TRIPS at 20: Evidence on Innovation, Use, and International Technology Flows

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Globalization of the IP system

- TRIPS, WIPO efforts, RTAs, BITs, and unilateral reforms have had large impacts on measured levels of patent strength.
- There have also been large changes in copyrights, trademarks and plant variety legal protection.
- More recently we’ve seen significant legislative reforms in geographical indications.
- By some measures patent reforms were stronger than trade liberalization since 1995.
What is this reformed system supposed to accomplish?

- Reduce apparent distortions to trade arising from highly variable IP systems.
- Expand trade in high-technology goods.
- Support markets for international knowledge transfer and diffusion.
- Improve global and national innovation incentives.
- Encourage R&D in technologies for the needs of poor countries.
- Improve consumer guarantees of product origin, thereby raising safety and investments in quality.
- Build and support global markets for creative activities.
- Facilitate price differentiation across markets.
Technology transfer and innovation: indirect evidence

• The period since TRIPS has seen growth in technology exports of major emerging economies (Table 1).

• Also have observed large increases in the participation of developing countries in global IP registrations:
  • DC patent apps abroad: 11,459(1995) to 95,168(2010)

• And relatively fast growth in weighted R&D/GDP ratios (2000-2010):
  • 26 developing countries: 3.7% per year;
  • 35 emerging countries without China: 2.8% per year;
  • China: 9.5% per year;
  • 28 developed countries: 1.3% per year.
## Table 1 Indicators of Technology Transfer to Selected Countries

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<th>Country</th>
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<th>Country</th>
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<td>India</td>
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Source: UN Comtrade, UNCTAD World Investment Report, World Development Indicators

High-technology trade includes pharmaceuticals, electronic machinery and aerospace equipment

*a data for 2000
Caveats

• These changes are concentrated in a few countries and industries.
• There is little evidence of such changes among the poorest developing economies.
• Patent and TM statistics are imperfect measures.
• We need more systematic evidence based on extensive data and statistical analysis.
• Following is a brief review of recent econometric evidence.

Qualifications:
• Research is difficult due to data scarcity, measurement problems, causation issues, and confounding factors.
• Relatively little research focuses on TRIPS itself.
• Conclusions are already somewhat dated.
Patent reforms and innovation: mixed messages

- It is remarkable how little is known about this basic question.
- Early studies were pessimistic about impacts in DCs:
  - Reforms raise patenting in the US by developed countries (MCs) but reduce it by developing countries (DCs) (Schneider JDE 2005).
  - Multinational firms expand R&D and local patenting in MCs, no impact in DCs (Allred-Park JIBS 2007).
  - Non-resident patenting rises after reforms in middle-income countries; resident patenting rises does not (Branstetter et al QJE 2006).
  - Patent applications in US rose from middle-income economies with high secondary education (Chen-Puttitanun JDE 2005).
Patent reforms and innovation: mixed messages

• Later studies are more optimistic:
  • Pharma patent applications in US rose from middle-income DCs with higher skills and economic freedom (Qian REStat 2007).
  • US MNEs expand technological economic activities of local affiliates in larger developing countries after reforms (Branstetter, et al JIE 2011).

• Exception: there is little evidence that reforms have raised private R&D aimed at needs of poor countries (Kyle and McGahan REStat 2014).

• Patent rights do play a positive role in such work in universities, foundations, and international organizations.
IPR reforms and international technology transfer

• This is the primary area of inquiry for international trade economists.
• Development economists largely expected negative impacts.
• But IPRs should address market-information problems in ITT via:
  • raising appropriability where imitation costs are low;
  • reducing contracting costs and raising legal certainty;
  • reducing opportunism through lower transactions costs;
  • Supporting markets for technology brokers.
• What are the channels of ITT?
  • High-technology input trade;
  • Foreign direct investment (FDI);
  • Technology licensing;
  • Skilled-labor mobility;
  • Information flows within production and research networks.
IPR reforms and ITT

• Casual evidence (ignoring great recession years):
  • N-S Trade in high-tech, intra-firm inputs continues to rise faster than total trade (vertical production).
  • N-S FDI and licensing volumes also rise relatively rapidly.
  • Rapid emergence of global innovation networks.
  • Little evidence of growth in ITT to poorest countries.
IPR reforms and ITT

- Econometric studies with recent data:
  - Patent laws matter to OECD firms in IPR-sensitive sectors in choosing production locations in Eastern Europe (Javorcik EER 2004).
  - OECD exports of high-technology goods rose faster to DCs with larger patent reforms post-TRIPS (Ivus JIE 2010).
  - Manufacturing exports from middle-income economies rose significantly over time in TRIPS period (Maskus-Yang working paper 2015).
  - This study also finds that inward patent applications seem to support export growth.
IPR reforms and ITT

- Affiliate licensing, value added, sales, employment, and exports of US MNEs rose post-reforms (Branstetter et al JIE 2011).
- Licensing by Japanese firms to affiliates and unaffiliated partners rise with patent strength (Wakasugi-Ito JTT 2009).
- IPRs positively offset the costs of distance in monitoring affiliate sales, so high-tech sales rise with patent rights (Keller and Yeaple AER 2013).
- IPR reforms above a threshold income level shift ITT from exports to FDI then to licensing (composition effect); (several studies).
Reasonably robust conclusions about ITT

• There does seem to be a positive and strong causal impact of IPR reforms on inward ITT.
• But not yet in the poorest countries.
• And in middle-income and emerging economies there are threshold and complementarity effects:
  • Education and human capital;
  • Effective domestic competition;
  • Adequate governance and infrastructure.
• All of this suggests that reforms are strongly supporting technology diffusion, if not fully across countries.
• And countries need to invest in complementary supports to maximize this access to information.
Brief concluding observations

• The data and evidence suggest that WTO members have seen:
  • Substantial legal reforms in IPRs;
  • Increasing engagement with the utilization of IPRs;
  • Growing market transactions in technological information protected by IPRs.
• The extent of this engagement varies by income grouping.
• But there are many more issues to study, such as
  • Copyrights and creativity in developing economies;
  • How should we measure trade in intangibles?
  • How have patent reforms affected competition and pricing in pharmaceuticals and other goods?
  • Have IP reforms supported price segmentation and how has this affected product availability?