Tier-1 , Tier-2, Tier-3 and lower)
- External corporate technology suppliers
- Universities and public research institutes
- Patent pools
- Sovereign Patent Funds
- Owners of Standard-essential patents (SEPs)?
- Patent Monetization companies?

1.2. Who appropriates the rents from distributed R&D through global innovation networks GINs ?

- Network flagships
- Specialized network suppliers (Tier-1 , Tier-2, Tier-3 and lower)
- External corporate technology suppliers
- Universities and public research institutes
- Patent pools
- Sovereign Patent Funds
- Owners of Standard-essential patents (SEPs)?
- Patent Monetization companies?

2. How can we measure the **increasing diversity and complexity of global innovation networks (GINs)?**

GINs now involve multiple actors and firms that differ substantially in size, business model, market power, and nationality of ownership, giving rise to a variety of networking strategies and network architectures.

## 2. Global innovation networks – increasing diversity

### Hierarchical

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- **Intra-firm networks** - Global companies “offshore” stages of innovation to Asian affiliates
- **Inter-firm networks** - Global firms “outsource” stages of innovation to specialized Asian suppliers
- **Asian firms** construct their own GINs (**Huawei**)
- **International public-private R&D consortia**
- **ITRI** – global knowledge sourcing from the erstwhile periphery
- **From hierarchical to splintered GINs**
- **Foxconn** – contractors can shape strategic direction as junior network flagships

**Informal social networks (students, knowledge workers)**

Plus:

Adapted from Ernst, D., 2009, *A New Geography of Knowledge?*

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3. Will the recent IEEE policy amendments on FRAND licensing terms, which are backed by DoJ, Intel, IBM, succeed in reducing some of the notorious ambiguities (RAND, injunctions, etc.)? And how effective will large patent portfolio owners (like QUALCOMM and Ericsson) be in their efforts to block this IEEE policy initiative?
4. Under what conditions could latecomers (companies in emerging, middle income and developing countries) use Sovereign Patent Funds to appropriate at least some of the rents from distributed R&D through global innovation networks GINs?
5. Under what conditions could latecomers (companies in emerging, middle income and developing countries) use patent-avoiding latecomer strategies, at least during the catching-up phase?
6. What is the impact of **plurilateral** trade agreements (like the current negotiations on expanding the Information technology Agreement (ITA-2) on the use of strategic patenting? And how will this affect the international distribution of innovation gains?
7. What is the impact of **mega-regional** trade agreements, like the Trans-Pacific Partnership Agreement (TPP) and the Transatlantic Trade and Investment Agreement (TTIA), on the use of strategic patenting? And how will this affect the international distribution of innovation gains?
8. What types of strategic patenting strategies might emerging economies like China use to foster their industrial upgrading-through-innovation? And what are the negative and often unexpected side effects of such patent strategies?