GLOBAL PROSPECTS FOR THE ROLE OF INTELLECTUAL PROPERTY IN TECHNOLOGY TRANSFER*

ROBERT M. SHERWOOD**

Among other things, Julius Caesar is remembered for saying that all of Gaul is divided into three parts. I alert you to this because my remarks are divided into three parts.

I will offer you *Three Observations*, followed with *Three Predictions*, and end with *Hope for the Future*.

I suppose that for this audience I don't have to work very hard to assert that intellectual property is critical for full-fledged technology transfer. Still, I want to press the thought, particularly, because in this country and a few others, effective intellectual property protection is taken for granted and is, therefore, not usually mentioned in conjunction with discussions of technology transfer.

About twenty years ago, I delivered a paper in Mexico City to the Licensing Executive Society. My theme was "conductivity." I tried to explain the limits imposed on technology transfers by the absence of effective intellectual property protection. To be sure, some technology can be acquired without a willing transfer from its creator. Reverse engineering, imitation and "piracy" have distinct limits as a national strategy; however, the skills gained are less valuable than those honed in creating, rather than

---

* Keynote Address, WIPO-IIPI International Conference, Technology Transfer and Small and Medium-Sized Enterprises, Washington, D.C., Apr. 5, 2001.

** Robert M. Sherwood, an author and consultant, specializes in the economic implications of robust intellectual property protection in developing countries. He has also initiated research into the economic consequences of dysfunctional judicial systems. A selection of his writings is available at <http://www.kreative.net/ipbenefits>.

copying, new technology. Willing transfers tend to offer greater learning for recipients.

More importantly, without effective protection for intellectual property, the recipient of useful technology, however acquired, will often be crippled in efforts to use and advance the technology. Vast quantities of technical knowledge are now freely available from numerous sources, particularly through the Internet. Yet in many countries those who have the ability to obtain that knowledge are commonly reluctant to invest time and money in working it into something useful for fear others will quickly copy their work.

And so, technology tends to flow best where conductivity for its transfer is secured by effective intellectual property systems. This is true not only when the technology originates from proprietary sources, but even when it is freely available.

Let me elaborate this simple thought a bit further. Conductivity, as I am using the term in relation to technology transfer, relies on a mix of intellectual property tools, but most prominently on what is commonly called the "trade secret." This term is not particularly descriptive. Industrial and commercial secrets are a more readily understood concept. In any event, this form of protection is little known in most developing countries.

This may be explained because intellectual property systems in many countries came from a colonial legacy bestowed in the mid- to late-1800s. That was before the guild system broke down in Europe as the industrial revolution matured. Germany, France, England, and Italy today have excellent means to protect against loss of valuable technology when employees depart,[1] but most developing countries did not adjust and still rely on outmoded concepts of employee disloyalty or unfair competition.

Industrial secret protection is typically critical at the start of technology transfer negotiations. Each party needs to know what the other will bring to the table and without some confidence that secrets will not be lost when revealed, negotiation suffers.

---

[1] *See* Christina Moeckel, *Civil Enforcement of Intellectual Property Rights in Germany, France and Italy,* 28 Rev. da ABPI 3-21, (Rio de Janeiro, Brazil, May/June 1997).

So, I hope I have helped to affirm the thought that effective intellectual property protection is critical for best practice in transferring technology.

Now, let me offer my *Three Observations*. The *first observation* is that the Trade-Related Aspects of Intellectual Property Rights ("TRIPS") Agreement[2] is largely irrelevant to what really matters for developing countries.

I base this observation largely on work I did for the Inter-American Development Bank ("IDB") in the mid-1990s. As part of the Bush Initiative, the IDB sought to assess the policy environment for private investment and I was asked to make a diagnostic assessment of the intellectual property systems in eleven countries. From other work, I was able to assess seven more countries' intellectual property systems, for a total of eighteen countries.

To facilitate comparisons among the countries, I adopted a numerical system for assessing investor risk relative to intellectual property protection. On a scale of 100,[3] Brazil's intellectual property system was rated at a 49, Mexico at 69, Argentina at 39, Korea at 74, Guatemala at 13, and so forth.

The result is available in a long English language monograph[4] and a small Spanish language book. You'll find the English version freely available for download from my web site.[5]

As the monograph was being written, the TRIPS Agreement was enacted. Carlos Primo Braga of the World Bank, insisted I rate TRIPS under the same criteria I previously applied to the country systems. I resisted his

---

2 *Agreement on Trade-Related Aspects of Intellectual Property Rights, Annex 1C of the Final Texts of the GATT Uruguay Round Agreements Including the Agreement to Establish the World Trade Organization* (signed Apr. 15, 1994), *International Treaties on Intellectual Property*, 585-618 (Marshall A. Leaffer ed., 2d ed., BNA Books 1997).

3 A score of 100 would indicate a system perfectly free of investor risk. No system achieves such a score, of course, largely because science is movingly so swiftly.

4 Robert M. Sherwood, *Intellectual Property Systems and Investment Stimulation: The Rating Systems in Eighteen Developing Countries*, 37 IDEA 261 (1997).

5 Robert Sherwood, *Selected Writing by Robert M. Sherwood Regarding: Intellectual Property in Developing Countries and Judicial Syste,s and Economic Development* <http://www.kreative.net/ipbenefits> (accessed Jan. 31, 2002).

request at first, then with caveats and reluctance, I found TRIPS rated a 55 on the scale of 100.

To determine the relevance of my findings to economic development, I turned to the empirical studies done by Edwin Mansfield for the World Bank in the early 1990s.[6] A tentative correlation of my results with his indicates different things happen at different levels of intellectual property protection. Specifically, the TRIPS level of protection is probably not sufficiently robust to support local research and development, or even complete manufacturing of sophisticated products. At the TRIPS compliance level, an economy is likely to be characterized by parts manufacture and assembly-line operations.

In my experience on the front lines in over twenty-five developing countries over the last sixteen years, I have found remarkably inventive people in even the poorest of countries. In the coming age of knowledge-driven economies, these people are going to be a highly valuable national resource; more important than Adam Smith's three famous factors of capital, labor, and gold in the ground. Whether this natural resource is wasted or mobilized will depend greatly on whether the national intellectual property system is robust - or merely TRIPS compliant. On my numerical risk assessment scale, a country needs to be at about a seventy to encourage local research and development.

Before I leave my observation that TRIPS is not very relevant to what really matters for developing countries, I would have you recall that TRIPS was forged from heated international trade negotiations between countries, which favored and which opposed intellectual property protection. Not surprisingly, a compromise resulted. The negotiators were not charged with concern for economic development, but only for reduction of trade friction.

When intellectual property was inserted into the trade arena, policy fell into the hands of diplomats. Foreign ministries are good at converting

---

[6] Edwin Mansfield, *Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer, Discussion Paper 19* (International Finance Corporation of the World Bank Group, 1994); Edwin Mansfield, *Intellectual Property Protection, Direct Investment, and Technology Transfer: Germany, Japan, and the United States, Discussion Paper 27*, (International Finance Corporation of the World Bank Group, 1995).

any issue into poker game material. As a result, in many countries, the minister of industry and commerce, or the equivalent, has tended to lose control of intellectual property policy. As I have written elsewhere,[7] the diplomats tend to withhold the intellectual property bargaining chip in error. It is better to analyze intellectual property as part of a country's infrastructure for economic development.

For example, Brazil's trade account suffers because very few Brazilian companies are willing to conduct in-house research to improve their products. Brazil's competitiveness in the global marketplace suffers accordingly. The foreign ministry, nonetheless, holds back on intellectual property system improvement in hopes of obtaining some specific trade concession, such as orange juice exports, to the United States. The trade account would probably improve considerably and much sooner should Brazil upgrade its intellectual property system now rather than wait for the uncertain outcome of impending trade negotiations.

So, I hope this gives you some sense of why I observe that TRIPS is not particularly relevant for economic development in most developing countries.

My *second observation* is that, notwithstanding TRIPS compliance, intellectual property remains largely a fantasy in most developing countries and will remain so for years.

I base this observation on the thought that the judicial systems in perhaps eighty percent of the countries of the world are simply not up to the task of supporting intellectual property rights, much less dealing effectively with other matters.

I don't think I need to elaborate that observation very much. Judicial system weaknesses come in many flavors. Corruption among judges or court officials, political interference with decisions, undue delay, judicial incompetence, and sometimes all of the above, characterize too many national judicial systems.

---

[7] Robert M. Sherwood, *Intellectual Property: A Chip Withheld in Error*, in, *Competitive Strategies for the Protection of Intellectual Property*, 73-84, (Owen Lippert, ed., The Fraser Institute 1999).

Beyond these factors, intellectual property disputes present remarkably difficult issues for which few judicial systems are prepared. In my work for the World Bank and the Inter-American Development Bank, I have routinely offered three suggestions for the improvement of judicial treatment of intellectual property matters. They are partial solutions. However, I'll also describe an approach to a more comprehensive solution.

Judges in most courts need education about intellectual property concepts, but to educate all judges is quite impractical in most countries. A logical approach is to reduce the number of judges needing such attention. The creation of specialized intellectual property courts in developing countries is often mentioned. In my view, this is a mistake. A better approach is to follow the system adopted a few years ago in the Federal Courts of Australia.[8] There, a few judges in each courthouse volunteer or are designated to receive the intellectual property cases. They decide other cases as well, but build up experience and receive focused education in intellectual property matters. The cost of the Australian approach is nominal and caseload management can be flexible.

Education of judges in intellectual property concepts deserves more thought. The usual approach calls on experts to lecture the judges. A number of judges complained to me that often the lecturers simply recite the statutes to them. This is insulting, the judges say, because they are fully capable of reading the statutes for themselves. I have been told repeatedly that they want to know what their decisions will mean, "outside the window," in the real world.

To this end, I'm experimenting in Brazil with a thirty minute "novella" in video format that depicts a real-world patent fight between two Brazilian companies. The parties, faced with a court battle, are shown meeting to settle the dispute. An engineer has transferred from one of the companies to the other, raising questions of industrial trade secret misappropriation. The lawyers urge the parties to settle for a cross-license, but the "mad scientist" owner of the little start-up company is enraged. As the video ends, he storms out of the meeting saying he'd rather die. The audience is left with few answers but with a fascinating exposure to most of the basic concepts of patent litigation and an introduction to the law of

---

[8] *See* Robert M. Sherwood, *Specialized Judicial Arrangements for Intellectual Property*, 36 Rev. da ABPI 38-41, (Rio de Janeiro, Brazil, Sept./Oct. 1998).

industrial trade secrets. Judges in Brazil, from the Supreme Court on down, are eagerly waiting to see the film.

Another partial approach to improving judicial treatment of intellectual property would be to develop a reference catalogue of the tools judges need to effectively defend intellectual property rights. This would include things like precautionary measures, authority to order seizures to preserve evidence, and some description of minimum sanctions with deterrent effects. In most countries, I have found that judges must work with an incomplete assortment of tools. The World Intellectual Property Organization ("WIPO") might serve usefully in creating such a reference catalogue.

A few minutes ago, I promised to describe an approach to a more comprehensive solution to weak judicial system performance. It is an approach which makes no explicit mention of intellectual property but is one from which intellectual property stands to benefit. Several years ago, I wrote a paper with a World Bank economist and a Brazilian diplomat.[9] It asserts that when a judicial system performs poorly, the national economy suffers. We called for research to prove our assertion. Curiously, the economic development literature had almost nothing to say on this issue.

Subsequently, a methodology was devised to measure the negative impact of judicial dysfunction on economic performance. In Brazil, the research showed that the rate of national economic growth shrinks by approximately twenty percent due to judicial inefficiency. Higher numbers have been found in several other countries. In Spain, a comparable study showed that eighty percent or more of the 500 companies surveyed claimed they are rendered non-competitive in the European market because of the difficulties they face with the Spanish judiciary.[10]

This economic damage approach to judicial system assessment does not tell us exactly what to fix in a dysfunctional system, instead, it shifts

---

[9] Robert M. Sherwood, Geoffrey Shepherd and Celso Marcos de Souza, *Judicial Systems and Economic Performance*, <http://www.kreative.net/ipbenefits>; shortened version in 34 QREF 101-116, Special Issue (Summer 1994), http://www.elsevier.nl.

[10] The results of these studies may be available in various monographs from the Tinker Foundation, 55 East 59th Street, New York, NY 10022. The results for Brazil are available in Portuguese in Armando Castelar, org., *Judicario e Economic no Brasil*, (Editora Sumare, Instituto de Estudos Economicos Sociais e Politicos, Sao Paulo, 2000).

judicial reform efforts from being a matter of moral and ethical issues into an economic concern for everyone. Already in Brazil, this fact has changed the terms of the public debate about judicial reform.

My *third observation* is that, notwithstanding a great deal of discourse, we still know alarmingly little about the actual effects of intellectual property on the activity patterns of developing countries.

A good deal of the shouting which has accompanied the negotiating and implementation of the TRIPS Agreement involves speculation about future consequences flowing from changes in intellectual property rules. The level of conjecture has been, and remains, quite high. Empirical studies of effects in developing countries are in short supply. Aside from the Mansfield studies for the World Bank, which I previously mentioned, the literature is quite thin.

Part of the reason for the lack of empirical evidence is few developing countries have seriously upgraded their intellectual property systems. Keith Maskus has produced a valuable book that usefully identifies the multiple ways in which an intellectual property system influences activity.[11] I participated in several early reviews of his research and made the comment then that the book would be premature, precisely because so few countries have changed their intellectual property systems sufficiently to make it worthwhile to search for changes in activity patterns.

Mexico and South Korea do appear to have upgraded their systems enough to warrant serious "before and after" review. I have written a proposal for in depth research in Mexico to discern the effect, if any, which the improved intellectual property system there has had on activity patterns. The proposal is under consideration by the World Bank currently, and I suspect it could serve as a useful activity for cooperation with WIPO and/or the IDB.

We very much need to learn more about the actual effect of intellectual property protection in developing countries. My own view is that robust protection will release a great deal of energy into the economies of many of these countries.

---

[11] Keith E. Maskus, *Intellectual Property Rights in the Global Economy* (Institute for International Economics, 2000).

For the second part of my remarks, I want to offer several *Predictions*.

The *first prediction* is that inventors in many developing countries will ultimately provide the primary momentum to achieve effective intellectual property systems.

In Brazil important inventions are being made, not in the established companies, but in the government research laboratories and by junior university faculty, as well as by start-up companies in biotech and software. At a conference last year in Sao Paulo, I predicted that this surge in inventions will change the political economy of intellectual property and quickly lead to strong local demands for a better intellectual property system.[12] I find that these inventors know something about intellectual property but have many misconceptions, and so I am currently organizing a short course for these inventor communities regarding how best to commercialize Brazilian technology.

Already, I see signs that these inventors are concerned about the quality of Brazil's intellectual property system. I have found a similar pattern in Ecuador and several other Latin American countries. Others have told me of similar developments in Korea and India.

My *second prediction* is that, once WIPO recovers its budget, it will partner with other institutions, including perhaps the World Bank, to develop a better understanding of the multiple effects of robust intellectual property protection on activity patterns in developing countries. I have already given you a suggestion along these lines. This type of activity has been outside, or at the margins of WIPO's charter. This is why partnering with economic institutions such as the IDB and World Bank can make good sense.

My *third prediction* is that judicial systems, in many countries will be upgraded, as elite groups come to appreciate that national economic performance requires good judicial system performance. This is particularly true for countries that are shifting from "state command" economies to market-based resource allocation with private actors making more decisions. Once a few major developing countries improve their judicial system

---

[12] Robert M. Sherwood, *Patent Disclosure and the Protection of Undisclosed Information: A Useful Dichotomy that Propels Technology*, in the *Proceedings of the 20th Intellectual Property Seminar of the ABPI*, (Rio de Janeiro, Brazil, 2000).

performance and the results are seen, many others will follow them. Hopefully, the measurement of economic damage caused by judicial dysfunction, which I described a moment ago, will help to accelerate this process.

Now let me close with the third part of my remarks, *Hope for the Future.*

Gradually the benefits of robust intellectual property protection will be understood by sufficient elements within enough developing countries so that fear of the unknown will be overcome, and robust protection will be achieved in enough places to shift a generally negative mindset to a more positive attitude. The results will be gratifying for most interests in those countries. I suspect this will happen more swiftly than might be projected today. Among other things, the increasing awareness of the role of knowledge in development, the inclusion of patent applications from many developing countries in the world's full-text searchable databases, and greater intimacy within the world's scientific community will accelerate this development.