Perspectives on Intellectual Property Rights and Global Economic Development

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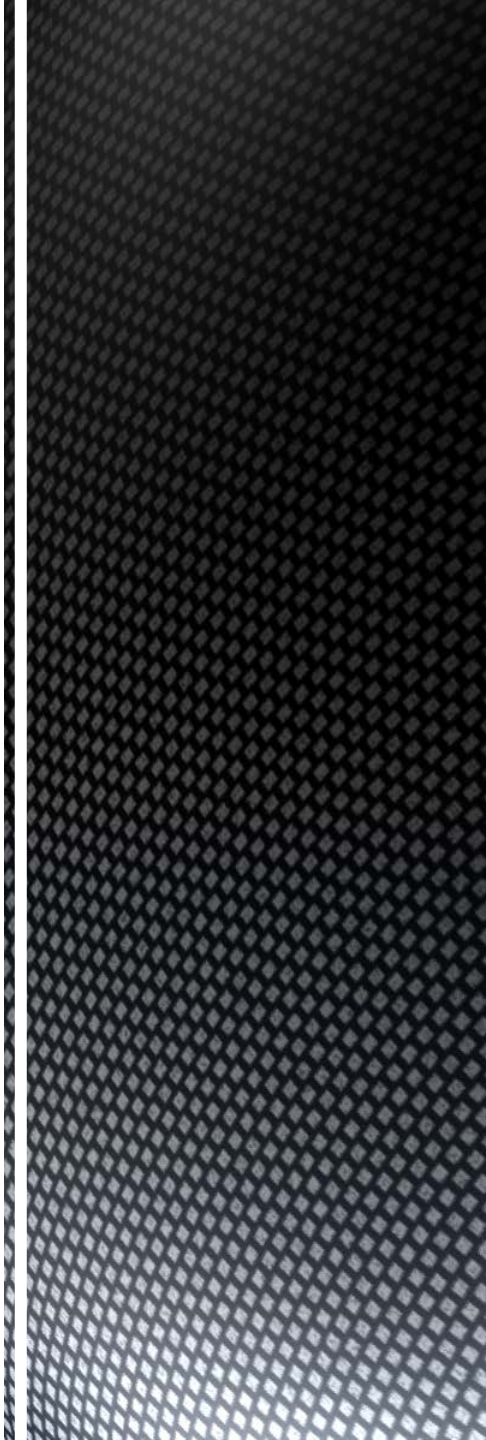
March 2013



Outline

(1) A Primer on Intellectual Property Rights (IPRs)

- Rationale
- Why Global?
- Recent Developments

(2) Tour of Recent Research

- Theoretical
- Empirical
- Complementary Studies

(3) Distribution of Gains between 'North' and 'South'

- Trends
- Explanations

(4) Policy Implications

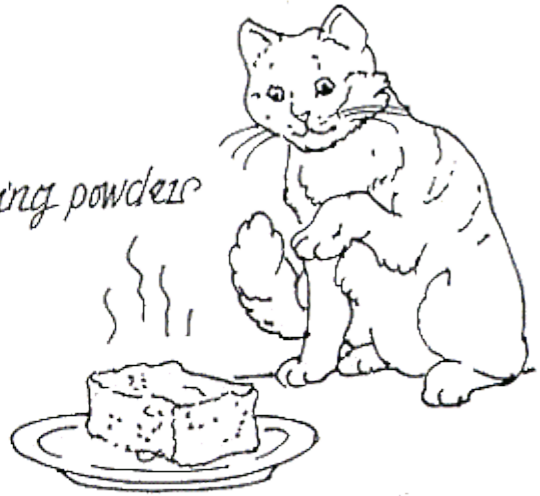
(1) A Primer on IPRs

- Types:
  - Patents, Copyrights, Trademarks, Industrial Designs, Geographical Indications, Plant Breeder Rights, Utility Models
- Rationale:
  - Market Failures in the *'Market for Technologies'*
  - Public Goods (e.g., knowledge)
    - Non-excludable
    - Non-rivalrous

warm up oven to 400° F

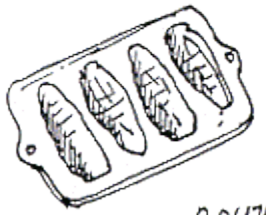
mix together:

1¼ c flour
¾ c Corn Meal
¼ c sugar
2 teaspoons baking powder
¼ teaspoon salt



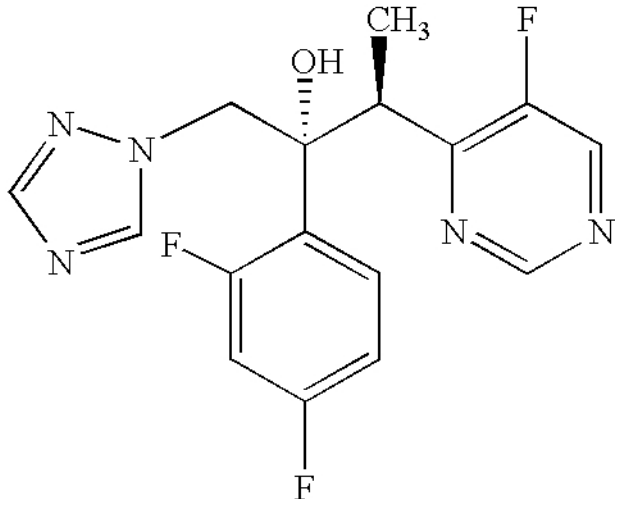
Then stir in:

1 c milk
¼ c olive oil
1 egg (beaten)



pour batter into a greased pan, and bake for 25 minutes. The pan can be a 8" or 9" baking pan. My favorite is a pan with corn cob shapes. If I use it, I don't bake them as long.

- Example: Drug Development



- Assume R&D cost = $100 million
- Average Cost (AC) = $10/pill
- Population suffering = 20 million

- Need Price > AC to recoup fixed cost
- *Competition: Price = AC in the long run*

i.e. zero economic profits

Qualifications:

- Patents do NOT create monopolies per se
- Patents do NOT restrict access to knowledge
- Patent rights are Territorial

Why Global?

- Trade, Foreign Direct Investment, International Licensing
- Strategic Trade and Discrimination
- Non-tariff Barriers to Trade
- International Positive Externalities

Key Policy Developments

- WTO's Trade-Related Intellectual Property Rights Agreement (TRIPS)
  - Uruguay Round (1986 - 1994)
  - Minimum Standards regarding scope & availability of IPRs
  - Remove Impediments to trade
  - Dispute Settlement Body
  - Bargain/Compromises between North and South
    - Extensions
    - Technology Transfer
    - Flexibilities (e.g., compulsory licensing)

From TRIPS Agreement *www.wto.org*:

Preamble

Members . . . [desire] to reduce distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade;

. . . [*Recognize]* also the special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base;

Article 7 Objectives

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

Article 64.1 Dispute Settlement

The provisions of … the Dispute Settlement Understanding shall apply to … the settlement of disputes under this Agreement except as otherwise specifically provided herein.

Article 66.2 Least-Developed Country Members

Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base.

TRIPS-Plus Free Trade Agreements (FTAs)

- Recent Trend: 'Bypass' multilateral agreement via regional trade agreements to expand IPRs …
- Examples: U.S. Jordan, CAFTA-DR, Trans-Pacific Partnership (TPP)
- Provisions:
  - Greater test data exclusivity
  - Patent Linkage
  - Restricted use of Compulsory Licensing and Parallel Imports
- Controversial

(2) A Brief Tour of Recent Research

- Theory (diverse)

Effect of IPRs:	Positive	Negative
Innovation	Appropriability	Costs of R&D Reduced Rivalry
Technology Transfer	Market Expansion	Market Power

- Qualifications
  - Alternative Means of Appropriation
    - *Non-monetary rewards, first-mover advantage, capital intensity, trade secrecy*
  - Economic Rent
  - Composition of Technology Transfer
    - *Exports vs. FDI: setup costs vs. low cost labor*
    - *FDI vs. licensing: leakage of sensitive information vs. market outreach*

(2) A Brief Tour of Recent Research

- Empirical Research (diverse)

Effect of IPRs:	Developed Countries	Developing
Innovation	Generally positive; varies by industry	Generally weak; effective if capacity for R&D exists
Technology Transfer	Inverted-U shape effects	Generally positive; substitution effects & complementarities

- Noteworthy:
  - Response of developing country innovation to IPR reforms is *mixed*, even in the pharmaceutical industry (cf. Kyle and McGahan (2012) *Rev. of Econ Stats*
  - Tech transfer studies focus primarily on suppliers (e.g. their investments), not local consumers (e.g. price they pay for goods).

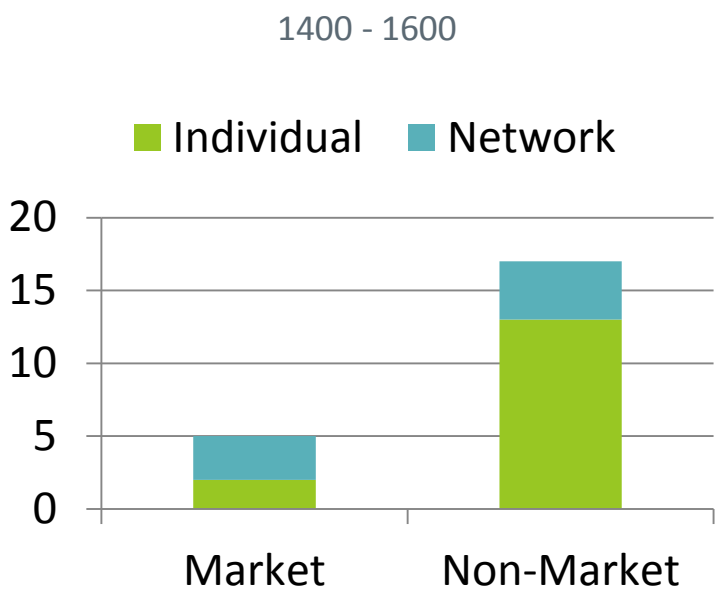
Complementary Research Issues:

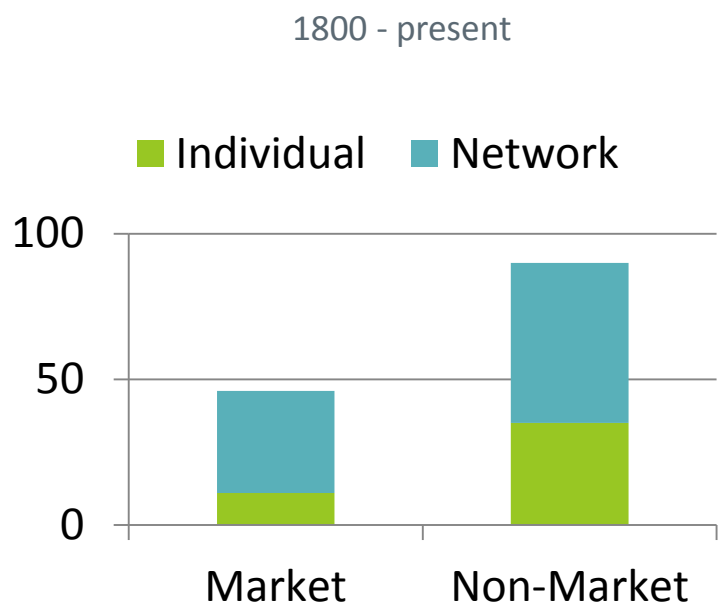
- Open Innovation
- Piracy

Open Innovation

- Information sharing, collaborative research, and non-proprietary innovations.
  - E.g., open source software, open biotechnology
- Differences between open and closed innovation systems
  - Commercial labs rely on secrecy & exclusivity
- Reduce Barriers to Knowledge Mobility
  - Allow ideas to "mate" (Matt Ridley *Rational Optimist…*, 2010)
  - Case of *Xerox* and *IBM*

Count of Breakthrough Ideas and Innovations





Source: S. Johnson (2010) *Where Good Ideas come from: The Natural History of Innovations*, Riverhead

Piracy

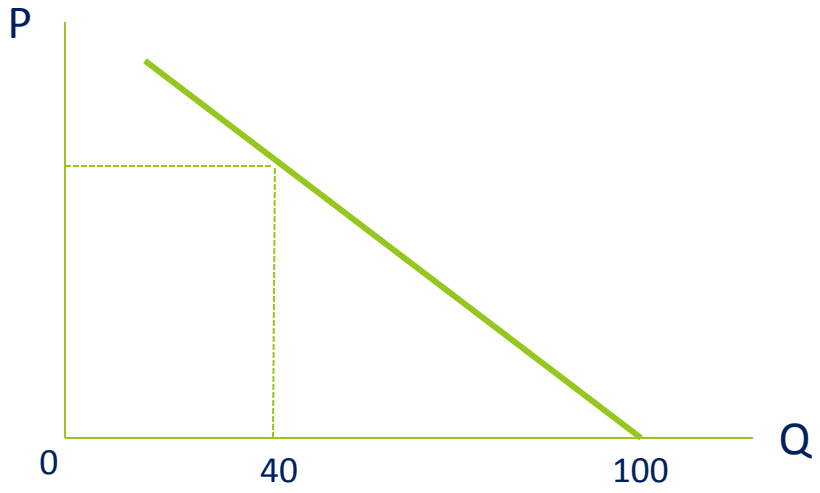
- Diverts sales from intellectual property creators and owners

Software Piracy Rates		
Region/Country	1995	2011
Asia-Pacific	64%	60%
China	96%	77%
India	78%	63%
South Korea	76%	40%
Taiwan	70%	37%
Vietnam	90%	81%
Africa & Middle East	78%	58%
Central & Eastern Europe	83%	62%
Western Europe	47%	32%
Latin America	76%	61%
North America	27%	19%

SOURCE: Business Software Alliance.
http://www.bsa.org/country/Research and Statistics.aspx.

Piracy

- Industry losses, however, somewhat exaggerated



- Piracy crowds out legitimate sales less than 1:1
  - Based on studies of theatre sales, music file sharing, and music downloading.
  - Sampling and network effects.
- Strong IPRs alone cannot combat piracy
  - Social norms and poverty are also determinants

(3) Global Distribution: Innovation

- Patent Priority Filings (by Inventor Country)

	1995	2009
Developed Countries	85.9%	67.4%
Developing Countries	14.0%	32.5%
Least Developed Countries	<0.1%	<0.1%

Source: PATSTAT

Top 10: Patents Granted in the U.S.

Rank in 2011	Country
1	USA
2	Japan
3	S. Korea
4	Germany
5	Taiwan
6	Canada
7	France
8	U.K.
9	China
10	Israel

Rank pre-1995	Country
1	USA
2	Japan
3	Germany
4	U.K.
5	France
6	Canada
7	Switzerland
8	Italy
9	Sweden
10	Netherlands

Source: USPTO.gov

(3) Global Distribution: Innovation

- Patent Priority Filings

	1995	2009
Developed Countries	85.9%	67.4%
Developing Countries	14.0%	32.5%
Least Developed Countries	<0.1%	<0.1%
Developing Countries*	**2.4%**	**1.6%**

* Excluding China, South Korea, and Taiwan

(3) Global Distribution: Innovation

- Business Enterprise R&D Performed

	1995	2009
Developed Countries	89.1%	74.3%
Developing Countries	10.9%	25.6%
Least Developed Countries	0%	0.00002%
Developing Countries*	**4.7%**	**4.7%**

* Excluding China, South Korea, and Taiwan
Source: UNESCO

Global Distribution: Technology Transfer*

	Trade		FDI		Licensing	
Year	1995	2010	1995	2010	2000	2010
Developed Countries	71.7%	59.4%	83.7%	75.8%	87.1%	81.0%
Developing Countries	27.7%	39.5%	16.0%	23.8%	12.9%	19.0%
Least Developed Countries	0.6%	1.1%	0.3%	0.4%	<0.1%	<0.1%
Developing Countries**	**20.9%**	**25.7%**	**13.3%**	**20.2%**	**8.6%**	**11.8%**

* Volumes measured in terms of sums of Export-Import Flows or Outward-Inward Stocks.
** Excluding China, South Korea, and Taiwan
Source: UNCTAD

Explanations: What's Behind the Statistics?

- Lags
- One-size doesn't fit all
  - Re: Harmonization of IP standards
  - Cf. Grossman and Lai (2004) American Economic Review
- Role of Imitative and Adaptive Innovation
  - Cf. Kim, Lee, Park, and Choo (2012) *Research Policy*
- Weak compliance with Article 66.2
  - Re: Least Developed Countries
  - Cf. Moon (2008), Barder, Park, and Reynolds (2012)

TRIPS Obligations

- Recall: Article 66.2
  - "Developed country Members shall provide **incentives** to enterprises and institutions in their territories for the purpose of promoting and **encouraging technology transfer** to least-developed country Members in order to enable them to create a sound and viable technological base."

- Article 67
  - "In order to facilitate the implementation of this Agreement, developed country Members shall provide, on request and on mutually agreed terms and conditions, **technical and financial cooperation** in favor of developing and least-developed country Members. Such cooperation shall include assistance in the preparation of laws and **regulations** on … intellectual property rights ..., and shall include support regarding the establishment … of domestic **offices and agencies** relevant to these matters, including the training of personnel."

Decision of the Council for TRIPS of 19 February 2003

- *Having regard to* **Article 66.2** of the Agreement on Trade-Related Aspects of Intellectual Property Rights (the "TRIPS Agreement");

:

:

- *With a view to* putting in place a **mechanism** for ensuring the **monitoring** and full **implementation** of the obligations in Article 66.2, as called for by that Decision;

:

:

- Developed country Members shall submit **annually** reports on actions taken or planned in pursuance of their commitments under Article 66.2. To this end, they shall provide new detailed reports every third year and, in the intervening years, provide updates to their most recent reports.

Developed Country Submission of Reports on Technology Transfer Activities (per Article 66.2 TRIPS)

Countries	2003	2004	2005	2006	2007	2008	2009	2010	2011
Australia	Yes			Yes	Yes	Yes	Yes	Yes	Yes
New Zealand	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Norway	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Switzerland	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Canada	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Japan	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes
U.S.A.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
European Union	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Austria	Yes				Yes	Yes	Yes	Yes	Yes
Belgium					Yes	Yes	Yes	Yes	Yes
Denmark	Yes		Yes		Yes	Yes	Yes	Yes	
Finland	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
France		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Germany	Yes	Yes	Yes	Yes	Yes	Yes*	Yes	Yes	Yes
Greece									
Ireland		Yes	Yes			Yes			
Italy			Yes						
Netherlands	Yes		Yes						
Portugal									
Spain	Yes	Yes	Yes		Yes	Yes	Yes	Yes	
Sweden	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes
United Kingdom	Yes				Yes		Yes	Yes	Yes

Source: World Trade Organization, http://www.wto.org/english/tratop_e/trips_e/techtransfer_e.htm

* No narration; only a table of programs submitted.

YES -- indicates that a report was submitted

Selected Examples of Technology Transfer Activities reported in the Article 66.2 Submissions, 2011-2012	
Authority	Program
European Union	Supply of small and medium farm machinery to N. Korea, 2 million euros
European Union	Support for Energy and Environment to Africa Regional, 28.2 million euros
European Union	Private Sector Development in Ethiopia, 11 million euros
European Union	Support to Innovative Enterprises in Ukraine, 2.5 million euros
Denmark	Cotton Production in Uganda
Finland	Business partnership support in Official Development Assistance (ODA)-countries, 4.3 million euros
Ireland	Capacity Building in African countries
Sweden	Risk capital to companies investing energy/environment in less developed countries (LDCs)
United Kingdom	Event for Mobile Phone Banking, 30,000 British pounds
United Kingdom	Teaching English in Bangladesh
United Kingdom	Funding for Higher Institutions in Africa and Asia, 3 million euros
United States	Clean Technology Fund for Developing Economies
	Partnerships between U.S. Government agencies (USAID, EPA, CDC) and developing countries
	Licensing of Health Care Technologies (Vaccines), Funding of R&D on Infectious Diseases by the NIH
	OPIC Provision of Risk Insurance and support for U.S. investment in emerging markets, $800 million
	African Growth and Opportunity Act, providing duty free access to goods from sub-saharan Africa
	U.S. Department of State and Department of Commerce Workshops and Agreements on Sci & Tech
	Trade Capacity Building Assistance to less developed countries (LDCs), $771 million
	Millennium Challenge Corporation investments in developing world, $8 billion as of Aug. 2011
	U.S. Department of Agriculture Technology Transfer: distribution of plant germplasms to LDCs
	USPTO training and technical assistance to less developed countries (LDCs)
Notes:	
Amounts spent on programs are not specified if there was inadequate information	
USAID denotes U.S. Agency for International Development, NIH National Institutes for Health,	
EPA Environmental Protection Agency, CDC Center for Disease Control, NSF National Science Foundation	
OPIC Overseas Private Investment Corporation, USPTO U.S. Patent and Trademark Office	

(4) Policy Implications

- IPRs: Costs & Benefits
  - Tradeoffs
  - Evidence on impact of TRIPS is inconclusive
- Re: IPRs and Innovation
  - Need more openness and less exclusivity
  - Foster adaptive and incremental innovation (as stepping stones)
  - Stop piracy not only with tough laws, penalties, and technology protection measures, but also with pro-development, anti-poverty policies.
- Re: IPRs and Technology Transfer
  - Least developed countries require an industrial, technological base and reforms in governance.
  - Developed countries need to better comply with their technology transfer obligations – provide more substantive and targeted transfers.

(4) Policy Lessons

- Moratorium on TRIPS-Plus FTAs?
  - ACTA (Anti-counterfeiting Trade Agreement)
  - TPP (Trans-Pacific Partnership Agreement)

- Issues:
  - Do they limit developing economies' access to technology?
  - Are the provisions too burdensome (for their stage of economic development)?

- EC Regulation 1383
  - Seizure of infringing goods in transit within European Union (though not infringing outside the EU).
  - ACTA contains a similar provision