

## Chapter 2: Index of Patent Rights

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In Chapter 4: Intellectual Property and Patent Regimes of *Economic Freedom of the World: Annual Report 2001*, we presented and discussed an index of patent rights for various countries for the periods, 1960 to 1975, 1975 to 1990, and 1995. In this chapter, we add to the index values for the year 2000; these are based on new releases of legislative texts by various countries. Since the chapter in the earlier edition discussed patent regimes and defined concepts at some length, this chapter will be brief. First, it will review briefly how the index is constructed; second, it will present the new index values; third, it will compare the patent rights index to other indexes (such as the *Economic Freedom of the World* (EFW) index and the intellectual property ratings of the *Global Competitiveness Report*); finally, it will conclude with a discussion of the relationship between patent rights and economic freedom. A question of interest has been whether patent protection is negatively or positively associated with economic freedom. The purpose of the ensuing discussion is not to provide a definitive answer but to help frame the debate as, thus far, the issue has not been systematically and rigorously addressed.

### How the Index is constructed

Table 1 reproduces the outline of the index and scoring method. The index is based on five categories: (1) coverage (the subject matter that can be patented); (2) duration (the length of protection); (3) enforcement (the mechanisms for enforcing patent rights); (4) membership in international patent treaties; and (5) restrictions or limitations on the use of patent rights. For each of these categories, a country is given a score (ranging from 0 to 1) indicating the extent to which a country is strong in that aspect. For example, a score of 1 for duration indicates that a country provides protection for the full length of time that was established as an international standard (e.g., 20 years from the date of patent application). A score of 1 for the restrictions category indicates that a country does not

impose limitations on the patent right, such as compulsory licensing. In certain countries, a technology deemed important to national welfare or national security may be made widely available by requiring (or compelling) the proprietary owner of the technology to license the technology to third parties. The overall score for patent rights is the unweighted sum of the scores of the five individual categories. The maximum potential score is, therefore, 5. This should not be interpreted as maximum (potential) strength but rather as scoring perfectly on the *minimum* international standards set by international patent treaties.

### New Values for Year 2000

Table 2 provides the values of the patent index for year 2000 as well as a breakdown of the values by category. Most countries score high on category (2), duration, as many countries have recently become signatories to international treaties on intellectual property rights. Consequently, there is less variation in duration; future indexes should explore the “scope” (or breadth) of protection rather than the length. There is also relatively less variation in category (4), membership. This suggests the need (in future indexes) to incorporate new (and important) patent treaties that have recently entered into force or are about to do so (e.g., the *Patent Law Treaty* of the World Intellectual Property Organization).

Most of the variation in patent rights comes from categories (1) coverage, (3) enforcement, and (5) restrictions. Many countries, both developed and developing, have not found it easy to eliminate compulsory licensing, perhaps because this is a policy instrument that enables a government to exercise leverage over the direction of (local) technological development. There are clauses in international treaties that allow governments to use compulsory licensing in the event of national emergencies (e.g., health issues). Overall, the United States has the strongest patent regime, followed by Austria and Germany.

## Table 1: Index of Patent Rights—Categories and Scoring Method

The Index consists of the following five categories and assigns the following values for each criteria:

(1) Coverage (COV)	Available	Not Available
Patentability of pharmaceuticals	1/7	0
Patentability of chemicals	1/7	0
Patentability of food	1/7	0
Patentability of plant and animal varieties	1/7	0
Patentability of surgical products	1/7	0
Patentability of microorganisms	1/7	0
Patentability of utility models	1/7	0
(2) Duration of Protection (DUR)	Full	Partial or No Protection
—where <i>full</i> duration is 20 years from the date of application (or 17 years from the date of grant, for grant-based patent systems) and <i>f</i> equals the duration of protection as a <i>fraction</i> of the full duration.	1	$0 < f < 1$
(3) Enforcement (ENF)	Available	Not Available
Preliminary Injunctions	1/3	0
Contributory Infringement	1/3	0
Burden-of-Proof Reversal	1/3	0
(4) Membership in International Treaties (MEM)	Available	Not Available
Paris Convention and Revisions	1/3	0
Patent Cooperation Treaty	1/3	0
Protection of New Varieties (UPOV)	1/3	0
(5) Restrictions on Patent Rights (RIG)	Does Not Exist	Exists
“Working” Requirements	1/3	0
Compulsory Licensing	1/3	0
Revocation of Patents	1/3	0

Notes: Each category (except for duration) consists of a number of legal criteria relevant to that category. Each category (including duration) is scored out of 1. Thus the Index of Patent Rights overall varies from 0 to 5. All criteria (or patent law features) within a category are weighted equally so that the value of each criteria is simply equal to its “share” in the category.

Mozambique has the weakest patent regime. Korea is among the strongest patent regimes—after decades of providing weak levels of protection—but it is unclear whether its economic growth and development can be attributed in any way to changing attitudes and policies with respect to patent rights or whether an interest in patent protection developed only after its economic development produced a wealth of intangible assets for its nationals.

Table 3 compares the index of patent rights for the year 2000 to that for the year 1995. It also compares them to the rating of intellectual property rights in the *Global Competitiveness Report* (which is based on surveys of firms situated in different economies) and to the EFW index for 1999.<sup>1</sup> Column A reproduces the patent index values for 2000, shown in the last column of Table 2; column B shows the values for 1995; column C shows the percentage change in the patent index value from 1995 to 2000. Overall, the patent rights index for 2000 is highly correlated with that for 1995. There have been relatively few recent changes in patent regimes across countries. However, large percentage changes in the patent rights index have occurred, primarily for less-developed economies or economies that have historically had weak patent regimes (e.g., Indonesia, China, India, Nicaragua, and Turkey). This “convergence” in patent regimes is the result of international treaties (such as the *Agreement on Trade Related Intellectual Property Rights (TRIPS)* of the World Trade Organization), which aimed to strengthen laws in regions (largely developing countries) where patent rights were weak. Thus, Table 3 shows those economies “catching up” to the minimum (patent law) standards that make up effective and adequate protection. Table 3 indicates, however, that there still are several countries whose patent regimes are relatively weak (below scores of 2.5). International treaties have provided extensions for poorer economies that need to adopt new patent laws slowly and it may take some time before full convergence to the “minimum” international standards takes place.<sup>2</sup>

#### **The Index of Patent Rights and the *Global Competitiveness Report***

Column D of Table 3 reproduces ratings from the *Global Competitiveness Report* (GCR).<sup>3</sup> The main difference between the GCR ratings and the patent rights index discussed in this chapter is that the former is based on surveys of opinions or experiences of firms or individuals, whereas the latter is based on patent

laws. Another key difference is that the GCR ratings cover intellectual property as a whole. Subjects are asked to rate the intellectual property regime of each country, which can cover quite a broad spectrum of issues—from patent rights to trademarks to copyrights to geographic indications (which certify that a product was made in a certain place, such as Champagne). The index we provide here focuses strictly on patent rights. In earlier work, Park (2001) finds quite a bit of diversity among intellectual property rights: some countries strongly protect patent rights while weakly protecting copyrights and trademarks, and vice versa. The theoretical literature is also divided on the relative merits of stronger patent rights and other kinds of intellectual property rights; that is, a case might be made for stronger patent rights in terms of stimulating innovation and technological spill-overs whereas a case might be made for moderate copyrights to stimulate follow-on creativity (e.g., building upon past work).

Despite these differences between the GCR ratings and the patent rights index, Table 3 reports a remarkably high simple correlation between the GCR ratings and the patent rights index for 1995 and 2000. The correlations are about 0.8. This suggests a relatively strong match between statutory levels of patent protection (i.e., laws on the books) and perceived levels of protection for intellectual property among practitioners. A common criticism of the patent rights index is that it does not capture actual experiences. Measuring actual experiences (or actual practice) using surveys or questionnaires can also be subject to bias and other criticisms. Nonetheless, comparisons between measures of experience and the patent rights index tend to show some degree of consistency.<sup>4</sup>

#### **The Index of Patent Rights and the EFW Index**

Column E reproduces the EFW index for 1999. The correlation between the EFW index and the patent rights index (or the GCR ratings) is positive. Economic freedom and patent rights tend largely to “move together” (though, of course, in some situations economic freedom is relatively high where patent protection levels are low and vice versa). Needless to say, correlations suggest very little about *causality*. For instance, they do not indicate whether stronger patent protection leads to (or reduces) economic freedom or whether economic liberalization helps to strengthen or weaken patent laws. These are important issues to address in light

of the fact that the benefits of protecting intellectual property often come at some cost, such as deviations from marginal cost pricing.

### Patent Rights and Economic Freedom

What are our prior beliefs? Is patent protection a hindrance to economic freedom or does it help enhance economic freedom? If patent rights do reduce economic freedom, does this render patent protection undesirable? Does it imply a trade-off between economic freedom and technological progress? These are difficult issues to address informatively given the lack of formal research on these issues (although a first try at some causality tests are reported in Chapter 4 of the *Economic Freedom of the World: Annual Report 2001*).

It would be useful to clear up a few matters. First, questions of whether patent rights are desirable are ill-posed for two reasons; the desirability of patent rights is not an “either-or” issue. It is well recognized that patent protection brings *both* social benefits and costs. Thus, the issue more properly is the appropriate *degree* of patent protection (or the optimal level of patent protection). The social benefits or costs of patent protection are often cast in terms of “utility”—the effects on productivity growth, innovation, technological diffusion and so forth—or of “morality”—the rights of the individual inventor versus that of the community and so forth. Secondly, however desirable a system of patent rights may be, there exist reasonable disagreements about the manner in which patent rights should be allocated or about the efficiency of patent systems in practice. Thus, it is useful to distinguish between the *principles* of patent rights and the *practice*. Proponents of patent rights may also be proponents of reform who seek changes or alternatives to current practice.<sup>5</sup>

A second set of matters to clear up concerns misconceptions about the nature of the monopoly power that patent rights create.<sup>6</sup> First, the patent right is the right to *exclude* others from exploiting the protected invention. This right is transient. It has a maximum life span and the right must be periodically renewed if it is not to expire. Second, some stylized facts: the vast

majority of patents granted turn out to be economically worthless (*i.e.*, not commercially viable). Thus, a vast majority of patents granted do no real good or harm on industries other than waste the resources of the patent office (for examining patent applications). Of those patents that are valuable, not all of them last the full statutory duration. The majority of those patent rights last fewer than seven or eight years. By that time, the value of a patent may have diminished because either the invention’s purpose or usefulness has a finite life or a new and better technology has displaced it. Thirdly, with the exception of certain chemical or pharmaceutical patents, the right to exclude extends not to an entire industry or final product but to particular parts or components of products. The more appropriate model for the market structure is *monopolistic competition* rather than monopoly. That is, within an industry, there are many competing “varieties” (represented by various inventions). These inventions compete because they are close substitutes. They may be functionally similar (*e.g.*, represent different ways of operating a machine or cleaning stains, and so forth). There is free entry and exit in the sense that other inventors are free to try to develop a new alternative variety (as long as it does not infringe upon existing patent rights). Moreover, new inventions also compete with old inventions. Consumers need not purchase Windows XP™ if the price does not justify the increase in quality over Windows 98™. Thus, while patent rights create (temporary) deviations from marginal cost pricing (in order to allow the inventor to recoup the fixed costs for research and development of the new variety), the view that they create pure monopolies is a mischaracterization.

Thus, productive debates on the relationship between economic freedom and patent rights should take into account the various institutional aspects of the patent system and be wary of certain misconceptions. It would be useful if future work could also go beyond the raw correlations and study the underlying *structural* relationship between economic freedom and patent systems.

## Notes

- 1 See Gwartney and Lawson 2001, Exhibit 1-2, p. 9.
- 2 It should be noted that patent rights may become stronger than, or exceed, those “minimum” standards as countries recognize certain new technological areas as patentable subject matter (e.g., genetic innovations, internet innovations, financial innovations, databases, and business methods). Currently these new technological areas are a subject of much controversy: for example, should they become proprietary and do they constitute “inventions” per se?
- 3 See World Economic Forum 2000, variable 3-11.
- 4 See Park 2002.
- 5 See, for example, AIPLA 1999 for discussions of how (and whether) patent systems should be reformed.
- 6 For more details, see Park 2000.

## References

- AIPLA (1999). *Fourth Symposium on Patent Cost Reduction, The Hague, Netherlands*. Washington, DC: American Intellectual Property Law Association.
- Gwartney, James, and Robert Lawson (with Walter Park and Charles Skipton) *Economic Freedom of the World: Annual Report 2001*. Vancouver, BC: The Fraser Institute.
- Park, Walter G. (2000). Patent Rights and Economic Freedom: Friend or Foe? Working paper. Department of Economics, American University.
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- World Economic Forum (2000). *Global Competitiveness Report 2000*. Oxford: Oxford University Press.

**Table 2: Index of Patent Rights, Year 2000**

	Coverage (COV)	Duration (DUR)	Enforcement (ENF)	Membership in International Treaties (MEM)	Protection from Restrictions on Patent Rights (RIG)	Total
Argentina	1.00	1.00	0.67	0.67	0.00	3.33
Australia	0.86	1.00	1.00	1.00	0.33	4.19
Austria	0.71	1.00	1.00	1.00	1.00	4.71
Bangladesh	0.86	0.80	0.00	0.33	0.67	2.66
Belgium	0.71	1.00	1.00	1.00	0.33	4.05
Botswana	0.57	1.00	0.00	0.33	0.33	2.24
Brazil	0.71	1.00	0.67	0.67	0.00	3.05
Bulgaria	0.57	1.00	0.33	1.00	0.33	3.24
Canada	0.57	1.00	0.67	1.00	0.67	3.90
Chad	0.71	1.00	0.33	0.67	0.33	3.05
Chile	0.86	0.88	0.33	0.33	1.00	3.41
China	0.14	1.00	0.33	0.67	0.33	2.48
Colombia	0.57	1.00	0.67	0.67	0.33	3.24
Czech Rep.	0.86	1.00	0.00	1.00	0.67	3.52
Denmark	0.86	1.00	0.67	1.00	0.67	4.19
Ecuador	0.71	1.00	0.67	0.67	0.67	3.71
Egypt	0.71	0.75	0.67	0.33	0.00	2.46
Ethiopia	0.00	0.00	0.00	0.00	1.00	1.00
France	0.71	1.00	1.00	1.00	0.33	4.05
Germany	0.86	1.00	1.00	1.00	0.67	4.52
Greece	0.86	1.00	0.67	0.67	0.00	3.19
Grenada	0.71	0.70	0.00	0.67	0.33	2.41
Guatemala	0.29	0.75	0.33	0.33	0.00	1.70
Guyana	0.43	0.80	0.00	0.33	0.33	1.90
Hong Kong	0.57	1.00	0.33	0.67	0.33	2.90
Hungary	0.71	1.00	0.67	1.00	0.33	3.71
India	0.14	0.70	0.33	0.67	0.33	2.18
Indonesia	0.57	0.70	0.33	0.67	0.00	2.27
Ireland	1.00	1.00	0.33	1.00	0.67	4.00
Israel	0.71	1.00	0.67	1.00	0.67	4.05
Italy	1.00	1.00	1.00	1.00	0.33	4.33
Japan	0.86	1.00	1.00	1.00	0.33	4.19
Jordan	0.86	0.80	0.33	0.33	0.67	2.99
Kenya	0.71	1.00	0.67	0.67	0.00	3.05

Table 2 continued: Index of Patent Rights, Year 2000

	Coverage (COV)	Duration (DUR)	Enforcement (ENF)	Membership in International Treaties (MEM)	Protection from Restrictions on Patent Rights (RIG)	Total
Korea	0.86	1.00	1.00	0.67	0.67	4.19
Madagascar	0.86	0.75	0.33	0.67	0.33	2.94
Mexico	0.86	1.00	0.33	0.67	0.00	2.86
Mozambique	0.00	0.00	0.00	0.00	0.00	0.00
Netherlands	0.71	1.00	1.00	1.00	0.67	4.38
New Zealand	1.00	1.00	0.67	1.00	0.33	4.00
Nicaragua	0.00	0.59	0.00	0.33	0.67	1.50
Norway	0.57	1.00	0.67	1.00	0.67	3.90
Pakistan	0.86	0.80	0.00	0.00	0.33	1.99
Peru	0.71	1.00	0.33	0.33	0.33	2.71
Poland	0.57	1.00	0.33	1.00	0.33	3.24
Romania	0.71	1.00	0.00	0.67	0.33	2.71
Russia	0.86	1.00	0.33	1.00	0.33	3.52
S. Africa	0.71	1.00	0.67	1.00	0.67	4.05
Senegal	0.57	1.00	0.33	0.67	0.33	2.90
Singapore	0.71	1.00	0.67	0.67	1.00	4.05
Somalia	0.86	0.75	0.00	0.00	0.67	2.27
Spain	0.71	1.00	1.00	1.00	0.33	4.05
Sri Lanka	0.71	0.88	0.33	0.67	1.00	3.60
Sweden	0.71	1.00	1.00	1.00	0.67	4.38
Switzerland	0.71	1.00	0.67	1.00	0.67	4.05
Thailand	0.57	1.00	0.67	0.00	0.00	2.24
Togo	0.57	1.00	0.33	0.67	0.33	2.90
Tunisia	0.57	1.00	0.00	0.33	0.33	2.24
Turkey	0.86	1.00	0.00	0.67	0.33	2.86
United Kingdom	0.86	1.00	0.67	1.00	0.67	4.19
United States	1.00	1.00	1.00	1.00	1.00	5.00
Venezuela	0.57	1.00	1.00	0.33	0.00	2.90
Zimbabwe	0.57	1.00	0.33	0.67	0.67	3.24

**Table 3: Summary Ratings for Patent Rights 2000 and Other Indexes**

	Index of Patent Rights, 2000	Index of Patent Rights, 1995	% Change, 1995-2000	Intellectual Property, <i>Global Competitiveness Report 2000</i>	Index for 1999, <i>Economic Freedom of the World: 2001 Annual Report</i>
Argentina	3.33	3.19	4.5	3.72	8.3
Australia	4.19	3.86	8.6	8.27	8.5
Austria	4.71	4.57	3.1	8.65	8
Bangladesh	2.66	2.32	14.3	2.02	4.8
Belgium	4.05	3.90	3.7	7.57	7.9
Botswana	2.24	1.90	17.5		6.9
Brazil	3.05	3.05	0.0	5.08	5.1
Bulgaria	3.24	2.57	26.0	3.35	5.9
Canada	3.90	3.57	9.3	7.98	8.2
Chad	3.05	2.71	12.3		4.7
Chile	3.41	3.07	10.8	5.27	8
China	2.48	1.55	59.8	3.22	5.8
Colombia	3.24	2.57	25.9	3.28	5.8
Czech Rep.	3.52	3.19	10.5	5.58	6.6
Denmark	4.19	4.05	3.4	8.82	8
Ecuador	3.71	2.71	36.8	2.98	6.4
Egypt	2.46	1.99	24.0	5.17	6.8
Ethiopia	1.00	0.00			
France	4.05	4.05	0.0	9.40	7.5
Germany	4.52	3.86	17.3	8.84	8
Greece	3.19	2.65	20.2	4.83	7.3
Grenada	2.41	1.70	41.6		
Guatemala	1.70	1.08	57.1	2.18	6.7
Guyana	1.90	1.42	33.6		6.4
Hong Kong	2.90	2.57	13.0	6.30	9.4
Hungary	3.71	3.37	10.2	5.53	7.1
India	2.18	1.51	44.5	3.27	5.3
Indonesia	2.27	1.24	83.5	3.13	6.2
Ireland	4.00	3.32	20.3	7.00	8.5
Israel	4.05	3.57	13.3	6.53	6.7
Italy	4.33	4.19	3.4	7.80	7.8
Japan	4.19	3.94	6.3	7.55	7.9
Jordan	2.99	2.19	36.5	6.05	6.8
Kenya	3.05	2.90	4.9		6.3
Korea	4.20	4.20	0.0	5.00	7.1
Madagascar	2.94	2.27	29.3		4.4
Mexico	2.86	2.86	0.0	4.38	6.5
Mozambique	0.00	0.00	0.0		
Netherlands	4.38	4.38	0.0	9.09	8.4
New Zealand	4.00	3.86	3.7	7.15	8.9
Nicaragua	1.59	0.92	72.3	2.08	7.5
Norway	3.90	3.90	0.0	7.20	7.8
Pakistan	1.99	1.99	0.0		5
Peru	2.71	2.71	0.0	3.33	7.6



**Table 3 continued: Summary Ratings for Patent Rights 2000 and Other Indexes**

	Index of Patent Rights, 2000	Index of Patent Rights, 1995	% Change, 1995-2000	Intellectual Property, <i>Global Competitiveness Report 2000</i>	Index for 1999, <i>Economic Freedom of the World: 2001 Annual Report</i>
Poland	3.24	2.90	11.7	4.63	5.7
Romania	2.71	2.71	0.2	4.10	3.8
Russia	3.52	3.04	15.9	1.88	3.9
S. Africa	4.05	3.57	13.2	5.82	7
Senegal	2.90	2.57	13.0		4.8
Singapore	4.05	3.90	3.7	7.62	9.3
Somalia	2.27	1.80	26.5		
Spain	4.05	4.05	0.0	7.15	7.6
Sri Lanka	3.60	3.12	15.3	3.50	5.8
Sweden	4.38	4.24	3.4	8.08	7.9
Switzerland	4.05	3.91	3.6	9.17	8.5
Thailand	2.24	2.24	0.0	4.42	6.8
Togo	2.90	2.57	13.0		4.5
Tunisia	2.24	1.90	17.5		6
Turkey	2.86	1.80	58.9	3.43	6.2
United Kingdom	4.19	3.57	17.3	8.44	8.8
United States	5.00	4.86	2.9	9.10	8.7
Venezuela	2.90	2.90	0.0	3.40	6.1
Zimbabwe	3.24	2.90	11.5	3.23	5.4
<b>Mean</b>	3.22	2.86	17.61	5.63	6.84
<b>Std Dev</b>	0.95	1.06	21.33	2.27	1.39
<b>Min</b>	0.00	0.00	0.00	1.88	3.80
<b>Max</b>	5.00	4.86	100.00	9.40	9.40

**Correlation Matrix:**

	Index of Patent Rights, 2000	Index of Patent Rights, 1995	<i>Global Competitiveness Report</i>	<i>Economic Freedom of the World: 2001 Annual Report</i>
Index of Patent Rights, 2000	1			
Index of Patent Rights, 1995	0.962	1		
<i>Global Competitiveness Report</i>	0.803	0.808	1	
<i>Economic Freedom of the World: 2001 Annual Report</i>	0.522	0.571	0.729	1

