Intellectual Property and Development

Center for the Protection of Intellectual Property

***Fourth Annual Fall Conference*-Intellectual Property & Global Prosperity**

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A Modest Proposal

(a) IP Rights facilitate and encourage *innovation*; and

(b) *Innovation* drives *development*

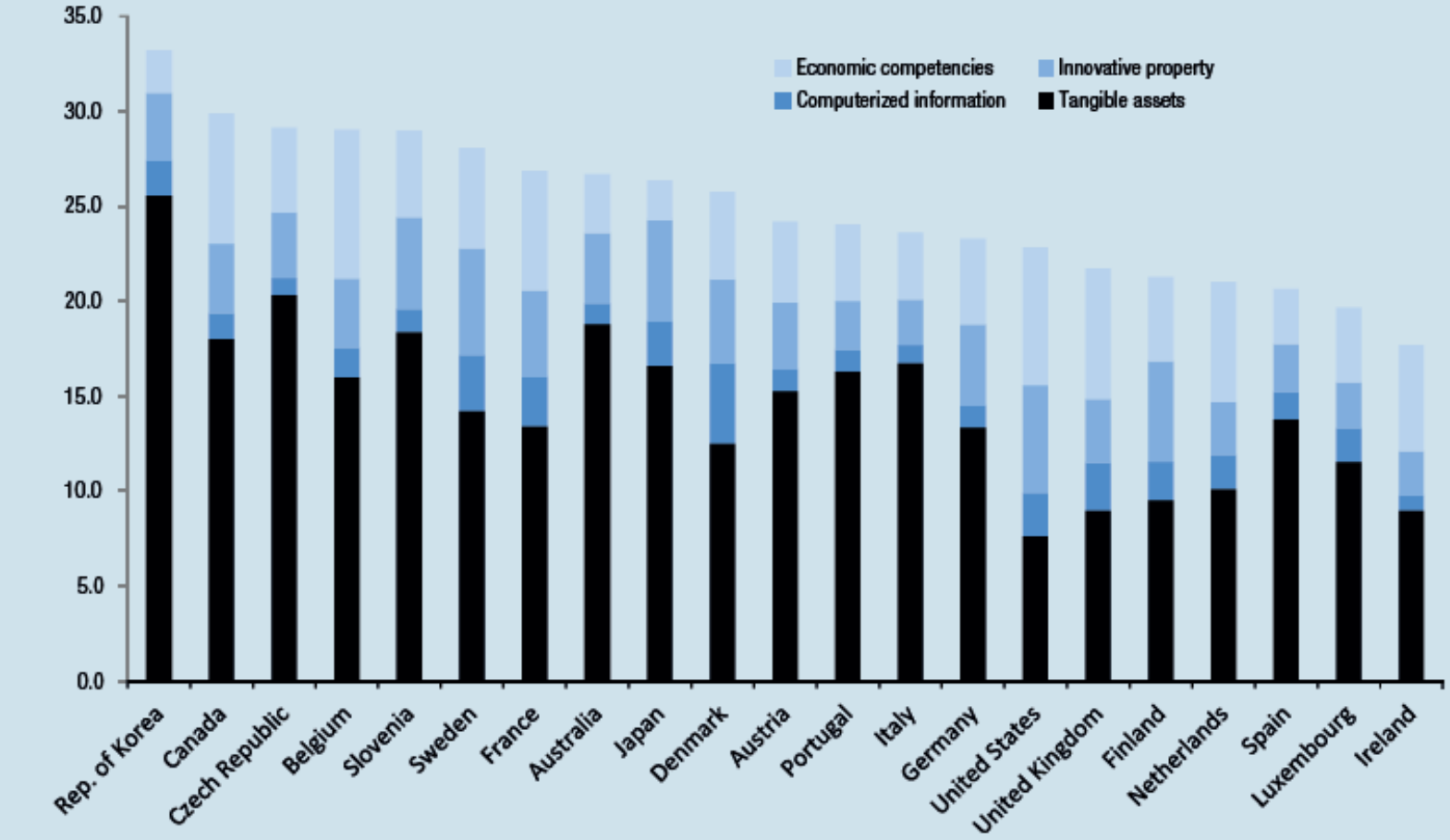
(Economic, quality of life… societal benefits)

therefore

(c) IP Rights drive development.

- To the extent that (a) and (b) hold true, (c) follows.
  - However, there are nuances to premises (a) & (b).

Figure 1.6: Intangible asset investments account for substantial shares of total business investment



Note: For Canada, Japan and the Republic of Korea estimates refer to 2008.

Source: OECD (2013), figure 1.28.

World IP Report 2015 – Breakthrough Innovation and Economic Growth
http://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2015.pdf

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Premise (a): What is Innovation?

- Development of

  new concepts

  into

  new processes, products or know-how

  with

  implementation, exploitation, commercialization
- Not synonymous with *intellectual property* (IP)
  - But IP is important
- Fruitful innovation is *deliberately planned*
  - At both national (policy) level and business level

Premise (a): Patents as Drivers of Innovation

- "Patents aim to foster innovation in the private sector by allowing inventors to profit from their inventions."
- Patents as an incentive mechanism
  - "Empirical evidence tends to support the effectiveness of patents in encouraging innovation," depending upon the *technical subject matter* and *context*
  - "*Too broad a protection on basic inventions can discourage follow-on inventors*" if licensing is withheld

OECD, *Patents and Innovation: Trends and Policy Challenges* (2004)
https://www.oecd.org/sti/sci-tech/24508541.pdf

Premise (a): Patents as Drivers of Innovation

- IP rights can "have differential effects on countries at different stages of economic development."
- *Patent protection "is an important determinant of innovation* and … patentable innovations contribute to economic growth in developed countries, *but not in developing*."

Kim, Lee, Park & Choo, *Appropriate intellectual property protection and economic growth in countries at different levels of development* (2011) http://new.american.edu/cas/faculty/wgpark/upload/Intellectual-Property-Rights.pdf, *citing*

Fink & Maskus, *Intellectual Property and Development* (2005), http://siteresources.worldbank.org/INTRANETTRADE/Resources/Pubs/IPRs-book.pdf

Premise (a): Patents as Drivers of Innovation

- “[T]here is a causal relationship between the strength of patent rights and innovation.”
- “Stronger patent rights positively impact innovation once a society has already reached some critical level of economic development.”

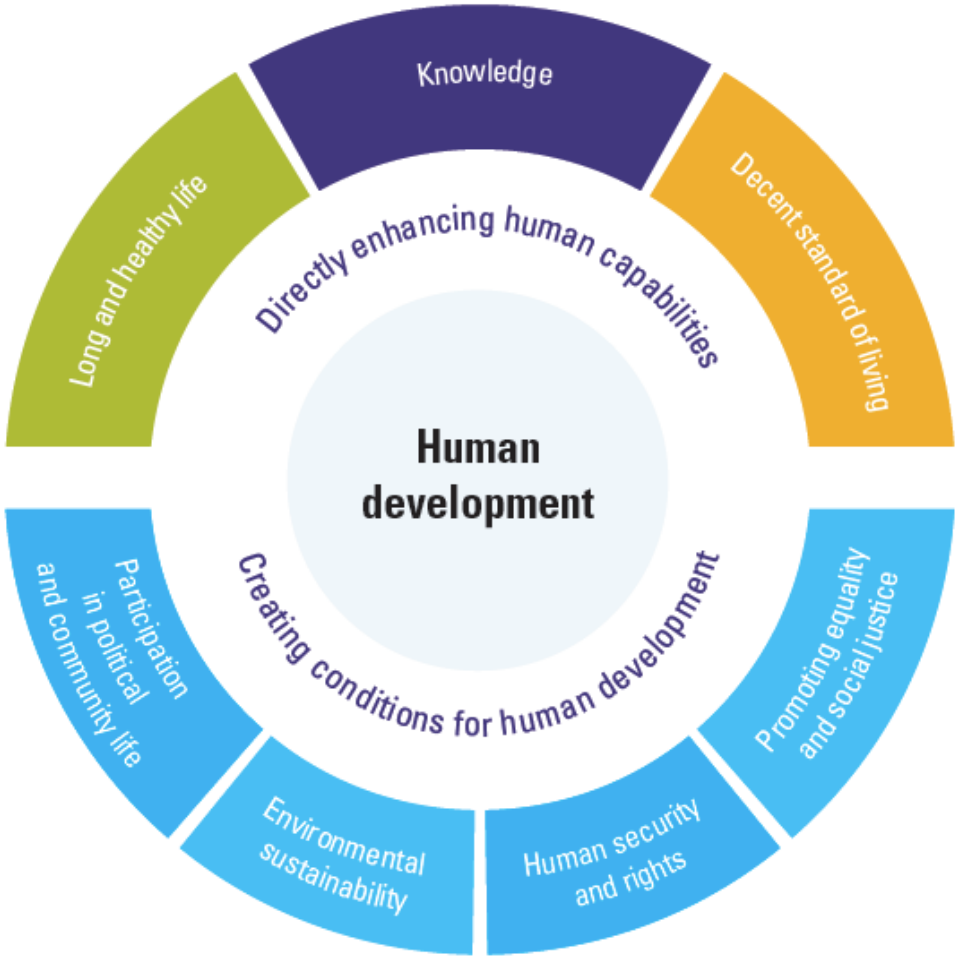
Haber, S., *Patents and the Wealth of Nations*, George Mason Law Review 23:4, p.19 (2016)

https://a1papers.ssrn.com/sol3/papers.cfm?abstract_id=2776773

Premise (b): What is Development?

- Economic growth
- Human Development[1]
  - Life expectancy
  - Adult literacy
  - Access to all levels of education
  - Sufficient income (necessary to freedom of choice)
  - Health status
  - Political freedom
- "Human development is the end – economic growth a means."[2]

[1] World Bank, *Beyond Economic Growth–An Introduction to Sustainable Development*
http://www.worldbank.org/depweb/english/beyond/beyondco/beg_all.pdf
[2] United Nations Development Programme, *Development Report 1996*
http://hdr.undp.org/sites/default/files/reports/257/hdr_1996_en_complete_nostats.pdf



"Human development is about enlarging human choices - focusing on the richness of human lives rather than simply the richness of economies…. People are the real wealth of nations."

United Nations Development Programme, *Development Report 2016*
http://hdr.undp.org/sites/default/files/reports/257/hdr_1996_en_complete_nostats.pdf

IP Policy Elements Supporting Innovation

- Providing access to information
  - Technical information
  - Legal advice
    - Small business advice, Chambers of Commerce
  - Patent information
    - E.g. PATENTSCOPE (https://patentscope.wipo.int))
    - National IP office search sites
- Financial support
  - Investment environment
  - Reduced fees for small enterprises
- Strong patent system
- Encouraging investment in R&D

Innovation Policy Instruments

- Publicly Funded and Executed
  - Public research organizations
  - Academic research
- Publicly Funded and Privately Executed
  - Government procurement
  - Research subsidies and direct government funding
  - Prizes
  - Soft loans
  - R&D tax credits and related fiscal incentives
- Privately funded
  - IP Rights

See "World IP Report 2011 – The Changing Face of Innovation", Table 2.2
www.wipo.int-edocs-pubdocs-en-intproperty-944-wipo_pub_944_2011.pdf.webloc

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Deliberate Planning for Innovation-Based Growth

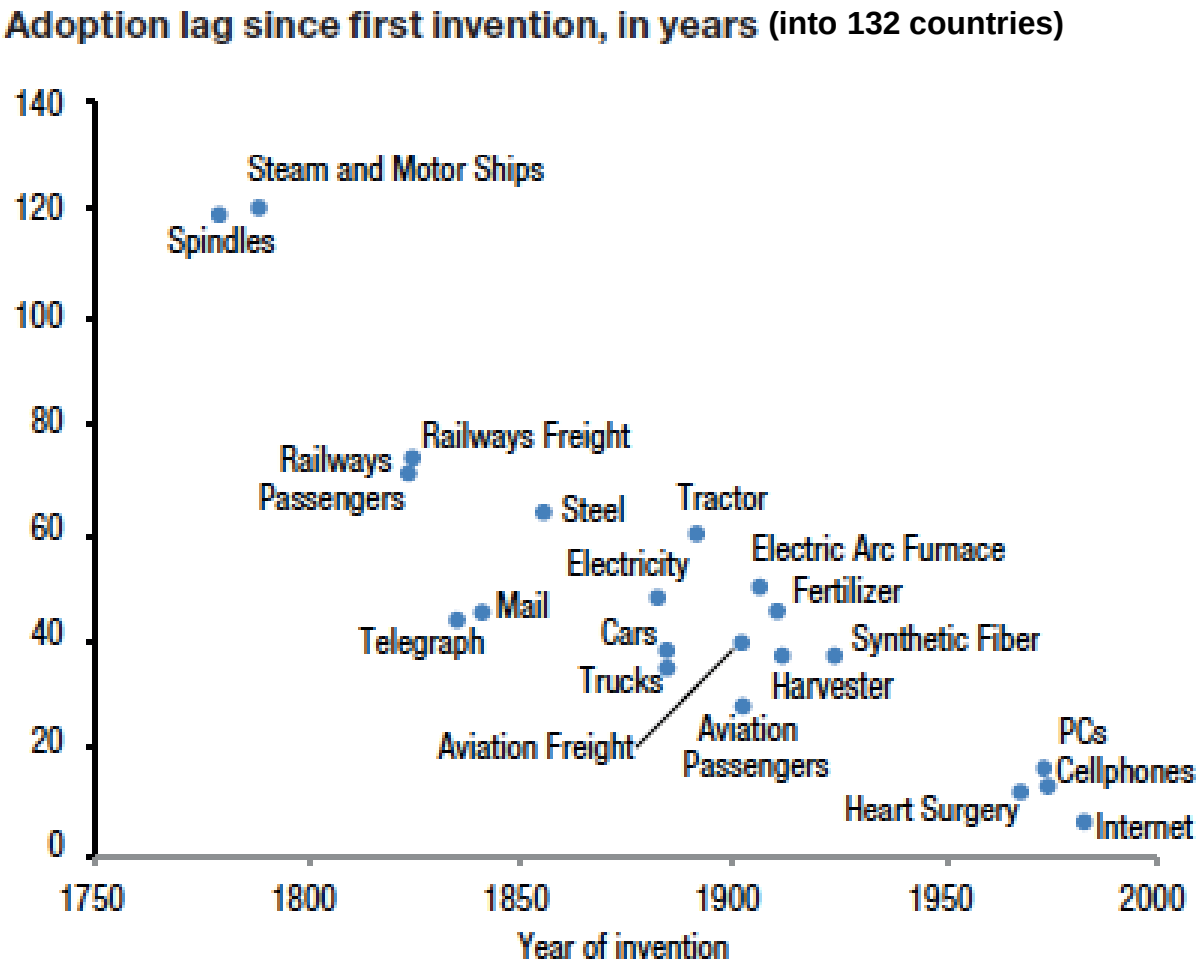
- Strong patent system
  - Access to meaningful IP enforcement for all businesses
    - Reliability
    - Predictability
    - Affordability
    - Time to resolution
- National policies: high R&D expenditures as percent of GDP
  - Mechanisms can include tax and other business incentives
  - *Shown to correlate with strong innovation growth*
- Finally: review free flow of people, goods, services
  - *Cf.* Silicon Valley and U.S. as a whole: readily available mobility across large market
  - *vs.* Europe: much freer than earlier, but there are still barriers leading to difficulties in obtaining goods and personnel, and often higher prices

How does increase in innovation contribute to development across borders?

- Technology diffusion
  - Products
    - Embedded technology
      - Import of certain products benefit recipient region without adoption of production processes
      - E.g. vaccines, antibiotics, mosquito nets
  - Know-how
    - Adoption will depend upon absorptive capacity
  - Patents as instruments of technology transfer
    - Patent disclosures
    - Licenses

Technology Diffusion – Adoption Lag

Adoption has accelerated into low- and middle-income countries



World IP Report 2015 – Breakthrough Innovation and Economic Growth, Figure 1.7
http://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2015.pdf

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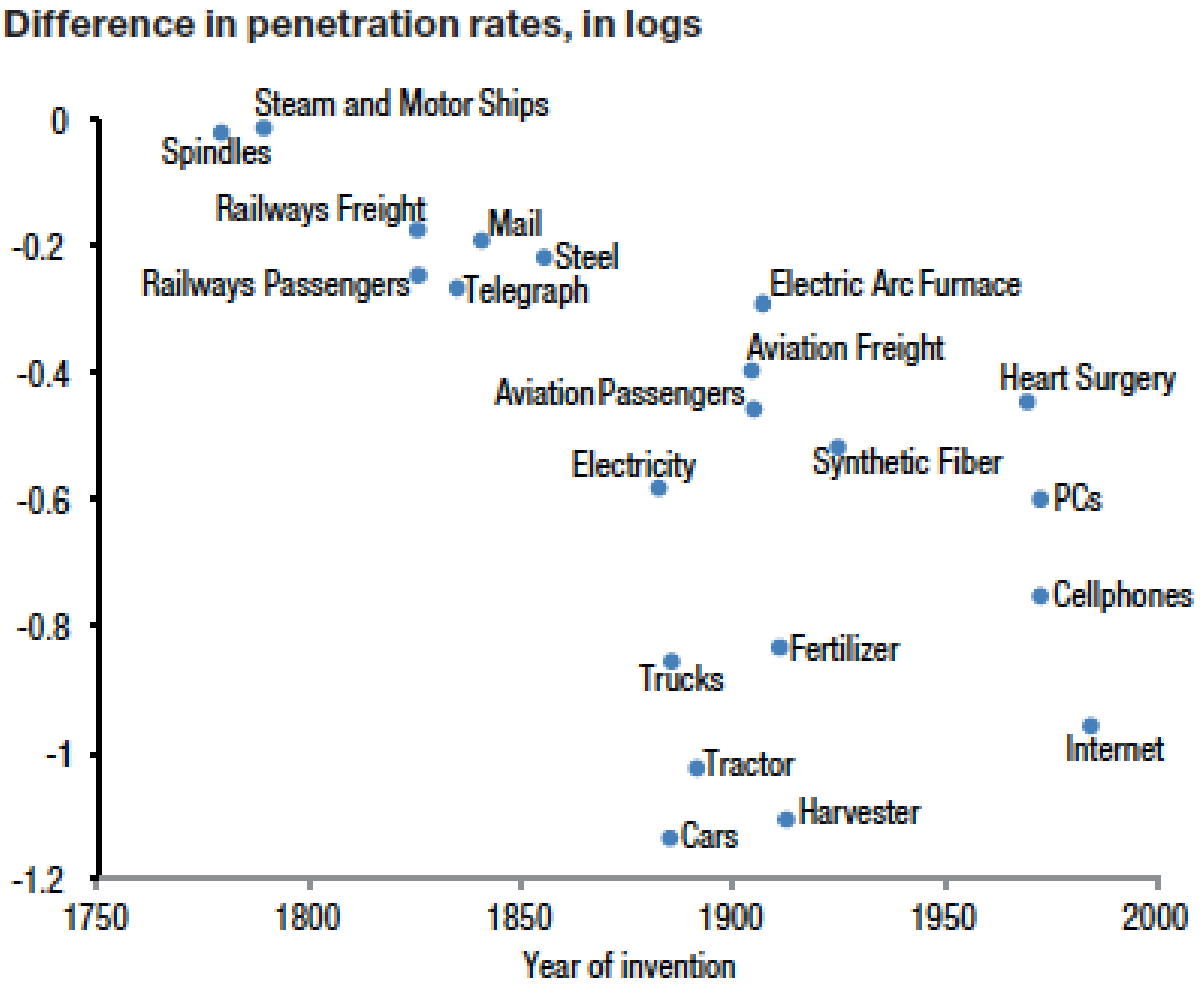
Technology Diffusion – Penetration

Range of uses is higher in developed countries



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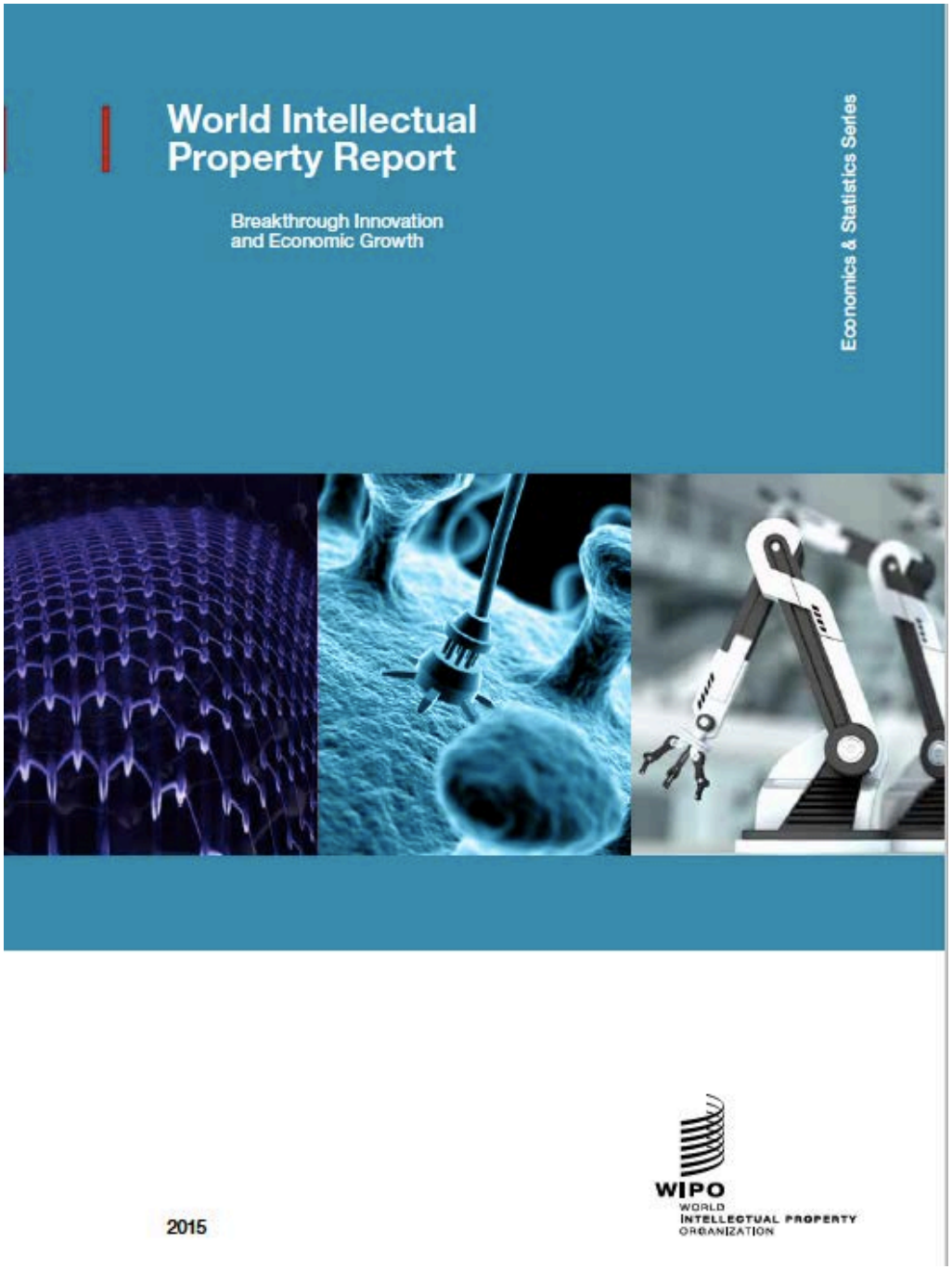

- WIPO: *Breakthrough Innovation and Economic Growth*
- Analyzes linkages between innovation, IP and growth
- Studies cases of historical & current breakthrough innovations

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http://www.wipo.int/edocs/pubdocs/en/wipo_pub_944_2015.pdf

Breakthrough Innovations
Historical Cases

- Airplanes
  - Licensing was important to technology dissemination
  - However, *patent disclosures per se* were less important
- Antibiotics
  - Patents seem to have been important in promoting innovations (e.g. early Bayer patents)
  - Trademarks also provided important competitive advantages (again, Bayer)
- Semiconductors
  - Patents have been highly significant
    - Especially as means of sharing technology (cross-licensing, including sharing trade secrets)

Breakthrough Innovations
Historical Lessons Learned

- In all 3 cases, innovators relied heavily upon IP rights
- Knowledge sharing flourished
  - Amateur airplane clubs resembled today's open-source
    - Patenting followed later
  - Research tools for antibiotics were freely available
  - Semiconductor cross-licensing
- Most patenting was in high-income countries
  - Thus, patent rights may not have helped or hindered diffusion *per se* to low-income countries
  - But IP rights were likely important to the innovations, which contributed positive developments to all countries (including developing countries)

Breakthrough Innovations

Current Cases with future breakthrough potential

- 3D Printing
  - Presents challenges to IP system (easy copying of objects protected by copyrights and designs; difficult to enforce)
  - Possibly great impact on developing countries (easy local manufacture of goods otherwise difficult to obtain)
- Nanotechnology
  - Mostly unrealized product potential – for the moment
  - *Disclosure* function of nanotechnology patents seems more effective than in other fields (scientists are reading the patents)
- Robotics
  - Patents are widely used – but so is collaborative innovation
  - Applications in automotive/medical/electronics fields, etc.
  - Potentially highly significant for worldwide benefits

Breakthrough Innovations

Current cases – Lessons and expectations

- Already significant economic activity (especially robotics)
- Development impacts may be more through *availability of products* than use of the processes
- Government funding has been important to all 3 fields
- Innovators in these 3 areas are patenting heavily
  - However, there have been very few IP conflicts (so far)
  - 3D printing and robotics innovators share in open-source manner
- By far the most patenting is in high-income countries
  - This implies that impact on development in low-income countries will largely be through dissemination of products and, as absorptive capacity allows, technology transfer

Planning for Innovation- & IP-Related Development

- Countries should support strong STEM education (science, technology, engineering, and mathematics)
  - Shown to correlate with strong innovation growth
- Particular attention should be paid to supportive policies for SMEs (small and medium-sized enterprises)
  - A large portion of innovation is from SMEs
- Businesses should include IP protection as integral part of their business plans
  - Not only patents, but also copyrights, trademarks, designs, trade secrets
- IP policies should take into account *where, whether and when stronger IP will help*
  - Likely effects of IP upon development should be assessed
    - "Development" should include both economic and human factors

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Thank you!

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