Innovation and IP's Contributions to Addressing Global Social, Economic, and Health Challenges

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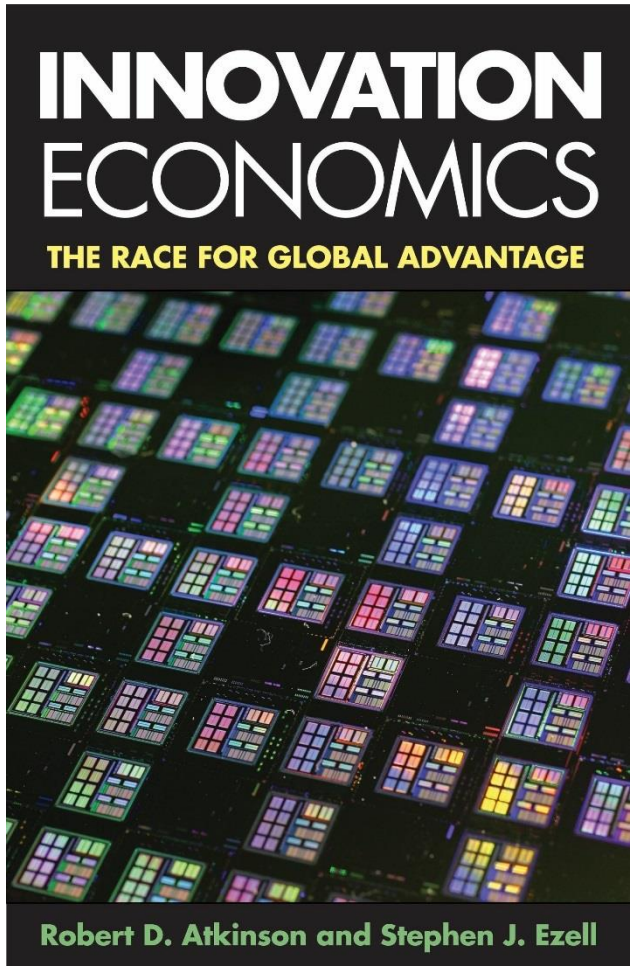
Innovation Economics: The Race for Global Advantage

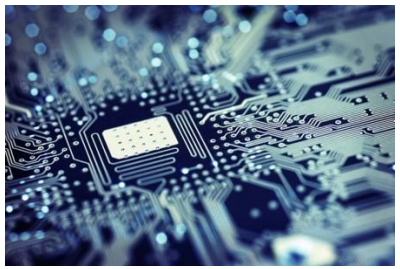


- A new theory and narrative of economic growth.
- Recognizes innovation as the product of intentional human action.
- Places knowledge, technology, entrepreneurship, and innovation at center of economic development.
- A focus not on *allocative efficiency* but on *productive* and *dynamic* efficiency.



Innovation Industries Share Three Distinct Characteristics

1. They compete by inventing next-generation products or services.
2. They are characterized by very high initial fixed costs (e.g., R&D/design), but low marginal costs of production.
3. They fundamentally embody and depend on intellectual property.



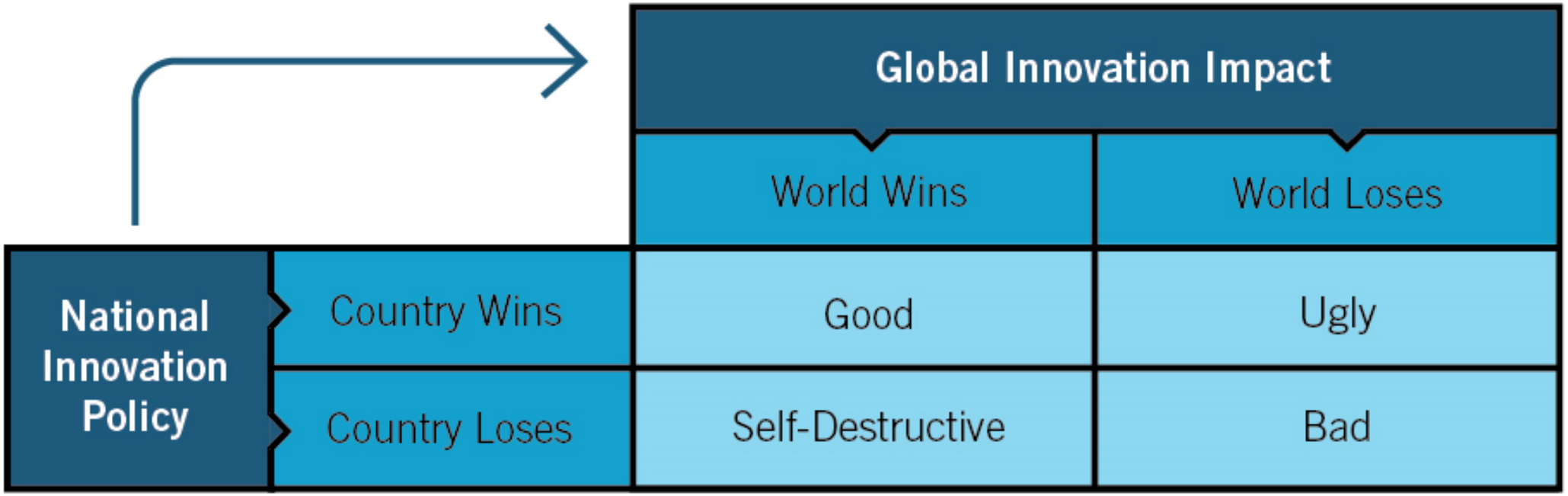




Necessary Conditions for Global Innovation to Flourish

1. Access to large markets (e.g., economies of scale).
2. No excess (e.g., non-market-based) competition.
3. No "forced localization requirements" that unnecessarily fragment global production systems.
4. Robust intellectual property rights and protection thereof.

How Nations' Policies Impact Global Innovation



IPRs Are Vital to Innovation, As They:

1. Create incentives for domestic innovation.
2. Enable a virtuous cycle of innovation.
3. Induce knowledge spillovers that help others to innovate.
4. Boost domestic levels of R&D, FDI, and exports.
5. Promote the international diffusion of technology, innovation, and knowhow.

Ache Laboratories and Acheflan

Ryan: “Patents provided incentives for biomedical technology entrepreneurs to make risky investments into innovation in Brazil.”

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Patent Incentives, Technology Markets, and Public–Private Bio-Medical Innovation Networks in Brazil

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Summary. — Contested is whether patent laws promote indigenous technology invention and innovation in developing countries. Brazil reformed its patent laws in 1996 to permit pharmaceutical product patents. Study of five post-patent law reform bio-medical technology invention and innovation projects in the state of Sao Paulo supports the propositions that patents provide incentives to Brazilian bio-medical technology entrepreneurs to make risky investments into innovation and that patents facilitate technology markets among public–private technology innovation networks, both Brazilian collaborations and North–South collaborations. Brazil enacted a technology law in 2005 that encourages public–private technology innovation through patent incentives and patent-facilitated technology markets.
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Key words — technology innovation, technology networks, patents, intellectual property rights, bio-medical technology, Brazil

1. INTRODUCTION

The 1994 World Trade Organization Agreement regarding Trade-Related Intellectual Property Rights obliges all WTO members to meet certain minimum standards of intellectual property law and enforcement and this means that scores of developing countries must provide higher levels of protection than has been their policy and practice in the past. Contested is whether patent laws promote indigenous technology innovation in developing countries. Runge (2006) rejects enclosure through intellectual property protections to promote technology progress in the North and says that the countries of the South have even more to lose from patent-based enclosure. Evans (2005) calls for an open science model for technology progress in developing countries. The development model should be non-proprietary and non-intellectual property-oriented. A developing country-based scholar says that stronger intellectual property rights in countries such as her Colombia will inhibit scientific research (Forero-Pineda, 2006). She argues that developing country scientists should participate in international professional networks to achieve science and technology advancement.

Though these scholars do not provide empirical evidence to support their arguments, they do ask important questions for development studies. Research universities, scholarly journals, and science conferences are the institutions that drive scientific progress (Pyenson & Sheets-Pyenson, 1999), but are these institutions sufficient to drive national technology innovation in developing countries (or developed countries, for that matter)? Technology innovation drives long-run national economic growth (Romer, 1986, 1990). Technology stasis leads to national economic stagnation; technology progress leads to national economic growth (Grossman & Helpman, 1991), so it is important to identify the institutional frameworks that best promote national technological innovation in developing countries. Do patent laws provide incentives to entrepreneurs in developing countries to make risky investments into technology innovation? Do patent laws facilitate the development of technology markets among public–private technology innovation networks? Do patent laws facilitate North–South technology innovation collaborations?

This is a study of invention and innovation in national technology development.

> “Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out into practice. ... While inventions may be carried out anywhere, for example in universities, innovations occur mostly in firms, though they may also occur in other types of organizations, such as public hospitals. To be able to turn an invention into an innovation, a firm normally needs to combine several different types of knowledge, capabilities, skills, and resources” (Fagerberg, 2005, p. 4).

Post-patent law reform bio-medical technology invention and innovation in Brazil is studied here. Brazil has a long-established pharmaceutical industry, but Brazilian bio-medical R&D traditionally meant that their public and private drug-makers reverse-engineered international pharmaceuticals so that they could manufacture and market medicines and vaccines innovated in the North to the Brazilian marketplace. Brazilian pharmaceutical makers were at liberty to reverse-engineer, manufacture, and market products under patent in the United States and Europe because pharmaceutical compositions were not patentable subject matter in Brazil. But, in 1996 the Cardoso administration led the Brazilian congress to amend the patent laws with Law No. 9,279 to allow for the patentability of pharmaceutical product patents so that, subject to procedural processes and some restrictions, only patent-holders or their licensees would be permitted to market under-patent medicines.

Bio-medical technology invention and innovation in the state of Sao Paulo is the focus of study. The state of Sao Paulo is the wealthiest state of Brazil, representing some 40% of the gross domestic product of the country, and is the main scientific and business center of the country. Federal research support and “the strong support by the state government makes the state

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Source: Michael Ryan, “Patent Incentives, Technology Markets, and Public-Private Biomedical Innovation in Brazil”

Innovate4Health Series https://medium.com/innovate4health







Arthur Zang

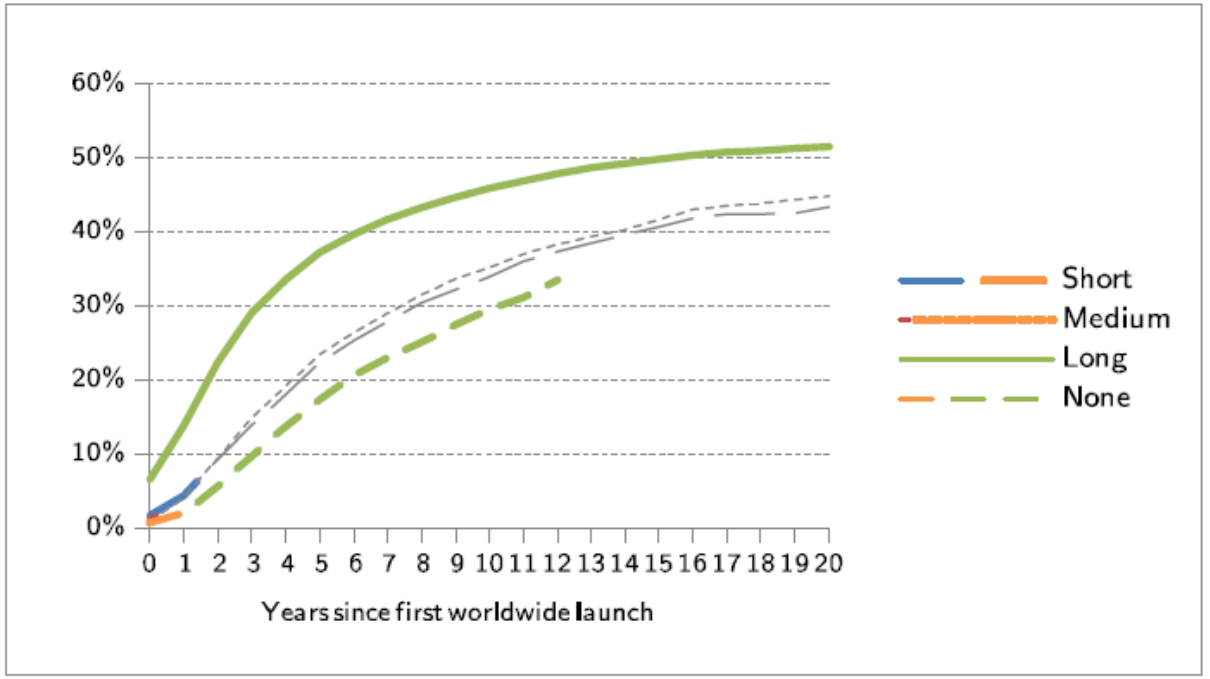
"Patents enable you to protect yourself against rivals who simply want to copy your work."



Robust IPRs Support the Diffusion of Innovations

- Study of 642 new drug launches in 76 countries from 1983 to 2002.
- Finds speed/extent of diffusion strongly associated with countries' patent and price regulation systems.
- Moving from a regime of no product patents to long product-patent terms reduces drug launch lags by 55%.

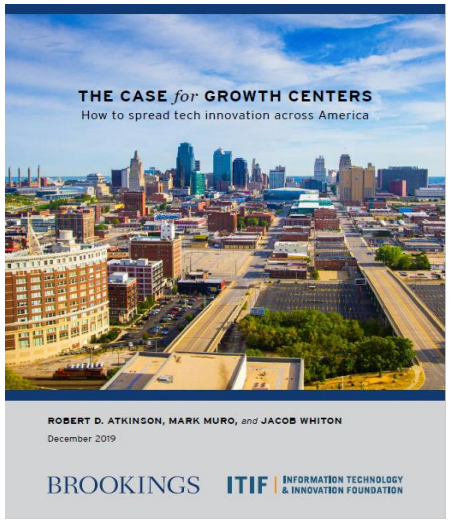
Fraction of Drugs Launched by Patent Regime

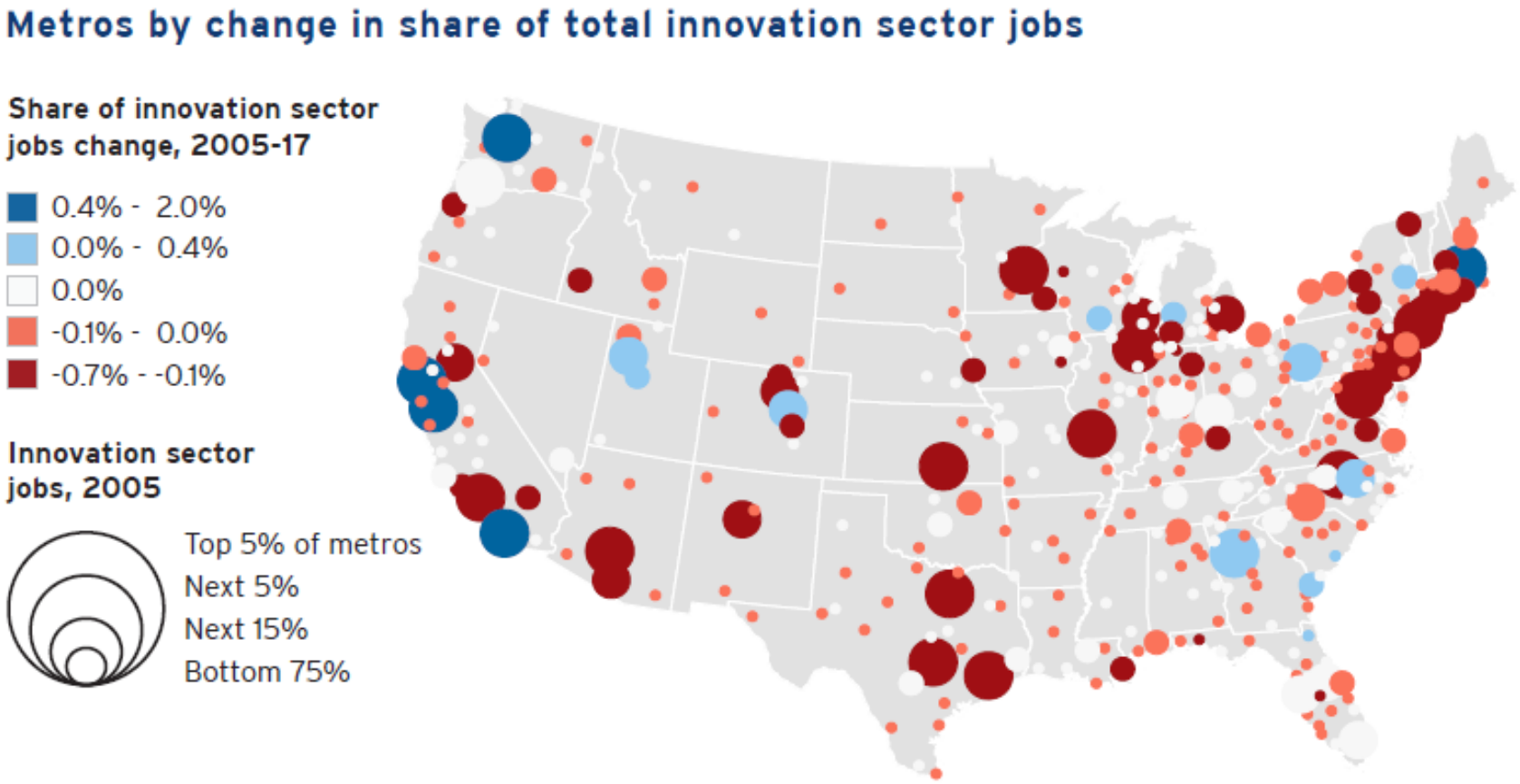


Source: Cockburn, Lanjouw, and Schankerman, Patents and The Global Diffusion of New Drugs, 2016

But Gains From Innovation Are Not Evenly Distributed

One-third of jobs in innovation-based industries are concentrated in just 14 U.S. counties.





Source: ITIF and Brookings, "The Case for Growth Centers: How to Spread Tech Innovation Throughout America," December 2019

Innovation & IP Policy Recommendations for Brazil

- ✓ Turn Brazil's universities into vital engines of innovation.
- ✓ Offer entrepreneurial leave programs for students and faculty.
- ✓ Address lengthy patent exam times and offer patent-term extension.
- ✓ Offer regulatory data protection for biopharmaceuticals.
- ✓ Set a goal of becoming a G20 life-sciences innovator.



Obrigado!

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