

Perspectives on IP systems for emerging and developing economies

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See <http://ap-in.org/apic2013/>

Does one size fit all? Four routes to technological improvement in emerging and developing economies

- Importing technology - Technology transfer from rich countries
- Top down - Domestic innovation in high technology fields
- Spreading out - Diffusion of innovation across firms and industries
- Bottom up – frugal innovation and alternative technologies developed by small and medium enterprises

1. Technology transfer and intellectual property rights

Two channels for importing technology:

- Foreign direct investment (FDI) by MNEs
- Licensing by domestic firms in LDCs

Trade Related IPRs – impact of TRIPS agreement:

- Did TRIPS enhance rate of FDI into LDCs? - Hassan et al. (2009) give cautious 'Yes'.
- Does a rise in FDI lead to more technology spillovers and faster economic growth? - Clark et al. (2011) find evidence mixed – *more positive if host LDC already has some high tech sectors*
- Did TRIPS make licensing less attractive to domestic firms? - Kanwar (2012) finds stronger IPRs are associated with *higher royalty and licence fees from LDCs*
- Suggests rich countries are now more willing to licence

2. Intellectual property rights and domestic imitation and innovation

- TRIPs agreement – would firms in LDCs suffer loss of *ability to imitate* as country strengthened IPRs ? (This might outweigh rise in domestic incentive to innovate)
- Chen and Puttitanum (2005) find contrast in benefits
 - low IPRs optimal in poorest LDCs (imitation dominates)
 - stronger IPRs better in richer LDCs (innovation dominates)
- C. and P. find empirically that the income per capita turning point is US\$854 p.c. in 1995 prices
- If uprate this value to current prices, which countries are above this turning point? (I calculate that India is above the turning point.)
- Kanwar (2013) finds that Indian productivity growth showed a step improvement in 2005

3. Intellectual property rights and diffusion

- Inherent contradiction - IPRs encourage invention of new technologies and products, but slow diffusion
- Green technology – speed is critical - global warming will get worse with rapid growth in LDCs
- Policy needs to work within existing legal framework to speed up adoption
- Support dual pricing? Rich countries pay higher prices - requires effective separation of markets
- Allow compulsory licensing by LDCs for some forms of technology?

4. Frugal/Jugaad innovation and alternative technology

- Frugal innovation - Design products and processes delivering key characteristics of modern products using less expensive materials and technology, e.g. plastic shell Nano car
- Jugaad – Hindi word for improvisation
- Alternative/appropriate technology (older econ. literature) – argued LDCs need technology and design to fit resource base that uses less capital and energy, more small scale and labour intensive
- IPR policies that may help – introduce utility patents, educate about design rights, trademarks
- Create equivalent of an open source register for manufactured items with General Public Licences?

Policy Route A - High technology sector strategies:

- Tailoring IP system to developmental needs
- Improving technology transfer from domestic science base
- Picking potential winners in high tech sector for public science funding
- Raising R&D incentives for private firms using general subsidies to R&D
- Improving markets for technology and increasing technology transfer from overseas

Tailoring patent policy for development

- Moir and Ping-Kun (2013) discuss fundamental requirements for a patent system to improve social welfare:
- (i) It must encourage technological innovation that would not otherwise take place and
- (ii) Must have spillover benefits greater than the cost of the restraint on competition
- To ensure (i) limit patents *to technological innovations requiring significant R&D investment*
- They would exclude natural discoveries, mathematically derived software, and methods of medical treatment
- To ensure (ii) any *patent must provide sufficient new knowledge, know-how or net consumer benefit* to offset the costs of the monopoly
- First-best option for a focused and efficient patent system is to *limit patent grant to highly codified inventions with large lumpy R&D costs* - this first-best option is denied by TRIPS
- Countries must be free to set 'inventive step' at a high level

Improving technology transfer from home science base (example - India)

India's Bayh Dole draft act – 'The Protection and Utilisation of Publicly Funded Intellectual Property Bill 2008'

- Not yet passed into law as too controversial
- Goes beyond US act as includes patents, trademarks and copyrights
- Places obligations on researchers to set up IP management system and sets large penalties if grantee does not comply with rules/objectives

Motivation for proposed changes:

- Raise technology transfer to industry and licensing revenues for universities
- Promote IP awareness, but risks inducing unnecessary IP according to Sampat (2009)

Saha & Ray (2013) have argued motivation of science researchers differs from that implied by the act

- Find that interest and productivity in research rise over career
- Driven by a 'consumption' motivation not investment in career

Picking winners – how easy, profitable?

Biotechnology

- Hanel et al (2013) explore the statistical relationship between PCT patenting and exports of biotechnology products for Brazil, Argentina, China and India
- Patenting activity by these countries has been rising rapidly
- For the Latin Americans there is no statistical relationship of patents with exports
- For China and India a rise in patenting was associated with rising exports
- This association did not strengthen post TRIPs as expected

Nanotechnology

- Greenhalgh (2013) discusses a decade of investment of public money in nanotechnology in India
- Large investment, many institutions involved and many science publications
- But very few commercial products – South Korea does much better in this field – how?

Policy Route B – Strategies to enhance diffusion and alternative technology

- Document domestic innovation in MSMEs - to see what (if any) use these firms make of IP and what factors constrain innovation
- Establish 'open source' technology registers alongside IP registers - to show population what can be used without licence as well as what needs to be licensed
- Ensure that rural populations have personal identity to permit them to engage in contracting and ownership
- Educate/train managers of MSMEs and encourage them to use IP and technology markets
- Change education and skills of rural poor so that they can work with knowledge transfer via ICT and adopt innovations

Indian examples of Policy Route B

- New database of innovation for MSMEs (micro and small or medium enterprises) in agriculture, industry, and services (enterprise data) – final report awaited from 2011 survey
- Creative commons for ‘Jugaad innovations’: Honey Bee network set up 1986-7 by Prof. Anil Gupta at IIM, Ahmedabad; aimed to seek out inexpensive new designs that are pro-poor and use green technology
- National Innovation Foundation established in 2000 in Ahmedabad using gov. funds with Honey Bee as a partner; now a repository of more than 50,000 grassroots innovations and traditional knowledge practices
- NIF aims to assess commercial potential and develop IP rights for inventors; offers prospects for matching ideas to venture capital; but NIF has been criticised for being too slow and adding costs to inventions so they fail in market place

More examples - empowering Indian MSMEs and rural poor

- UIDAI (Unique Identification Authority of India) started in 2009 an on-going identity registration system aiming to register all 1.2bn citizens
- Uses biometric data (photo, finger prints and eye scans) to provide unique ID number (AADHAAR) for each citizen; assists rural poor to obtain rights to education and benefits, but also to own IP assets and participate in IPR markets
- Community Services Centers - Nilekani (2008) identifies role of village IT kiosks since 2000 in Karnataka; this has been scaled up after contract in 2008 between Hughes India and Comat Technologies to supply 10,000 such kiosks over several Indian states (on-line information)

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