
**Global Strategic Patenting and
Innovation -
Policy and Research Implications**
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Argument

- The relationship between patents & innovation is much more complex than acknowledged in much of the current innovation policy rhetoric.
- As an **exclusionary** property right, patents are used as a **strategic weapon** to shape markets & 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.

Storyline

1. Has the global patent surge flattened the geography of innovation?
2. How does strategic patenting transform innovation? (SEPs; litigation/smart phone wars; patent monetization; patent-related transfer pricing & tax planning)
3. Emerging challenges (Sovereign Patent Funds; patent-avoiding latecomer strategies)
4. Questions for policy & further research

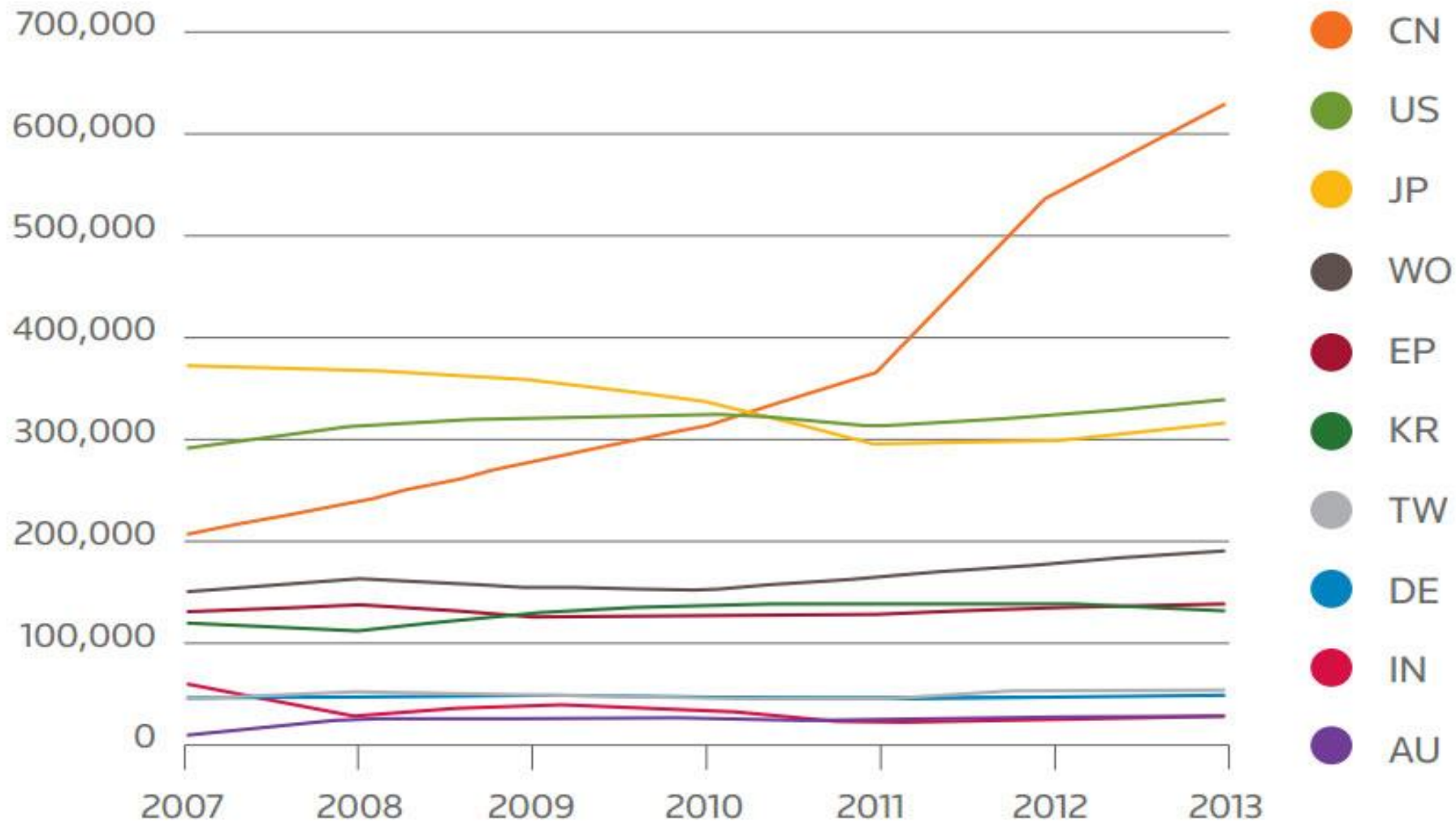
1. Has the global patent surge flattened the geography of innovation?

- Patent filings worldwide surged from ca 1m (1995) to > 2.57 m (2013)
- Internationalization of patenting is the main driver of the patent surge → The share of inventions being patented in more than one country (*subsequent filings*) increased from 39% (1983-1990) to 52% (1995-2007)
- This has dispersed innovation gains, yet in a highly concentrated manner (**concentrated dispersion of innovation gains**)

China's patent boom - the most important shift in the international patent system

- Since 2011, more patents are filed at China's patent office (SIPO) than at any other office in the 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%.
- China is catching up, but still has a long way to go...

INVENTION PATENT APPLICATIONS 2007-2013



Source: Derwent World Patents Index® and Thomson Innovation®

Does China's patent boom signal a reduction of China's innovation gap?

- In 2013, China not only passed, but dwarfed the US and Japan in total patent applications
- Domestic patent applications have overtaken foreign applications since 2003 → Chinese nationals account for $\frac{3}{4}$ of total patent applications with SIPO
- BUT: $\frac{3}{4}$ of resident applications with SIPO in 2011 were for lower-quality “Utility Model” (UMP) & Design Patents .
- This is now changing, albeit slowly: In 2013, resident applications for UMP and Design patents decline significantly ← Government has reduced subsidies for UMP & Design Patent applications.

China's strengths

Innovation push: Massive investments in the country's R&D infrastructure & higher education have been fast-tracking the speed of learning & capability development. → Since 2000, China has increased R&D spending roughly 10% each year.

High GPN integration: Two-thirds of China's production of goods & services are intermediates, which is substantially higher than the world average*

High GIN integration: China is the largest “net importer” of R&D, and it is the third most important offshore R&D location (after the US and UK) of the 300 top R&D spending multinationals**.

*Baldwin and Lopez-Gonzales 2013 ** Ernst, 2011 Testimony to US-China Economic & Security Commission

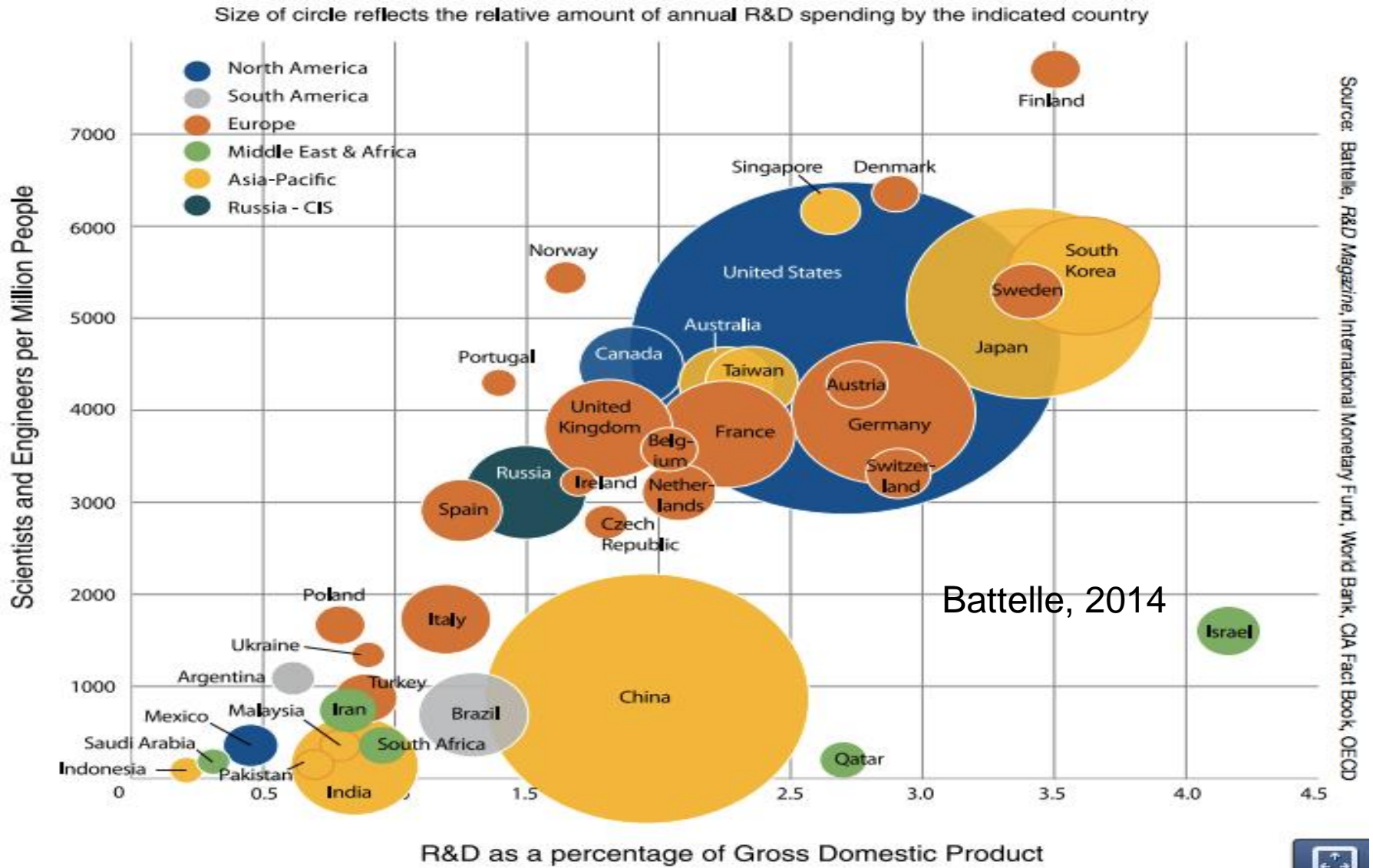
Beijing Genomics Institute (BGI) – a new technology platform leadership strategy?

- Use > 150 imported state-of-the-art sequencing machines to build a huge library based on the DNA of many millions of people
- Use this library as a springboard for new drug discoveries, advanced genetic research and a transformation of public health policy
- Use venture capital funding from Gates Foundation, Sequoia Capital, etc. instead of Government funding

China's domestic innovation barriers reflect its latecomer status

- Fragmented innovation system → inter-agency rivalries
- Quality problems in education; plagiarism in science & derivative research
- Top-down technology leapfrogging that neglects risks of ramping-up complex technology systems in record time
- Public R&D support and procurement privileges SOEs & neglects SMEs
- IPR regime remains weak, despite improvements → disincentives for innovation
- Lists of “indigenous innovation” products used for government procurement focus on *existing* technologies and hence stifle innovation
- Weak complementary capabilities (legal; patent law; standardization; coordination of complex innovation networks; “integrated solutions”; advanced manufacturing)

World of R&D 2013



Established innovation centers retain dominance

- all 15 leading companies with the best record on patent citations are based in the United States (9 in the IT industry)
- The 700 largest R&D spenders (mostly large U.S. firms) account for 50% of the world's total R&D expenditures and $>2/3$ of the world's business R&D
- > 80 percent of the 700 largest R&D spenders come from only five countries (United States dominates, followed by Japan, Germany, United Kingdom, France)

2. How does strategic patenting transform innovation?

A patent is a **negative right**, granted by the US government to an inventor

*“to **exclude** others from making, using, offering for sale, or selling the invention throughout the US or importing the invention into the US for a limited time in exchange for public disclosure of the invention when the patent is granted.”*

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

Patents ...

“....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.” (Brian Kahin, 2009)

Strategic patenting: Patents can be used as a strategic weapon to ...

- increase monopoly rents thru patent monetization (patents as a new asset class)
- shape markets thru entry deterrents → to prevent a competitor not only from making the same product, but also from playing in the same market space.
 - The competitor must innovate around the existing patent which is more expensive.
 - To avoid infringement, the competitor must make a product that does not hold the comparable consumer acceptance.

Strategic patenting – Who does it?

- Not only patent trolls (NPEs), the system's modern villain.

But also ...

- product-producing companies with large patent portfolios (Qualcomm; Ericsson)
- providers of patent monetization services (Intellectual Ventures; IPNav; RPX Research; RuiZhi Ventures; Transpacific IP; etc)
- Universities and public research institutes
- [Sovereign patent funds]

Current forms of strategic patenting

- 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 (TPEs or trolls);
- the use of cross-border patent licensing as a tool for corporate transfer pricing and tax planning

Standard-essential patents (SEPs) are...

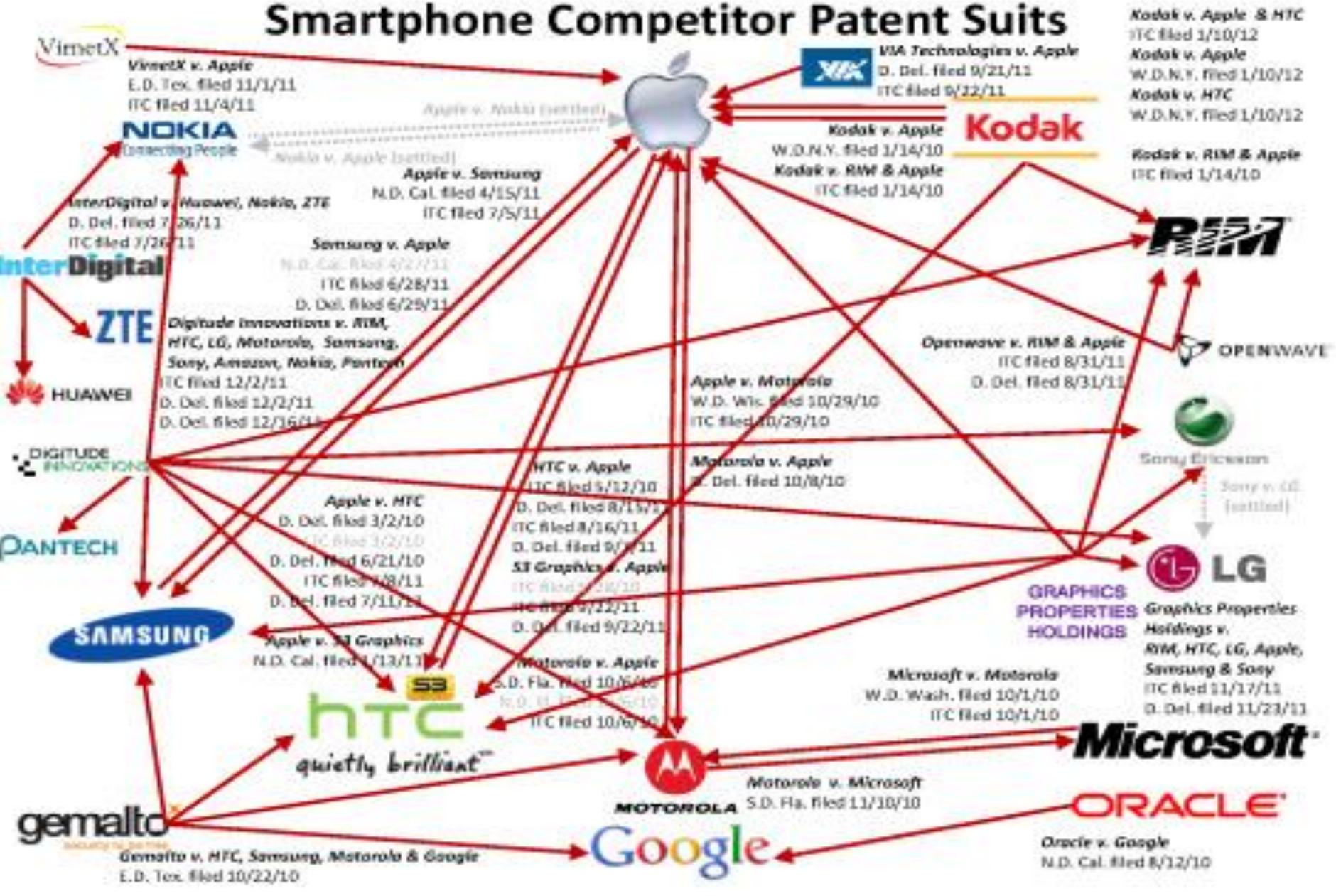
- necessary to produce any product that meets the specifications defined in the standard → Patents are “essential” to a standard when it is not possible to comply with the standard without infringing that intellectual property right.
- used as a strategic weapon to prohibit, delay, or obstruct standardization processes (Blind et al, 2004)
- Challenge: finding fair and reasonable nondiscriminatory (FRAND) licensing terms
- A glimmer of hope? IEEE commits members to license patents to users of IEEE standards on FRAND terms*
- But: fierce resistance by owners of large patent portfolios
- (Qualcomm; Ericsson)

*Contreras, J.L., 2015, IEEE Amends its Patent (FRAND) Policy

Aggressive infringement litigation – smartphone patent wars

- 2009: Nokia sues Apple over 10 patents, while Apple countersues Nokia over 13 patents.
- Since 2011: Apple leads development of increasingly aggressive forms of patent infringement litigation:
“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.” (WIPO, 2012, *The Impact of the Acquisition and Use of Patents on the Smartphone Industry*)

Smartphone Competitor Patent Suits



Patent monetization services rarely promote innovation

= “entities whose primary focus is deriving income from licensing and litigation, as opposed to making products”*

- “... 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 total cost to industry to resolve patent litigation by trolls add up to \$ 13 billion during 2014.
- Licensing as a result of a patent request or lawsuit rarely, if ever, resulted in new products and services, technology transfer, transfer of personnel or consulting arrangements, or joint ventures**.

* Jeruss, S., R. Feldman & J. Walker, 2012, “The American Invents Act 500: Effects of Patent Monetization Entities on US Litigation”; ** Feldman, Robin and Lemley, Mark A., “Does Patent Licensing Mean Innovation?” (February 15, 2015)

MNCs use cross-border patent licensing as a tool for transfer pricing & tax planning

Patents are licensed to tax havens for artificially low prices:

- This profit shifting reduces the tax bill of US-owned companies by ca 20% → US Treasury is estimated to lose ca \$ 90 billion each year*.

We don't know, but need to find out thru case studies:

- “How and how much are cross-border IP licensing used for income shifting by MNCs and NPEs [trolls] for tax planning/avoidance and what is the role of different tax regimes like territorial taxation?” ** © Dieter Ernst, EWC

*Zucman, G., 2014, “Taxing across Borders

** Granstrand, O., 2014, Suggestions for further research on the Patent system

3. Emerging challenges - Sovereign Patent Funds

- Sovereign Patent Funds (SPFs)
- Patent-avoiding latecomer strategies, with China's Xiaomi as the most prominent example.

Sovereign Patent Funds (SPFs)

Governments (France, Korea, Japan, Taiwan, China) are now seeking to emulate corporate strategic patenting strategies to ...

- strengthen patent management capabilities, especially of SMEs
- monetize domestic patents through licensing or litigation
- protect domestic companies against patent litigation from foreign companies

Constraints

- US Gov is hostile → SPFs are “state-sponsored patent trolls”
- France, Korea and Japan have clear focus ↔ Tw & China are still searching for a viable business model.

Are patent-avoiding latecomer strategies a low-cost & fast pathway to catching-up for Chinese firms?

Xiaomi sells smartphones in China for half the price of the iPhone → Xiaomi leads in China market with 39% (up from 11% in Q1 2014)

Xiaomi's meteoric rise reflects innovative marketing. But it critically depends on Qualcomm's **cross-licensing model in China**

- QC's Chinese customers are required to hand over their patents to QC in exchange for gaining access to QC's technology. → QC's Chinese clients thus can use each other's patents without worrying about legal consequences.
 - Xiaomi benefits by avoiding investing in R&D and patenting
- **Only 13 Xiaomi invention patents have been granted**

Apple has 1,149 invention patents in China, Samsung Electronics has 11,877 © Dieter Ernst, EWC

The Xiaomi/Qualcomm model is reaching its limits

- QC charges the highest royalty rates in the smart phone industry (5% of the whole sale price)
- accounts for 60% of China market for mobile phone chips.

2/9/2015: A year-long antitrust probe by NDRC against QC resulted in a \$975m fine for abusive patent licensing practices and imposed substantial reduction in licensing fees.

→The NDRC/QC resolution reduces the protection provided by QC's cross-licensing agreement to Xiaomi, exposing it now to legal challenges from large patent owners, such as Ericsson, but also Huawei, ZTE & Lenovo.

This is unlikely to be the end of patent-avoiding latecomer strategies

- “Xiaomi has Qualcomm equity investment – so probably it will work something out no matter what.” (anonymous industry observer)
- 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.
- 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.

4. Questions for policy & further research

How does the increasing variety and global reach of strategic patenting affect the international distribution of innovation capabilities ...

- in particular for young companies with new ideas?
- in emerging economies, as well as middle-income countries and developing countries?

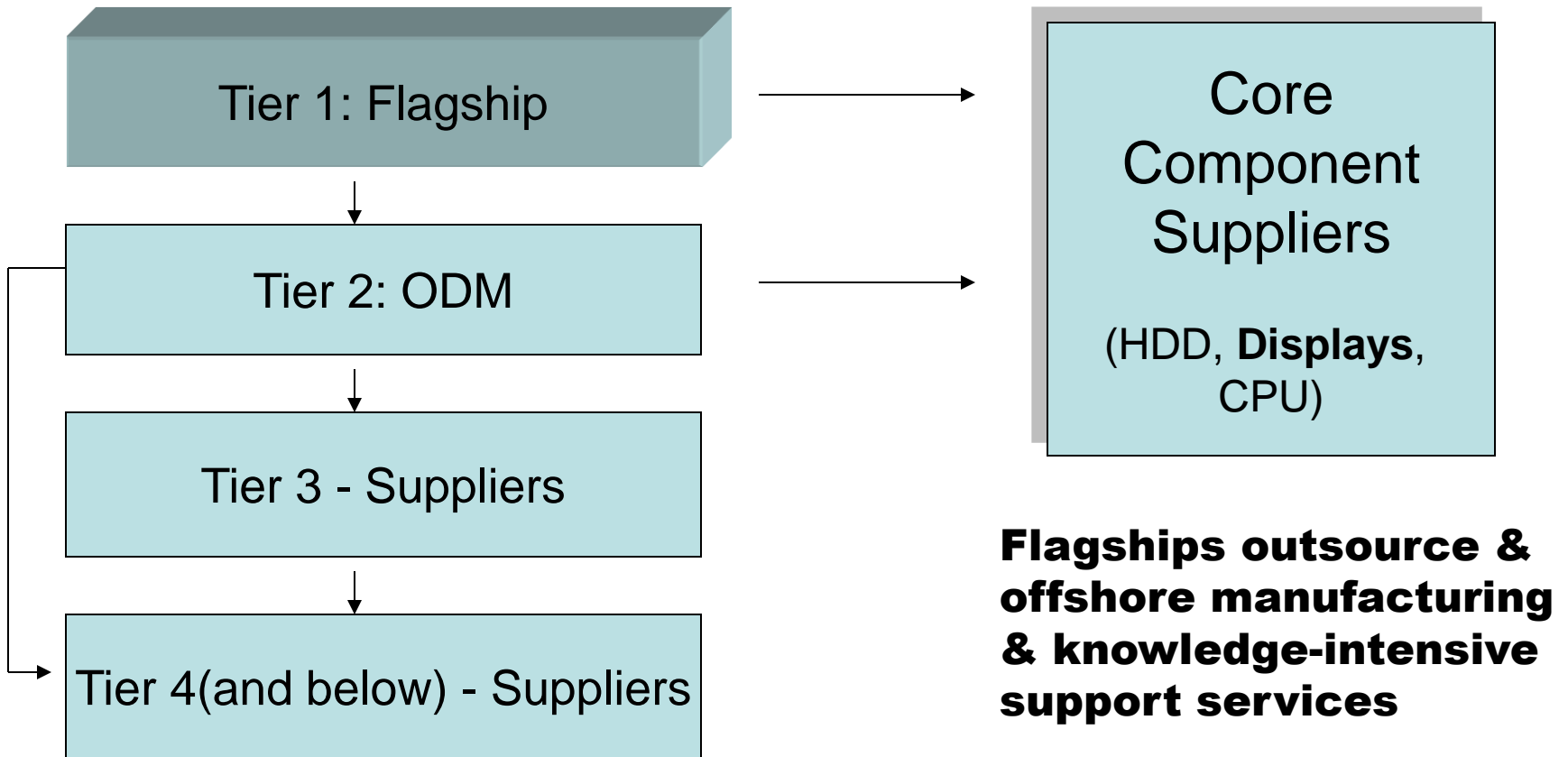
Questions for policy

1. To reduce the use of patents as market deterrents and as a new asset class, **what changes are required** in patent law & regulations, in patent court practice, as well as in competition, tax & trade policies?
2. **To harmonize or not to harmonize?** Should the international patent system remain in a “multispeed” mode for the foreseeable future to reflect the differences in national patent systems and policies?
3. Under what conditions could Sovereign Patent Funds (SPFs) act as a **legitimate defense** against the damage caused by “Patent flight “(Canada: Nortel; RIM) & Finland (Nokia), when companies with rich patent portfolios exit? Could SPFs improve the patent-related capabilities of SMEs?

Questions for research

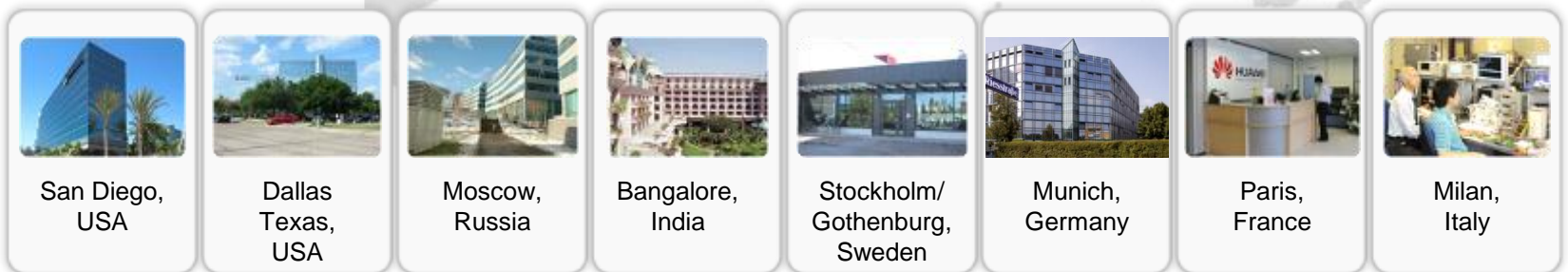
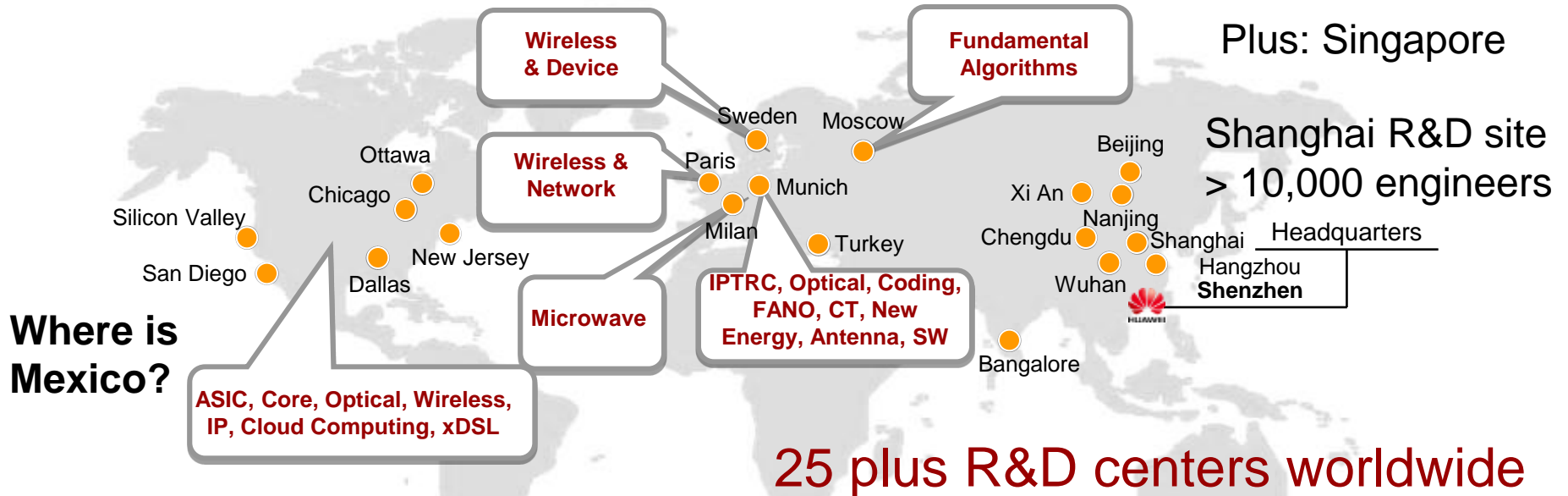
1. Who controls IPR in global production networks (GPNs)?
2. Who appropriates the rents from distributed R&D through global innovation networks/GINs?
 - Network flagships
 - Specialized network suppliers (Tier-1 , Tier-2, Tier-3 and lower)
 - External corporate technology suppliers
 - Universities and public research institutes
 - Patent pools
 - Sovereign Patent Funds
 - Owners of Standard-essential patents (SEPs)?
 - Patent Monetization companies?

Inter-Firm Networks - Notebooks



Huawei's Global Innovation Network

Plus: Belgium (close to IMEC); Ireland (software) & Finland (mobile devices)



> 800 R&D specialists across 14 R&D sites in 8 EU countries

Sources: company website and interviews

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Trade & innovation – What is the impact of ...

1. **plurilateral** trade agreements (ITA-2; TISA; WTO-GPA) on the use of strategic patenting? And how will this affect the international distribution of innovation gains?
2. **mega-regional** trade agreements, like the Trans-Pacific Partnership Agreement (TPP) and the Transatlantic Trade and Investment Agreement (TTIA)?

What role for China and other emerging economies?

1. What types of strategic patenting strategies might emerging economies like China use to foster their industrial upgrading-through-innovation?
2. And what are the negative and often unexpected side effects of such patent strategies?
3. How will this affect the capacity of industry leaders from the US, the EU and Japan to pursue global strategic patenting strategies?

Q&A