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Measuring Global Patent Protection

The world economy is undergoing major technological revolutions (in the fields, for example, of pharmaceuticals, biotechnology, and digital technology), revolutions which no doubt are having significant economic and social impacts. A key factor influencing these activities is patent protection. Currently, countries vary in their provision of patent rights: some provide very strong patent protection, others none whatsoever. Not all recognize the importance of patent rights to innovation, nor have the capacity to provide the legal infrastructure for adequate protection. Thus far, researchers, businesspeople, and policymakers have only been able to express their *qualitative* views about the strength of a nation's patent regime. Consequently it was not easy to compare the patent regimes of different countries, or to evaluate whether a patent regime strengthened or weakened over time. In a study co-authored with Juan C. Ginarte and extended with Ramya Mahadevanvijaya, I provide *quantitative* ratings of the strength of the patent regimes of 120 nations, from 1960-1995.[1] (Table 1 shows the ratings for 1970, 1990, and 1995.) The studies both describe how the ratings or indexes were constructed, and examine factors that determine how strongly nations will provide patent protection. The following is a summary.

Table 1: Global Patent Protection Levels

	1970	1990	1995
Algeria	3.38	3.38	3.38
Angola	0.00	0.00	1.65
Argentina	2.26	2.26	3.20
Australia	2.90	3.32	3.86
Austria	3.48	4.24	4.24
Bangladesh	1.99	1.99	1.99
Belgium	3.38	3.90	3.90
Benin	2.52	2.86	2.86
Bolivia	1.98	1.98	1.98
Botswana	1.70	1.90	1.90
Brazil	1.64	1.85	3.05
Bulgaria	—	—	2.57
Burkina Faso	2.24	2.24	2.24
Burma	0.00	0.00	0.00
Burundi	2.52	2.86	2.86
Cameroon	2.24	2.57	2.57
Canada	2.76	2.76	3.24
Central African Republic	2.24	2.57	2.57
Chad	2.38	2.71	2.71
Chile	2.41	2.41	2.74
Colombia	1.62	1.12	3.24
Congo	2.24	2.57	2.57
Costa Rica	1.76	1.47	1.47
Cyprus	2.24	2.24	2.24
Czech Republic	—	—	3.19
Denmark	2.80	3.90	3.71
Dominican Republic	2.41	2.41	2.40
Ecuador	1.66	1.54	2.71
Egypt	1.99	1.99	1.99
El Salvador	2.19	2.19	2.53
Ethiopia	0.00	0.00	0.00
Fiji	2.01	2.01	2.61

The index was constructed by examining national patent laws. The index of patent rights ranges from 0 to 5, with higher numbers reflecting stronger protection levels. The value of the index is obtained (per country, per time period) by aggregating scores in five equally-weighted categories: (1) extent of coverage, (2) membership in international patent agreements, (3) provisions against loss of protection, (4) enforcement mechanisms, and (5) duration. The score in each category ranges from 0 to 1, and reflects the extent of legal features in that category available in a particular country at a particular time. For example, a higher score for enforcement indicates that a country has more mechanisms for enforcing patent laws. A higher score for duration indicates that patentees are protected for a longer period of time (up to a maximum score of 1.0 for 20 years' protection from the date of filing). A higher score for coverage indicates that more kinds of knowledge count as patentable subject matter (e.g., pharmaceuticals). A higher score for provisions against loss of protection indicates that the country does not issue compulsory licensing or revoke rights. Finally, the more patent treaties to which a nation is a signatory, the more it shows a willingness to provide national, nondiscriminatory treatment of foreign patent rights.

What types of countries provide strong patent protection? The results show that the more developed economies provide stronger protection. However, a deeper analysis shows it is not the level of

Finland	2.14	2.95	4.19
France	3.24	3.90	4.04
Gabon	2.24	2.57	2.57
Germany	3.09	3.71	3.86
Ghana	2.37	2.90	2.90
Greece	2.46	2.32	2.32
Grenada	1.70	1.70	1.70
Guatemala	1.08	1.08	1.08
Guyana	1.42	1.42	1.42
Hong Kong	2.04	2.57	2.57
Haiti	3.19	3.19	3.19
Honduras	2.05	1.76	1.76
Hungary	—	—	3.75
Iceland	2.12	2.12	2.12
India	1.42	1.48	1.17
Indonesia	0.33	0.33	2.27
Iran	2.38	2.38	2.38
Iraq	2.13	2.46	2.46
Ireland	2.99	2.99	2.99
Israel	3.57	3.57	3.57
Italy	3.32	4.05	4.19
Ivory Coast	2.52	2.52	2.52
Jamaica	2.86	2.86	2.86
Japan	3.32	3.94	3.94
Jordan	1.52	1.86	1.33
Kenya	2.37	2.57	2.91
Korea	2.94	3.94	3.94
Liberia	2.19	2.19	2.19
Lithuania	—	—	2.57
Luxembourg	2.71	3.05	3.05
Madagascar	1.52	1.86	2.28
Malawi	2.70	3.24	3.24
Malaysia	2.37	2.37	2.84
Mali	1.90	2.57	2.57
Malta	1.89	1.89	1.89
Mauritania	2.24	2.57	2.57
Mauritius	2.56	2.89	2.89
Mexico	1.99	1.63	2.52
Morocco	2.38	2.38	2.38
Mozambique	0.00	0.00	0.00
New Zealand	3.18	3.32	3.86
Nepal	2.52	2.52	2.52
Netherlands	3.61	4.24	4.24
Nicaragua	0.92	0.92	2.24
Niger	2.24	2.24	2.24
Nigeria	3.05	3.05	3.05
Norway	2.80	3.29	3.91
Papua New Guinea	0.00	0.00	0.00
Pakistan	1.99	1.99	1.99
Panama	2.41	2.41	3.53
Paraguay	1.80	1.80	2.46
Peru	1.31	1.02	2.37

development per se that influences the provision of patent rights but rather the determinants of economic development, such as research and development (R&D), market freedom, and openness. Once these are controlled for, a nation's income level is not important. An even deeper analysis shows that R&D activities encourage richer economies to provide strong patent rights but do not encourage poorer economies to do so. One reason is that most of the R&D of poorer economies is public (or government-sponsored). The output of this type of R&D is not likely to be subject to patent claims, but rather to be public property. Second, some of the R&D of poorer economies, if not much of it, is likely to be imitative. The more of that type of R&D, the less stringent patent protection would be.

The finding that R&D does not matter for the poorer economies suggests that there is a *critical* size of a research sector, above which there is sufficient interest on the part of authorities to provide patent rights and below which there is not. This would be plausible if there were large set-up costs to establishing a patent system, in which case it would take a sufficiently large R&D sector to generate enough innovative activity to make an investment in the system worthwhile. Thus, the results need not imply that R&D does not matter to the patent rights of the poorer economies, only that it matters if R&D is large enough.

That there is a "critical R&D size effect" also has some policy relevance. It suggests at the international level that efforts be directed toward fostering a significant research base in countries where patent protection levels are low. Countries that conduct significant innovative research are more likely to have vested interests in seeing patent rights respected. It is this fact that international negotiations should try to exploit. For example, in exchange for research collaboration or assistance, the weaker patent rights nations would strengthen their regimes. Current efforts to pressure them to strengthen their regimes are not likely to work unless their lack of motivation or incentives to strengthen are addressed.

Note

Philippines	2.67	2.67	2.66
Poland	—	—	3.23
Portugal	1.98	1.98	2.98
Romania	—	—	2.71
Russia	—	—	3.04
Rwanda	2.52	2.86	2.86
South Africa	3.37	3.57	3.57
Sierra Leone	2.52	2.52	2.52
Saudi Arabia	2.05	2.05	2.05
Senegal	2.24	2.57	2.57
Singapore	2.37	2.57	3.91
Slovak Republic	—	—	3.19
Somalia	1.80	1.80	1.80
Spain	3.29	3.62	4.04
Sri Lanka	2.60	3.12	3.12
Sudan	2.86	3.52	3.52
Swaziland	2.19	2.19	2.19
Sweden	2.80	3.90	4.24
Switzerland	3.14	3.80	3.80
Syria	2.46	2.46	2.46
Tanzania	2.70	2.90	2.90
Thailand	1.51	1.85	2.24
Togo	2.24	2.24	2.24
Trinidad & Tobago	3.01	3.01	3.01
Tunisia	1.90	1.90	1.90
Turkey	1.80	1.80	1.79
United Kingdom	3.04	3.57	3.57
USA	3.86	4.52	4.86
Uganda	2.37	2.57	2.57
Ukraine	—	—	3.04
Uruguay	2.26	2.26	2.26
Venezuela	1.35	1.35	2.75
Vietnam	—	—	3.13
Zaire	2.52	2.86	2.86
Zambia	3.52	3.52	3.52
Zimbabwe	2.37	2.90	2.90

Notes: — indicates not available; index values range from 0 (weakest) to 5 (strongest).

1J.C. Ginarte and W.G. Park (1997), "Determinants of Patent Rights: A Cross-National Study," *Research Policy*, vol. 26, pp. 283-301, which rates 120 countries from 1960-90; and R. Mahadevanvijaya and W.G. Park (1999), "Patent Rights Index: Update," forthcoming, which adds 10 more countries (i.e. former socialist economies) and updates the index to 1995.

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