

International Licensing and Intellectual Property Rights

Evidence from U.S. Multinational
Firms

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Issue: Do stronger IPRs encourage technology transfer to less developed economies?

Outline:

- 1) Motivation/Background
- 2) Previous Studies
- 3) Data
 - Intellectual Property Regimes
 - International Licensing (U.S. firm level)
- 1) Empirical Analysis
- 2) Summary/Implications

1) Recent Developments in Global IPRs

- WTO – TRIPS Agreement (1995)
- Key Premise: Developing Countries to “Benefit”
 - Article 7 of TRIPS (“contribute . . . to the transfer and dissemination of technology . . .”)
 - Article 66.2 of TRIPS (“Developed country members shall provide incentives . . . for the purpose of . . . encouraging technology transfer to least developed country members . . .”)
- Technology Transfer vs. Local Innovation

Theoretical/Policy Controversies

- 1) Opponents of stronger IPRs
 - Reduce Access to New Technology
 - Restrict learning by Imitation

- 1) Proponents of stronger IPRs
 - Stimulate Innovation in the long run
 - Increase incentives to market technologies

In principle, IPRs can have positive & negative effects on “incentives” to license:

- **Economic Returns Effect**
 - reduction in risk of imitation, unauthorized copying.
 - better enforcement & increased bargaining power of licensor
- **Monopoly Power Effect**
 - reduced competitive pressures → slow down in innovation → fewer technologies/creations available for licensing
 - IP holders choose to exploit the creations themselves rather than license to 3rd parties.
- Which ‘**Effect**’ dominates?

Evidence, thus far, is limited

2) Previous Studies

- Contractor (1984)
- Mansfield (1994)
- Smith (2001)
- Yang and Maskus (2001)
- Nicholson (2003)
- Branstetter, Fisman, & Foley (2005)
- Fosfuri (2005)

Gaps & Limitations

- Aggregate Data
- “Snapshot” Year
- Small Country Sample
- Subjective Assessment of IP regimes
- Lack of Controls for:
 - Type of IPR
 - Industry/Sector and Nature of IP
 - Alternative channels for technology transfer

3) Data

Two Areas:

- Intellectual Property Rights Indexes
 - Patent Rights
 - Copyrights
 - Trademark Rights
 - Enforcement Effectiveness
- Measures of U.S. Firm Level Licensing and other control variables:
 - R&D, Sales, etc.

A. Measures of Intellectual Property Rights

- Indexes (Quantitative Ratings)
- Over 100 countries
- 1960 – 2000 (every 5 years)
- Based on national laws and reports filed to authorities.
- Indexes designed to measure strength of IP rights, not quality of IP laws & policies.

Elements of each statutory index:

- Coverage
- Duration of Protection
- Membership in International Treaties
- Enforcement Mechanisms
- Restrictions

Patent Rights Index

Coverage (x/7)	Pharmaceuticals, Chemicals, Food, Plant & Animal Varieties, Surgical Products, Microorganisms, and Utility Models
Duration (x/20)	Years from date of application (or years from date of grant, in which case: x/17)
Membership (x/3)	Paris Convention, PCT, UPOV
Enforcement (x/3)	Preliminary Injunctions, Contributory Infringement, and Burden of Proof Reversal
Restrictions (x/3)	Compulsory Licensing, Working Requirements, and Revocation
Overall Score	Range: 0 - 5

Copyrights Index

Coverage/Duration (e.g. x/70)	Literary & Artistic Works, Performances, Sound Recordings, Films, Broadcasts, Computer Programs
Usage (x/3)	Extent of Private Use by 3 rd parties (Full, Medium, Low, or none)
Enforcement (x/4)	Criminal Sanctions, Preliminary Injunctions, Seizure/destruction, and anti-circumvention provision.
Membership (x/6)	Berne, UCC 1952, UCC 1971, Rome, Geneva, and Brussels Conventions
Overall Average Score	Range: 0 - 1

Trademark Rights Index

Coverage (x/6)	Service, Certification and Collective Marks, Colors, Shapes, and Well-known marks
Procedures/Restrictions (x/9)	Bona Fide Use, Licensing restrictions, use or lose, international exhibition, criminal penalties, local agent, generic marks, transferability, and priority
Membership (x/6)	Paris Convention, Madrid, Nice, Lisbon, and Vienna Agreements, and Trademark Law Treaty
Overall Average Score	Range: 0 - 1

Enforcement Effectiveness Index*

Enforcement	Score :
Not available or inadequate	0
Available but ineffectively carried out	$\frac{1}{2}$
Adequate	1

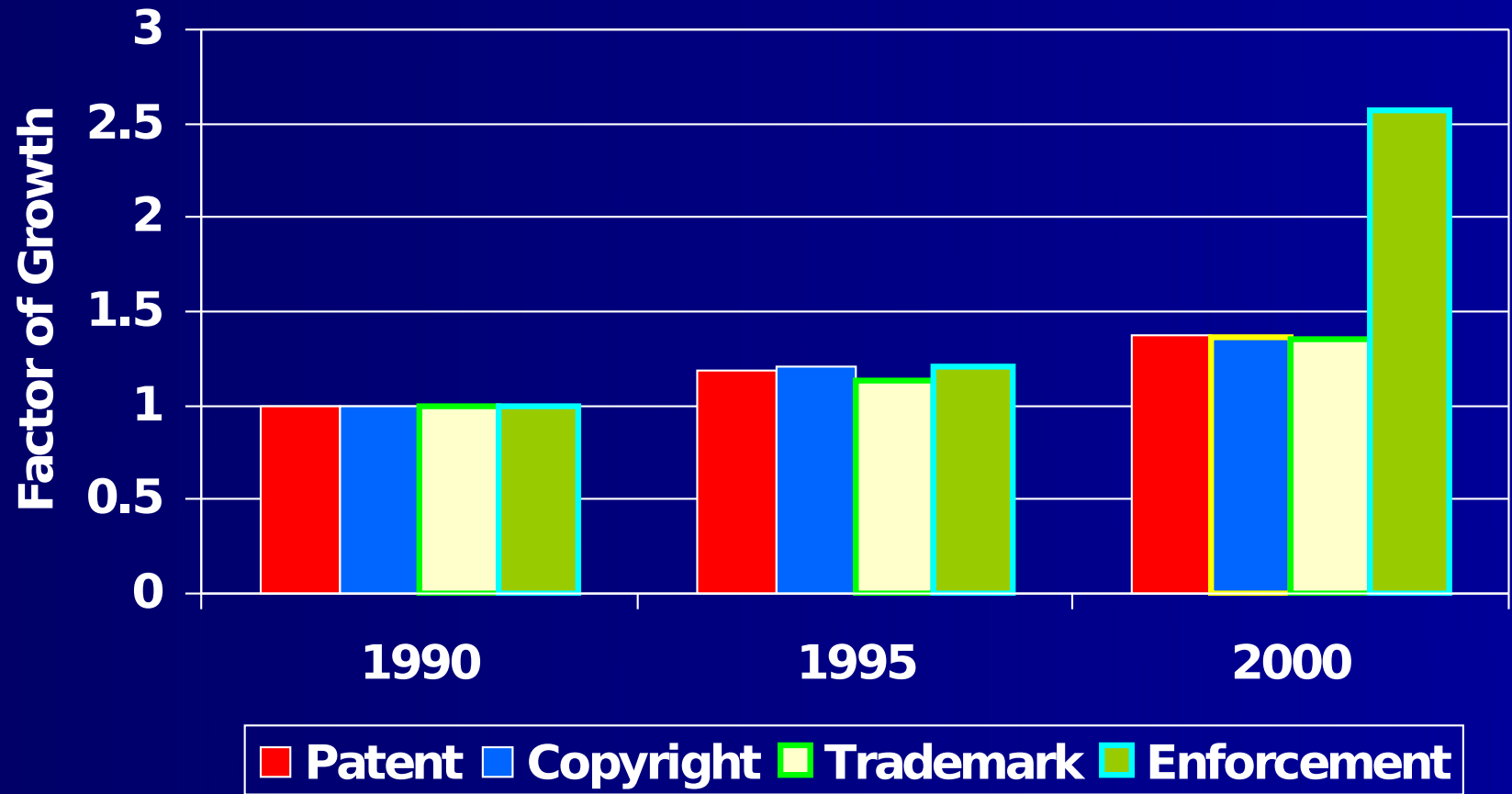
* Based on reports to the U.S. Trade Representative

Sample Statistics:

Sample Averages:	Patent Rights Index	Copyrights Index	Trademark Rights Index	Enforcement Effectiveness Index
All Countries	3.36	0.67	0.56	0.60
Developed *	3.87	0.74	0.62	0.91
Developing	2.81	0.59	0.49	0.26

* Classification based on GDP per capita > \$18,000 U.S.

Evolution of Average Index Scores for *Developing* Countries



Indexes are normalized so that 1990=1

B. Measures of Licensing

Source: BEA

1. Micro Survey (BE-93)
 - Licensing Receipts & Payments
2. Micro Survey (BE-10)
 - Firm Attributes (e.g. production, sales, employment, taxes, capital, R&D, . . .)

te: The statistical analysis of firm-level data on international licensing transactions is conducted at the International Investment Division, Bureau of Economic Analysis, United States (US) Department of Commerce under arrangements that maintain confidentiality requirements. The views expressed are those of the authors and do not reflect official views of the US Department of Commerce.

Sample Statistics:

- Royalty & Licensing Fees received by U.S. parent firms from abroad for use of intangible assets.

	Year 1999 <i>(in real billions, US dollars)</i>	From Affiliated	From Unaffiliated
All Countries	\$33.4	72.6%	27.4%
Developed	\$26.7	74.5%	25.5%
Developing	\$6.7	64.8%	35.2%

Top Sources of U.S. Licensing Income:

■ Developed Economies

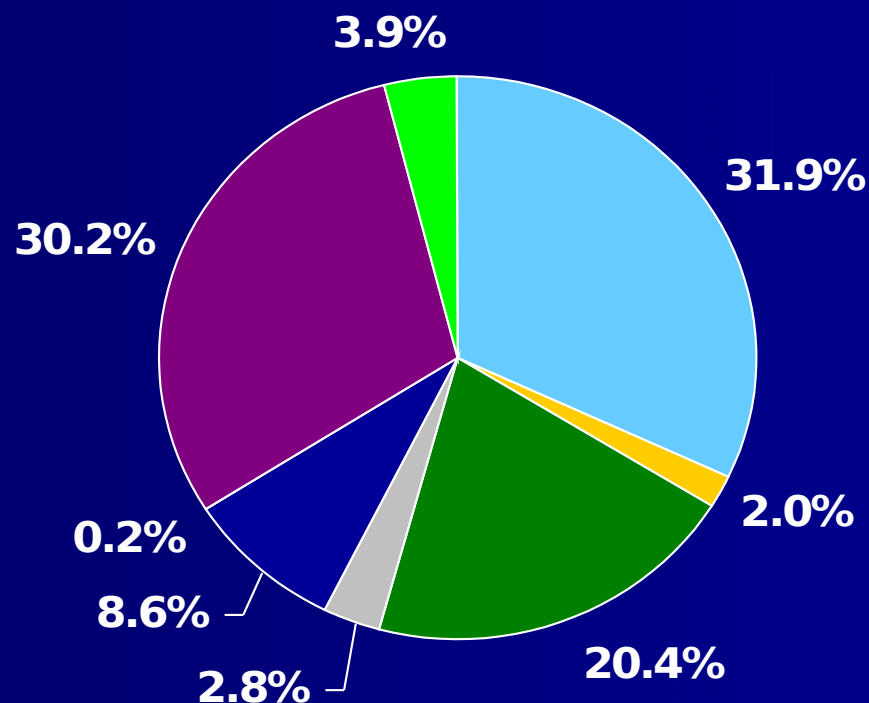
Japan	20.6%
Germany	12.7%
UK	11%
S. Korea	6.2%
France	6.1%
Canada	4.5%

■ Developing Economies

Brazil	2.3%
Mexico	1.8%
S. Africa	1.1%
Venezuela	0.9%
China	0.82%
Argentina	0.8%

Figures are for Year
1999

Royalty & Licensing Fees by Type of Intangible Asset



4) Empirical Analysis

Three Main Hypotheses:

- A. The strength of intellectual property rights does influence the incentive to license, depending on:
 - Type of intellectual property right.
 - Type of intangible asset
 - Industry
 - Level of economic development of the partner country.
- A. Both statutory laws & implementation of laws matter.
- B. IPRs affect the composition:
 - Among alternative channels of technology transfer
 - Between affiliated and unaffiliated licensing

Regression Model:

$$\text{Log (Licensing}_{i,n,t}) = \alpha_0 + \alpha_1 \text{Log (IPR}_{n,t}) \\ + \alpha_2 \text{Log (Z}_{i,t}) + \varepsilon_{i,n,t}$$

where $i = 1, \dots, I$ firms,
 $n = 1, \dots, N$ countries,
 $t = 1, \dots, T$ time periods

Highlights of Results:

- IPR is statistically significant determinant of arms-length licensing
 - Even after controlling for “enforcement in practice”
 - Elasticity = 0.4%
- Patent rights most important; copyright and trademark protections are not statistically significant in **pooled sample**.

- In split samples, copyright strength **positively** affects licensing in **developed** markets, & **negatively** in **developing** markets.
- Trademark strength is (weakly) associated with a reduction in licensing (in either market).
- Patent rights positively associated with licensing in both developed & developing countries.
- IPR measures robust to inclusion of alternative indicators: e.g. country risk, economic freedom, rule of law, corruption, and trade restrictiveness.

- By type of intangible asset,
 - Copyrights are positively associated with licensing of books, (mildly) negatively with franchise assets;
 - Patent rights are positively associated with licensing of industrial processes, general use software, pre-recorded performances, and trademarks;
 - Trademark rights have a positive influence on performances, neutral on trademark licensing.

- By industry,

- Subject to “Classification issues”, the results show:

- Patent rights positively associated with licensing in Electronics & Electrical, Transportation, Services, Financial (mildly).
 - Effective enforcement especially important in Chemicals, Services, and Wholesale (mildly).
 - Copyrights important to Chemical licensing.
 - Trademark rights have negative influence on Chemical, Electrical, and Metals licensing.
 - Licensing in Machinery not significantly affected by any type of IPR.

Composition of Technology Transfer:

- Stronger patent protection favors arms-length licensing relative to FDI & Exports (in developed & developing markets).
- Stronger copyrights favor arms-length **licensing** in **developed** markets & **FDI** in **developing** markets.
- Stronger trademark protection favors exports relative to licensing in developing markets.
- Higher R&D intensity favors FDI & exports relative to licensing (in both markets).

Composition: Affiliated vs. Unaffiliated Parties

- Patent rights and trademark protection have no significant influence on share of unaffiliated licensing in total.
- Stronger copyrights and effective enforcement favor unaffiliated licensing in developed countries.
- IPRs don't seem to affect this composition in developing countries.
- Increased **R&D intensity** favors affiliated licensing.
- Expansion in **Sales** favors unaffiliated licensing.

5) Policy Implications

- Would IP reform stimulate technology transfer (via licensing) to developing countries?
 - Qualified Yes:
 - From stronger patent rights and enforcement effectiveness (but not necessarily from stronger copyrights & trademark protection).
 - Other complementary factors required (e.g. investment climate, market size, and governance).

- How should licensing flows to developed countries be expanded?
 - Recall Article 66.2 (TRIPS), regarding obligations of developed country governments vis-à-vis technology transfer to developing countries.
 - Two hurdles to public sector support:
 - **Economic**
 - *To what extent is there private market failure?*
 - **Political**
 - *Will there be domestic political opposition?*
- Global IP reform should emphasize the mutual benefits and mutual sharing of costs between “North and South”.