Have Developing Countries Gained From the Marriage Between Trade Agreements and Intellectual Property Rights?

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ABSTRACT

Have Developing Countries Gained from the Marriage Between Trade and Intellectual Property Rights?

Sumner J. La Croix and Denise Eby Konan

In 1995, the new WTO Agreement incorporated rules on trade-related intellectual property rights (TRIPS). The TRIPS Agreement mandated that all member countries establish minimum standards for copyright, patent, trademark, trade secrets, and geographical indications; have public and private remedies for violations. Have developing countries gained from the marriage between trade agreements and intellectual property rights (IPRs)? We use historical, theoretical, and empirical methods to answer this question. First, U.S. history clearly demonstrates that it is unnecessary for a developing country to recognize foreign IPRs to experience strong growth. Second, recent theoretical contributions to the patent literature show that patent harmonization can lead to world welfare gains if developing countries are provided with lump-sum compensation to offset higher royalty payments. Third, we show that the dismantling of the MultiFibre Agreement did not provide this compensation. Fourth, stronger patent laws generated an array of generally positive effects with respect to foreign direct investment and licensing. Fifth, digitization has combined with the internet to radically change the incentives to copy and distribute copyrighted works. We argue that the extensive copying of copyrighted works in Asia represents a breakdown in relations between the developed and developing countries. Finally, we conclude with a brief discussion of critical issues in patent and copyright law.

I. Introduction

In 1995, the new WTO Agreement included extensive new rules on Trade-Related Intellectual Property Rights (TRIPS). The Agreement on TRIPS established minimum standards for copyright, patent, trademark, trade secrets, and geographical indications; specified public and private methods to enforce these rights; and provided developing countries with additional time to meet these goals. During the ensuing ten years, multiple situations have developed which have prompted governments, international institutions, and individuals to question whether developing countries are gaining from the marriage of trade agreements and intellectual property law.

Our analysis begins by examining the nineteenth-century development of two economic giants, the United States and Japan, and the role that intellectual property rights played in their development. We find that the United States provided strong patent protection to domestic and foreign innovators and no copyright protection for foreign authors during much of the nineteenth century. By contrast, Japan provided relatively weak patent protection initially and then moved to strengthen patent protection as its industries became more focused on developing new products and production processes. We note that both of these successful development strategies are now prohibited by TRIPS rules setting minimum patent standards and prohibiting national bias in copyright law.

We then show how changes in the structure of U.S. industry prompted a major change in U.S. IPR policy. After extensive bilateral pressure on both developed and developing countries during the 1980s and 1990s, the United States joined the European Union in pushing for the incorporation of minimum IPR standards in the 1995 WTO

treaty. We provide a brief outline of the major provisions of the TRIPS Agreement and then present a brief summary of the major international developments since TRIPS. The main trends are (1) the United States and the European Union continue to press for establishment of IPRs in "new" fields of intellectual innovations, including genetically modified plants and animals, computer software, business methods, and chip designs; (2) the United States and the European Union compete to strengthen copyright and patent protection and to force developing countries to strengthen their laws and enforcement; (3) the United States and the European Union join the World Copyright Treaty (WCT) which prohibits de-encryption devices, breaking encryptions, and distributing copyrighted products using channels not allowed by their owners; and (4) the resistance of developing countries in Asia and elsewhere to all three trends identified above.

We examine recent theoretical literature on global IPR harmonization to determine whether IPR patent harmonization should be expected to generate increases in global welfare. Our review focuses on the two-country model developed by Grossman and Lai (2003), as this model generates a pattern of patent harmonization that is broadly consistent with the pattern established in TRIPS. Grossman and Lai find that patent harmonization can e predictions of pat has generated increases produced increases in flows of FDI to developing countries; R&D in developed and developing countries; and trade between developed and developing countries in IPR-intensive goods.

Fourth, we consider how the internet and digitization of copyrighted works have affected copyright piracy within and across countries. Digitization has reduced the cost of copying most copyrighted material and requires changes in copyright law if these works are to be optimally protected. The internet has facilitated both national and

international piracy of copyrighted digitized works. As knowledge-intensive services become a bigger component of GDP, copyright law is assuming a more prominent role in GDP growth. We consider how these changes affect developing and developed countries and evaluate whether changes in the structure of copyright law and the TRIPS Agreement will be necessary. We argue that changes in TRIPS should and can be structured to be Pareto-improving, i.e., to improve global efficiency and to increase the welfare of all participating countries.

We conclude with suggestions for modifying the TRIPS Agreement to ensure that both developing and developed countries gain from global IPR harmonization. Since IPRs are just one tool for stimulating innovation in developing countries, we briefly consider the gains from establishing complementary national and international policies and programs that are critical for stimulating innovation and growth.

II. Are Strong IPRs Necessary for Development? The Case of the United States

The literature is divided on this issue. Some economists (Evanson and Westphal, 1995) have argued that a simple package of intellectual property rights is likely to enhances GDP growth even in very low-income countries. Others (Helpman 1993; La Croix and Konan 2002) have argued that the increased protection leads to a transfer of rents to developed countries, restrains consumer access to new goods, and makes it more costly for nascent R&D efforts to develop new products that will find a market in the home country or foreign countries.

One way to consider the question is to look to history and examine the interaction between IPRs and economic growth for the countries which industrialized during the nineteenth century—today's developed countries. Kenneth Sokoloff and Zorina Khan

(2001) observe that the system of patent rights established in Britain had numerous features that "reflected its origins in royal privilege" (p. xx). Several officials needed to approve the patent application; high fees were charged to file a patent application; access to the patent's design was restricted until its expiration; patents could be obtained on technologies discovered by a third party outside Britain, and the patent had to be used inside Britain ("working requirements") to remain in force. Britain was not alone in allowing foreign discoveries to be patented by a British third party without the consent of the original discover; other countries, including France and the Netherlands also allowed for the patenting of pirated technologies. These provisions meant that domestic intellectual property laws in Europe's leading countries actually encouraged the pirating of foreign technologies during the first half of the nineteenth century.

Sokoloff and Khan (1998) found that the framers of the U.S. Constitution and the legislators in the first sessions of the U.S. Congress were familiar with British precedent and consciously innovated when they considered intellectual property. The Constitution specifically provides the U.S. Congress with the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries"[1] In its first session, the U.S. Congress passed a revolutionary patent law that provided for low application fees, impersonal patent examination, grants only to the original discover, and disclosure of the invention's specification upon issuance of the patent.[2] Sokoloff and Khan argue that easy

[1] Article 1, Section 8, U.S. Constitution.

[2] The Patent Law of 1836 introduced the modern system of patent examination which provided for examination of patent applications by skilled examiners. Issues previously resolved by expensive and lengthy civil litigation were, after the Patent Law's passage, resolved by examiners in the U.S. Patent Office.

access to the U.S. patent law, speedy judicial remedy of disputes over patents, and access to large, new markets led to three important results. First, there was a surge in the per capita patenting rate over the course of the nineteenth century, with an increase of 1,500 percent recorded between the 1840s and the 1870s. Second, a larger percentage of inventors were more likely to specialize in inventive activity (Lamoreaux and Sokoloff, 1996, 1999). Third, the well-defined patent rights and specialization in inventive activity spurred the development of sophisticated technology markets in the mid-nineteenth century. Patent agents and lawyers not only facilitated the filing of patent applications, but also acted to match potential buyers and sellers of patented technologies and to match potential investors with inventors of new technologies.

The response to the highly productive American system differed across countries. In 1852, the leading political and economic power—Great Britain—strengthened its patent laws to bring them more into accordance with American practices. Two small countries—the Netherlands and Switzerland—eliminated vital patent laws at mid-century, and Switzerland did not restore its system until 1907, while the Netherlands waited until 1912.[3]

Numerous scholars (Griliches1994; Mowery 1983, 1995; Lamoreaux and Sokoloff 1999) have discussed the long-term decline in patenting rates by U.S. residents which began in the late nineteenth century and did not reverse course until the early the 1980s. While some of the change may have been due to the increased prevalence of research activities within large corporations, Lamoreaux and Sokoloff (1999, 2000) also speculate that a series of federal court rulings between 1890 and 1920 reducing the scope

[3] Would Albert Einstein have developed his theory of relativity if he had not been a bored worker at the defanged Swiss Patent Office?

of patent claims and establishing clearer rights in the use of other forms of contract and property law to protect inventions had the effect of reducing the expected value of a patent. This led firms to choose other, more effective instruments (trade secrets, restrictive covenants, rights to employee patents) to establish rights to their inventions. The long-term trend in patent protection in the United States is surprising: strong patents rights during the nineteenth century, weaker patent rights from early twentieth century to the 1980s and stronger patent rights covering a larger spectrum of inventions since the early 1980s.

At the 1883 Paris Conference on international patent rights, there was conflict between the United States, which favored a patent system with reciprocal rights (they provide countries with weaker systems incentives to upgrade) and with few exemptions, while Great Britain and France wanted a weaker system with national treatment (it provides few incentives to countries with weaker systems to upgrade) and compulsory licensing. The final Convention was a blow to U.S. interests as it adopted national treatment as the required standard for patent law rather than reciprocal treatment.

U.S. copyright law follows a very different course from U.S. patent law. The first U.S. copyright law (enacted in May 1890) "secured the copies of map, charts, and books to the authors and proprietors of such copies" after registering their copyright, depositing the copy, notifying the public, and paying a nominal fee. Judicial decisions and legislative amendments changed the copyright law substantially during the nineteenth century, with U.S. courts weakening protection by recognizing the doctrines of fair use, first sale, and work for hire and expanding protection by increasing copyright terms, extending copyright protection to new products, such as photographs, lithographs, and

records, and providing protection to derivative products, such as translations and performances.

A major contrast between American and European copyright laws at the beginning of the nineteenth century was that American law did not provide protection for foreign copyright, while copyright laws in Great Britain and France protected foreign copyrights. By contrast France and Britain both recognized foreign copyrights with reciprocity and domestic publication early in the nineteenth century and granted national rights to foreigners by mid-century. Their copyright stance is consistent with their respective positions as the supply of literary and nonfiction material to millions of French- and English-speaking residents of their current colonies or former colonies. It is unsurprising that France was the leader in this drive, as France was more likely than Great Britain to remain a net supplier of literary and nonfiction works to its numerous small colonies. By contrast, government officials in Great Britain surely recognized that it would become a net importer of copyrighted material as population and income in its former colonies soared.

Between 1820 and 1890, American and European authors regularly lobbied the U.S. Congress to change this provision and were opposed by the publishing lobby. An 1841 Convention between Great Britain and the United States providing for recognition of foreign copyrights was not even considered by the U.S. Senate. In 1883 the U.S. government turned down an invitation to attend a conference in Berne organized to consider international harmonization of copyright law and refused to sign the 1886 Berne Convention. Sokoloff and Khan (2001) assert that the growth of the American literary sector in the late nineteenth century may have increased the demand for American books

in foreign countries sufficiently to induce a change in the wealth-maximizing U.S. policy. Thus, as the U.S. switched from being a net importer to being a net exporter of copyrighted goods, Congress responded in 1891 by amending the U.S. copyright law to recognize foreign copyrights.[4]

The U.S. recognition of foreign copyrights was not retroactive, i.e., work already in the public domain remained there. From the perspective of wealth maximization, this is understandable as the stock of valuable prior work was predominately that of British authors. Establishing copyright in the already existing stock of books could increase neither the quality nor quantity available to the public—and it prevented the payment of royalties to popular British authors.

III. Bilateral Pressure, TRIPS, and the World Copyright Treaty

The schizophrenic attitude of the U.S. towards intellectual property rights (strong on patents, weak on copyrights) changed as the structure of the U.S. economy changed after World War II. With the growth of the computer software industry (most software being protected by copyright), the rise of large export markets for U.S. films, television programs, videogames, and phonograms, the United States began to run large surpluses in trade of copyrighted material even as the overall current account deteriorated. Siwek (2004) shows that the size of copyrighted industries (as a percentage of gross domestic product) and their export share has continued to expand over the last 15 years.

Intellectual property rights (IPRs) have been a contentious issue for the United States and developing countries for the last 25 years. In the early 1980s, the U.S. Trade Representative (USTR) found that many developing countries—the ASEAN countries

[4] Books with foreign copyright holders had either to be printed in the United States or to have their printing plates manufactured in the United States. This requirement remained substantially unchanged until the United States joined the Berne Convention in 1988.

prominent among them—had weak intellectual property laws or failed to take adequate measures to enforce them. The USTR threatened countries with loss of their GSP (Generalized System of Preferences) status and other trade-related benefits if they did not take action to strengthen statutory IPRs and enforcement activities. Between 1985 and 1995, numerous Asian countries, in response to U.S. pressure and to the changing structure of their own economies, strengthened their IPR laws and took significant measures to enhance IPR enforcement. The "Trade Related Aspects of Intellectual Property Rights" (TRIPS) provisions of the 1994 Uruguay Round GATT Treaty represent a significant step on the road to IPR convergence by both developed and developing countries, as the TRIPS provisions commit all GATT signatories to establishing IPRs which meet specified minimum standards (Table 1).

The 1994 TRIPS Agreement was intended to harmonize national systems of IPRs and to broaden and strengthen the legal rights provided to owners of intellectual property. TRIPS forced many middle-income and developing countries to make extensive changes to their IPR laws in the mid-1990s and to spend additional resources on IPR enforcement activities. More surprising is that the United States and Europe also had to enact significant upgrades to their IPR laws to conform to TRIPS.[5]

There have been several significant events regarding intellectual property rights over the last decade since the creation of the TRIPS agreement. Among these are two World Intellectual Property Organization (WIPO) treaties, the Doha Declaration on the TRIPS Agreement and Public Health, significant upgrades of copyright laws in

[5] Major changes included increasing patent terms from 17 to 20 years of protection; providing patent protection to pharmaceutical products; and establishing a system of IPR protection for plants.

developed countries, and the negotiations on the harmonization of substantive patent law, geographical indications, and the protection of traditional knowledge.

The two significant WIPO treaties relating to IPR are the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT). The WCT was an extension of the Berne treaty (1971), and did not have any connection with treaties other than the Berne Convention; although they were not a part of WTO IPR negotiations. The WIPO Copyright Treaty was implemented in U.S. law by the Digital Millennium Copyright Act (DMCA). In March 2000, the European Council approved the treaty, on behalf of the European Community. With Gabon's accession to the treaty in December of 2001, the necessary 30 countries have ratified the treaties to become law, although as of December 6, 2004, only 50 countries had ratified the WCT treaty, and 48 countries had ratified the WPPT treaty.[6]

The treaties make clear that copyright applies on the Internet as it did in the off-line world. One stipulation of the treaty is that authors, performers, producers, etc. are able to specify how and when they would like to distribute their music. This exclusive "making available" right covers many different types of dissemination of music, from listen-only services to those that allow the download of permanent copies. It provides the basis for record companies or licensees to develop different forms of business models, examples of which are currently reflected in ventures such as Music Net (involving BMG, EMI and Warner), Press Play (involving Sony Music and Universal), Itunes (Apple), and a number of ventures by independent record companies.

[6] http://www.wipo.int/treaties/en/index.html.

The WIPO treaties also protect the technologies that enable new uses of copyrighted material. The treaties recognize that copyright holders need to use technical measures, such as encryption, passwords and scrambling, in order to manage the delivery of their works to consumers, as well as to protect them from piracy and unauthorized copying. Examples of technical measures include the use of copy control technologies and the use of rights management information to identify content and channel payments digitally to the appropriate copyright holders. The treaties also require governments to protect such measures from hacking and circumvention effectively, which should include outlawing the manufacture and distribution of a range of circumvention devices.[7]

Along with the WCT and WPPT treaties, WIPO also helped make great strides towards the development of a global patent system and harmonization of patent law in September of 2001. Their efforts included the promoting the ratification of the Patent Law Treaty (PLT), which harmonized procedures for patent applications, promoting the reform of the Patent Cooperation Treaty (PCT) of 1970, and addressing negotiations on a Substantive Patent Law Treaty (SPLT).[8] The Patent Agenda is meant to address the failure of the system to adequately respond to the international nature of business activities, the high costs of obtaining patents, the workload crisis in patent offices and time-consuming procedures.[9]

Ironically, just one month later, on October 18th, Canada decided to break drug manufacturer Bayer Ag's patent on Cipro over concerns of a "matter of availability" in

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[7] http://www.ifpi.org/site-content/press/20011206.html.

[8] http://www.iprsonline.org/unctadictsd/bellagio/docs/Correa_Bellagio2.pdf.

[9] See Memorandum of the Director General, Agenda for Development of the International Patent System, August 2001, WIPO A/36/14, Geneva, para. 17 – 28.

the case of an anthrax outbreak. One week later, the United States reached a "beneficial" agreement with Bayer AG for supplies of Cipro; Bayer provided 100 million Cipro tabs for $0.95 each, a little more than half the $1.77 the government had reportedly been paying.[10]

The Doha Declaration on the TRIPS Agreement and the Public Health, adopted in November 2001, was one of the most important international developments in the area of IPR in WTO since the adoption of the Agreement in 1994. The Doha Declaration was important to developing countries in particular, as the public health consequences have been far reaching. The Declaration has indicated that in cases of conflict between IPR and public health, the former should not be an obstacle to the realization of the latter. This was primarily political in nature, and the economic tradeoff between greater patent protection (namely drugs) and social welfare was the focus of debate. In affirming that the TRIPS Agreement, "can and should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, to promote access to medicines for all,"[11] paragraph 4 gives guidance to panels and the Appellate Body for the interpretation of the Agreement's provisions in cases involving public health issues.[12] This space for interpretation reduces the effect of bilateral pressures and the risk of potential disputes linked to the TRIPS and the implementation of national health policies. In addition to this, least developed countries are not required by the treaty to enforce patent rights on pharmaceuticals until January 1st of 2016, and have until January

[10] http://www.fool.com/news/2001/bayzf011025.htm.

[11] http://www.worldtradelaw.net/doha/tripshealth.pdf.

[12] http://www.iprsonline.org/unctadictsd/bellagio/docs/Correa_Bellagio2.pdf.

1st of 2006 to apply the basic TRIPS Agreement's provisions. This decision allows developing countries to take necessary steps towards improving heath conditions in their respective territories without jeopardizing their economic development.[13]

Geographical indications have also been important in IPR over the last decade. Geographical indications are place names used to identify the origin and quality, reputation or other characteristics of products. Under the TRIPS Agreement, protection is defined in two articles: Articles 22 & 23. Article 22 covers all products, which defines a standard level of protection. This says geographical indications have to be protected in order to avoid misleading the public and to prevent unfair competition. Article 23 provides a higher or enhanced level of protection for geographical indications for wines and spirits. During the Doha round of trade negotiations, the two main concerns over geographical indications were a multilateral register for wines and spirits, and extending the higher (Article 23) level of protection beyond wines and spirits.[14] Disagreement on expansion of Article 23, however, became a thorny issue for many countries, and geographical indications talks have been linked with agricultural negotiations which makes it even more difficult to find a compromise. More recently, talks over geographical indications have been sidelined, although they will most likely be reintroduced with a new round of WTO negotiations in 2005.

Traditional Knowledge (TK) has become increasingly important in IPR protection as well, although there are no set international standards as of yet specifically protecting TK. TK is defined through WIPO as any tradition-based literary, artistic or scientific

[13] http://www.ciel.org/Publications/Doha_IP.pdf,

[14] http://www.wto.org/english/tratop_e/trips_e/gi_background_e.htm.

work, such as performances, inventions, scientific discoveries, designs, etc.[15] The TRIPS agreement does not specifically deal with TK in the formal sense; instead, it grants monopoly rights by way of patents to inventions, whether products or processes, in all fields of technology only provided that they are new, involve an inventive step and are capable of industrial application. Because of this and from a lack of other agreements, TK has been forced to go through the "normal" means of IPR protection as discussed above, such as low-cost patents, trademarks, copyrights, and geographical indications. WIPO has presented a set of criteria, however, which could be an important first step towards recognition of TK in the IPR world: splitting up TK into two separate categories. The first category covers biodiversity and medicine, such as traditional agriculture or medical techniques. The second category covers the arts, such as music, designs, and expressions.

IV. Does Patent Harmonization Increase Global Welfare?

The economics literature is divided concerning the welfare implications of minimum IPR standards and IPR harmonization. Evanson and Westphal (1995) and Taylor (1998) concluded that a well functioning IPR law is a critical component of the institutional package required for economic development. Helpman (1993) used a dynamic two-country (North-South) model to show that stronger IPRs can reduce welfare in the South and reduce global R&D. Grossman and Lai (2003) develop a two-country (North-South) model that yields results similar to those generated by the 1995 TRIPS Agreement. We examine this model in more detail below.

A. Grossman and Lai's Theoretical Results

[15] Intellectual Property Needs and Expectations of Traditional Knowledge Holders — WIPO Report on Fact-Finding Missions on Intellectual Property and Traditional Knowledge, *WIPO, April 2001, p. 25.*

Several authors (McCalman, 2002; Grossman and Lai, 2003) have investigated the choice of IPR standards by developing and developed countries in the absence of global cooperation on IPR but in the presence of global information, capital, and product flows. Grossman and Lai note (p. 2) that "[i]t is not obvious how a government ought to set its IPR policy if some of the benefits of its national innovation accrue to foreigners, if its constituents benefit from innovations that are encouraged and take place beyond its borders, and if domestic and foreign firms differ in their ability to innovate." They consider a world economy with two-countries (North-South) that differ with respect to market size and ability to innovate. Each country has two sectors, one producing a homogeneous good and a second producing a continuum of differentiated products. Designs for the differentiated products emerge from R&D conducted by individual firms; the designs can be imitated by other firms if the designs are not patent-protected. The optimal patent system is derived for each of the two countries for three cases: (1) each country is an autarchy; (2) the two countries trade and independently determine their patent systems; and (3) the two countries trade and agree to use the globally efficient patent system.

In the first case (*autarchy*), Grossman and Lai find results broadly similar to those of Nordhaus (1969): optimal patent protection increases as the useful life of the product increases and as the productivity of R&D expenditures increases; and falls as consumer discount rates increase. Market size has indeterminate effects on the strength of patent protection. In their base case, in which R&D is produced using a Cobb-Douglass production function, optimal patent protection is positively related to market size.

In the second case (*trade in differentiated goods, national treatment, and no parallel imports*), the North adopts stronger patent protection than the South due to its higher human capital endowment and the higher productivity of labor in the North than the South; patent protection is, however, lower in both the North and the South than in the closed economy case.[16]

In the third case (*globally efficient patent protection which, by definition, maximizes the sum of North and South welfare*), Grossman and Lai show that the welfare of the North increases as Southern patent protection increases, while the welfare of the South increases as Northern patent protection weakens. They show that there is a range of joint patent policies that maximize world welfare but which have vastly different effects on the welfare of each country. Many (but not all) of the welfare-maximizing patent combinations require that the North pay a lump-sum to the South if Southern welfare is to be higher than in the second case discussed above.

Finally, efficient patent harmonization (*identical patent policies which maximize the sum of North and South welfare*) produces an increase in patent protection in both countries as well a gain in welfare in the North. The South requires a lump-sum payment from the North in order to offset the negative effects on Southern welfare generated by the increased flow of royalty payments to the North.

B. The 1994 WTO Agreement: Trading IPRs for Clothing?

Grossman and Lai's theoretical results concerning the implications of IPR harmonization and strengthening parallels the conventional wisdom on the political economy of the TRIPS Agreement: TRIPS imposed losses on developing countries due to the premature strengthening of their IPRs but were more than compensated for their

[16] Adding additional countries into the model reduces optimal patent protection for a small country to zero.

losses by the provisions in the WTO Agreement providing for the dismantling of the MultiFibre Agreement beginning in 2005 (Harrison, Tarr, and Rutherford). Could the dismantling of the MFA provide the lump sum compensation necessary for developing countries to gain from the TRIPS Agreement?

The MultiFibre Agreeement (MFA)—a part of the 1974 GATT Agreement—established quotas on the export from developing to developed countries of textiles and clothing made from cotton, wool, and synthetic fibre. Quotas to developing countries were not allocated on the basis of cost but rather population, income, and resource availability. Economists generally consider MFA to be protectionist legislation designed to protect two labor-intensive industries—clothing and textiles—in which the developed countries no longer have a comparative advantage. The 1994 WTO Agreement contained provisions phasing out all textile and clothing quotas by January 1, 2005. In the interim, the MFA was replaced by the Agreement on Textiles and Clothing (ATC) in which developed countries have agreed to phase out textile and clothing quotas according to the following schedule:

- 16 percent of products imported in 1990 integrated on January 1, 1995;
- 17 percent of products imported in 1990 integrated on January 1, 1998;
- 18 percent of products imported in 1990 integrated on January 1, 2002;
- 49 percent of products imported in 1990 integrated on December 31, 2004.

The WTO's Textile Monitoring Body (TMB) found that developed countries had lagged behind on their obligations, with the amount of restrained trade left to be integrated by the EU and the US by December 31, 2004 at 80 and 68 per cent, respectively. The ATC also provided a special safeguard mechanism that triggers when

an overall increase in covered product imports is found to be causing serious damage to the home country's textile or clothing industry.[17]

Neither the WTO negotiators, who ostensibly added the MFA phaseout and the TRIPS phase-in to the 1994 WTO deal to complete the negotiations, nor the economists who subsequently analyzed the deal nor the representatives from the developing countries with MFA quotas gave much thought as to how the MFA phase-out would affect the developing countries. The simple analysis—that quotas restrain a country's trade—was applied to rationalize the argument that individual developing countries would gain from the removal of quotas. Konan, La Croix, Roumasset, and Heinrich (1995), Harrison, Tarr, and Rutherford (1997), and several others made such arguments in the 3-4 years after the WTO was concluded. Unfortunately, the economists analyzing this issue all failed to address three important factors: (1) rapid productivity improvements and growth in India's economy after 1996; (2) China's admission to the World Trade Organization and its strong economic growth over the 1995-2005 period; (3) and the assignment of quotas to developing countries who would not be the least-cost producers of clothing and textile products in 2005.

The 1 January 2005 termination of textile-clothing quotas is likely to generate very uneven effects across developing countries, as low-cost developing countries are expected to increase production dramatically, while high-cost developing countries will experience a closure of some or all clothing-textile manufacturing plants. A report issued by the U.S. International Trade Commission (2004) concluded that there will be

[17] Anti-dumping measures and more restrictive rules of origin are being used to replace the quotas in the United States. Developing countries expected to lose productive capacity in this area are asking the U.S. Congress to enact preferential tariff rates to allow them to retain some export business.

increased sourcing of textiles from East and South Asia and less sourcing from ASEAN countries, the Andean countries, Sub-Saharan African countries, some Caribbean countries, and Mexico.[18]

The switch of textile-clothing production from high-cost developing countries to low-cost developing countries and from textile-clothing production in high-cost developed countries to low-cost developing countries clearly improves world efficiency by reducing overall resources spent on textile-clothing production and by lowering the price of textiles-clothing in developed countries. But as compensation to developing countries for large losses due to higher streams of net royalty payments under the TRIPS agreement, the MFA phaseout leaves much to be desired. A handful of developing countries—China, India, and Pakistan—will gain handsomely from the MFA phase-out; a few others—perhaps Vietnam, perhaps Indonesia—will retain some textile-clothing export business; and the vast majority of developing countries will see clothing-textile exports totally disappear.

The stark reality is that for all but three developing countries (albeit with 40-45% of the world's population), the MFA phase-out delivers moderate to large losses to the 35 other developing countries with MFA quotas in 1995.[19] Coupled with TRIPS, the MFA phase-out represents a large transfer of wealth from 356 developing countries to 3 developing countries and the developed countries. In sum, Pareto optimality fails big time.

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[18] The large number of developing countries losing from the elimination of the MFA-ATC quotas may help to explain why the quota phase-outs were delayed until 2005: to provide the losing developing countries with an additional ten years of benefits prior to the phase-out.

[19] Bangladesh, Brazil, Columbia, Costa Rica, Czech Republic, Dominican Republic, Egypt, El Salvador, Fiji, Guatemala, Honduras, Hong Kong, Hungary, Indonesia, Jamaica, Kenya, South Korea, Macao, Malaysia, Mexico, Oman, Panama, Peru, Philippines, Poland, Romania, Singapore, Slovakia, Slovenia, Sri Lanka, Thailand, Turkey, and Uruguay.

Finally, and most importantly, should the WTO be in the business of forcing developing countries to adopt welfare-reducing IPR institutions in exchange for the welfare-increasing dismantling of non-tariff trade barriers in textiles? Probably not, unless it can be shown that the distortions only persist for a limited period of time.

C. Empirical Effects of IPRs on Trade, Investment and Technology Transfer

Inherent in the inclusion of intellectual property (IP) protection under the scope of the World Trade Organization is the notion that the protection of patents, trademarks and copyrights is somehow 'trade-related'. Exports embody technology and serve as a means of transferring knowledge to foreign markets. Treatment of knowledge in recipient countries thus intuitively should be linked to trade flows. Protection of intellectual property is also clearly a factor in a firm's decision to transfer technology more directly to those markets through establishments of foreign subsidiaries, franchises, or license arrangements. The second-best nature of IP protection, renders the drawing of theoretical conclusions on just how international flows might be impacted by harmonization of standards quite indeterminate.

Very simply, intellectual property protection grants market power to the owner of the invention or creation. The stronger is the protection and the enforcement of the property right, the great is a firm's monopoly power. Thus, firms may decide to restrict sales in markets where IPRs are strongly protected to extract monopoly rents – a market power effect. That is, the market structure may be less competitive in markets in which foreign imitators are not present, and this might dampen exports as the firm seeks higher cost markups. At the same time, the firm will incur a lower cost of protecting IP in markets with strong protection – an efficiency effect which would expand sales in

countries that strengthen IP protection. Thus, a classical ambiguity exists between the level of IP protection in foreign markets and the propensity of knowledge-intensive firms to sell to those markets.

The relationships become more complex when alternative modes of delivery are considered. A firm may serve a foreign market at arm's length with exports, by a local subsidiary with foreign direct investment, or by franchising or licensing relationships with a local partner. Each decision is influenced by the nature of the industry, the mechanisms for the transfer of technology, the IP regime in place, and the methods by which imitation might be conducted. A weak IP regime increases the probability of imitation which dissuades foreign investors. However, stronger IP protection tends to shift the mode of entry from direct investment through multinational enterprises toward licensing. Thus the impact of strengthened IP protection on exports, foreign investment, and licenses are interrelated and complex.

IPR regimes have strengthened dramatically since 1990. The Park-Ginarte Index of patent rights (with 0 the lowest and 5 the highest) registered just 2.06 in 1960. Developed countries registered 2.5 and developing countries 1.5 in 1960. Despite large increases in world income between 1960 and 1990, the Park-Ginarte Index increased only to 2.46 in 1990. The increase to 3.07 in 2000 reflects a variety of factors, including bilateral pressure from the United States and the European Union, TRIPS, and rising incomes. The gap between developing and developed countries barely changed, with less than 5 percent of the gap closed over the index's 40-year coverage.

Fortunately, a series of empirical studies have emerged in recent years to clarify the relationships involved. A pioneering effort was that of Maskus and Konan (1994)

who found that strong IP protection tends to increase bilateral imports and foreign investment over values predicted for countries by gravity equations. Maskus and Penubarti (1995) refined the analysis by using the Helpman and Krugman monopolistic competition model of trade to predict trade flows in the presence of IP protection and other instrumental variables. They provided strong evidence that stronger IP protection has a positive impact on bilateral manufacturing imports. The impact of IP protection was found to be greater the larger was a country's market. Thus the strengthening of IP protection appears to enhance the volume of imports to that market.

Lee and Mansfield (1996) used U.S. firm survey data to show that the strength of a country's IP protection is positively correlated with the aggregate volume of U.S. FDI inflows to that country. Using a gravity equation approach, Smith (2001) considered how IP protection influences a wider range of modes to supply foreign markets. The stronger was IP protection within a country, the greater the propensity of U.S. firms to export to that market. Additionally, with strong foreign IP protection, U.S. firms are relatively more likely to use foreign affiliates and license arrangements rather than export sales. Thus, overall international linkages are strengthened with IP protection, and the distribution of the delivery decision tends to favor local distribution. Yang and Maskus (2001) also find that licensing is more likely to take place the stronger is IP protection.

A survey of U.S. manufacturing firms by Mansfield (1994, 1995) provides evidence that the importance of IPRs differs across sectors, even those that might be identified as 'technology intensive.' Respondents were far less concerned about IP protection on investment decisions regarding sales and distribution outlets. IP protection

was viewed as far more important for investments in manufacturing and production, most especially when technology transfers are involved.

Using an original firm-level survey as well as country characteristic data for transition economies, Javorcik (2004) considers empirically how IP protection impacts the volume as well as the distribution of FDI. She finds that strong IP protection is positively correlated with inward foreign investment in sectors that have been identified as 'technology-intensive.' Additionally, the stronger is IP protection, the more likely are high-technology firms to engage in foreign manufacturing investments rather than merely distribution sales.

Would developing countries lose by adopting stronger IPRs? Using a sample of countries with GDPs below the median GDP and an index of average patent protection between 1960 and 1990, Ginarte and Park (1997) found that stronger patent rights had no effect on growth. Maskus (2001) argues that stronger IPRs tend to stimulate economic growth in developing countries which are open to trade and foreign investment. We note, however, that the indirect link between IPRs, foreign investment, and growth is tenuous, as the empirical literature on economic growth literature finds little connection between FDI and growth despite extensive theoretical results pointing to a possible connection (Carcovic and Levine, 2002). A similar critique applies to the link between growth and trade, which has been hotly debated recently (Frankel, 1999).

V. Global Copyright: Finally, In Crisis?

Robert Merges (2000) has noted that copyright law is constantly in crisis. The advent of the copier in the 1960s and the VCR in the early 1980s both brought forth protests from copyright industries and from academics that the "sky is falling" and the

publishing and movie industries would soon fail to be profitable. To the contrary, fair use copying has become the norm, and the VCR spawned a large after-market for films both in the United States and overseas.

Today's claim is more ominous: the combination of digitization and the internet has dramatically reduced the costs to consumers of copying copyrighted material and this combination has dramatically increased rates of consumer piracy. The speed with which a group of countries moved to ameliorate this problem is amazing. The World Copyright Treaty (WCT) was signed by over 40 countries in December 1996, just 2-3 years after widespread use of the worldwide web began. On the hand, most developing countries and some developing countries have not signed the WCT.

The Digital Millennium Copyright Act (DMCA) was passed to ensure the protection of copyright works in the digital world by fortifying the technological blocks on access and copying of those works within a legal framework. It was signed into law on October 28, 1998 as part of the U.S. implementations of the World Intellectual Property Organization (WIPO) Copyright Treaty and Performances and Phonograms Treaty,adopted by several countries around the world two years earlier. The DMCA implemented these recommendations and added more of its own, which gave copyright owners broader protection than what was provided for in the two WIPO treaties.[20] The DMCA contains four main provisions:

1. a prohibition on circumventing access controls [1201(a)];
2. an access control circumvention device ban [1201 (a)];
3. a copyright protection circumvention device ban [1201(b)]; and,
4. a prohibition on the removal of copyright management information (CMI) [1202(b)].[21]

[20] http://www.chillingeffects.org/anticircumvention/faq.cgi#QID123.

[21] http://thomas.loc.gov/cgi-bin/cpquery/0?&&db_id=cp105&&r_n=hr796.105&&sel=DOC&

The first provision of the DMCA prohibits defeating the access control measure that protects or limits access to digital information. Defeating the access control measure, or "circumventing a technological measure," means to descramble a scrambled work, to decrypt an encrypted work, or otherwise to avoid, bypass, remove, deactivate, or impair a technological measure without the authority of the copyright owner. The second provision bans trafficking in devices that circumvent access controls. A good example of this is from the Scandinavian teenager who found the hole in the DVD code and posted how to break the encryption on the Internet. The third provision bans trafficking in technology that circumvents technological measures that limit the ability to reproduce a copyrighted work. An example of this kind of technological protection is an encoding technique that prevents a music CD from being played and therefore copied on a computer. The fourth provision bans the alteration of copyright management information or providing false copyright management information. Copyright management information is information conveyed in connection with a copyrighted work for the purposes of identifying its origin; such information could include the title, author, name of the copyright owner, terms and conditions for use of the work, and identifying numbers or symbols referring to the above information.[22]

[22] http://depts.washington.edu/uwcopy/Copyright_Law/DMCA/Provisions.php. The first three provisions are distinguishable from the fourth, in that the first two provisions focus on technological protection systems that provide access control to the copyright owner, while the third provision prohibits circumvention of technological protections against unauthorized duplication and other potentially copyright infringing activities. Another DMCA provision of DMCA is designed to protect internet service providers (ISPs), allowing ISPs to escape liability for the actions of its users so long as they did not know or have reason to know that their users were violating a copyright holder's rights. The DMCA allows for both civil remedies and criminal penalties for violations under the anti-circumvention provisions. The civil and criminal penalties in the DMCA are well defined, in sharp comparison to the WIPO treaties, with their relatively lax and subjective penalty clauses. In the United States, if the violations of the DMCA are determined to be willful and for commercial purposes or private financial gain, the court can order

The European Union has passed similar but slightly different legislation.[23] Most countries have, however, not passed similar legislation and therein lies the root of the problem. These countries can become centers of piracy for individuals in other countries wishing to download copyrighted works. Off-shore sites in international waters with computers linked to the web present additional problems. The problem of piracy has become compounded by the combination of broadband transmission with digitization. A "window of opportunity" of just an hour could now lead to all of the economics handbooks being downloaded. With the stock of copyrighted works so exposed, the choices for policymakers are stark.

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significant fines as well as jail time. Civil cases are brought in federal district court where the court has broad authority to grant injunctive and monetary relief. Injunctions can be granted forbidding the distribution of the tools or products involved in the violation. The court may also order the destruction of the tools or products involved in the violation. The court can also award actual damages, profits gained through infringement, and attorney's fees. If an individual held in violation of the DMCA commits another such violation within the three-year period following the judgment, the court may increase the damages up to triple the amount that would otherwise be awarded. In circumstances involving innocent violators, it is up to the courts to decide whether to reduce damages. But, in the case of nonprofit library, archives or educational institutions, the court must remit damages if it finds that the institution did not know of the violation. If the circumvention violations are determined to be willful and for commercial or private financial gain, first time offenders may be fined up to $500,000, imprisoned for five years, or both. For repeat offenders, the maximum penalty increases to a fine of $1,000,000, imprisonment for up to ten years, or both. Criminal penalties are not applicable to nonprofit libraries, archives, and educational institutions.

[23] Much like the Digital Millennium Copyright Act (DMCA) passed by the United States, the European Community also has their version, called the EU Copyright Directive (EUCD). Differing copyright regimes among European countries were seen as major obstacles to efficient trade, and the EC set about drafting a Directive on the subject between 1997 and 2000. The Directive sought to create a level playing field for the enforcement of intellectual property rights in different EU countries, by bringing enforcement measures into line across the EU, especially in those countries where the enforcement of intellectual property rights is currently weakest. The Directive covers infringements of all intellectual property rights (both copyright and industrial property, such as trademarks or designs), and concentrates on infringements carried out for commercial purposes or which cause significant harm to rights-holders. The EUCD does NOT cover music downloading or file sharing (it leaves this up to individual countries to enforce their own laws), but is instead concentrated on provisions of encoding and protections found in the two WIPO treaties and the DMCA. Also, similarly to the DMCA, the EUCD paves the way for injunctions to halt the sale of counterfeit or pirated goods, provisional measures such as precautionary seizures of suspected offenders' bank accounts, evidence-gathering powers for judicial authorities and powers to force offenders to pay damages to rights-holders to compensate for lost income.[23]

First, policymakers could increase copyright terms to provide more protection. Such extensions have been recently granted in the United States and Europe. Cheng (2004) has closely examined the U.S. Sonny Bono Copyright Term Extension Act (CTEA) passed in 1998 which extends copyright terms from life of the author plus 50 years to life of the author plus 75 years. Cheng and Landes and Posner (2003) both concluded that the effect of copyright term extension on future creations is neglible and that the main reason for the extension appears to be to extend the copyright term of valuable copyrights which would otherwise expire. We can find no efficiency rationales for this type of extension and conclude that retroactivity provisions drove the enactment of the law.

Second, governments could increase penalties for violations of copyright laws and provide additional resources for their enforcement. In countries which are net importers of intellectual property, these will be unpopular measures that could be difficult for the government to sustain, particularly given the decentralized nature of the copyright piracy in most developed and developing countries.

Third, governments could work together to establish new forms of intellectual property for some forms of property that meet consumer needs appropriately while providing reduced incentives for piracy. Software is one type of work for which protection is obviously too long.

VI. Conclusion

The "property rights" approach to economics rightly encourages the establishment of property rights in valuable goods, as well-defined property rights typically maximizes

the value of the good.[24] This perspective must, however, be modified for goods which are public goods. We conclude that it is important to establish property rights in new works while at the same time limiting those rights to allow widespread access to the new works. We expect property rights in goods and nontangibles to be established in all countries but their scope, depth, and enforcement to differ across countries according to their development status.

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[24] The establishment of property rights is, however, also costly, and the transaction costs of establishing these rights may limit their scope and delineation.

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Table 1

Major Features of the TRIPS Agreement

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1. GATT members must apply the principle of national treatment to all foreign IPR owners (Articles 1(3), 3).

2. All GATT members must comply with the central provisions of four conventions:

   a. Paris Convention (Article 2(1));
   b. Berne Convention (Article 9(1)) without moral rights provisions;
   c. Rome Convention (Article 14);
   d. and Washington Treaty (Article 35) with the modification that compulsory licenses of integrated circuit technology is prohibited.

3. GATT members cannot exclude certain classes of products from being patented (with limited exceptions specified in TRIPS); pharmaceuticals cannot be excluded from product or process patents (Article 27(1)).

4. Countries must protect patents for 20 years from date of application (Article 28).

5. Patent holders no longer have an obligation to work their patent locally if they supply the market's demand for the good with imports (Article 28).

6. Pharmaceutical products in the pipeline, i.e., which were developed earlier and are just now completing safety and efficacy procedures to come to market, must receive at least five years of protection (Articles 70(8), (9)).

7. GATT members must adopt either a patent system or a *sui generis* system for protecting plant varieties (Article 27).

8. The detailed enforcement procedures specified in the GATT must be incorporated into each member's national laws (Article 41).

9. GATT members must adopt stricter enforcement measures, including border controls, to prevent imports of counterfeit goods (Articles 51-60).

10. TRIPs eliminates compulsory licensing of trademarks as well as local linkage requirements (Articles 15-24). Marks may be assigned with or without the transfer of the business to which the trademark belongs.

11. TRIPs requires copyright protection of computer programs (10(1) and data bases (Article 10(2)). All computer programs must receive at least 50 years of protection (Article 12).

12. TRIPs requires all GATT members protect trade secrets (Article 39).

13. GATT members must protect original industrial designs for at least 10 years (Article 26).

14. TRIPs requires that authors and their successors in title have the right to authorize or prohibit the commercial rental to the public of originals or copies of their copyright works (Article 11). The substantive effect is to allow copyright owners to charge royalties or other fees for commercial rental of their works.

15. TRIPs requires that service marks as well as trade marks be protected (Article 15).

16. Commercial data submitted for regulatory approval of pharmaceutical or agricultural chemical products shall be protected against unfair commercial use (Article 39).

Table 2

Asian Countries which have Ratified WCT and WPPT

World Copyright Treaty				World Performances and Phonograms Treaty			
Contracting Party		Status	Entry into Force	Contracting Party		Status	Entry into Force
Indonesia		In Force	6-Mar-02	Indonesia		In Force	15-Feb-05
Japan		In Force	6-Mar-02	Japan		In Force	9-Oct-02
Mongolia		In Force	25-Oct-02	Mongolia		In Force	25-Oct-02
Philippines		In Force	4-Oct-02	Philippines		In Force	4-Oct-02
South Korea		In Force	24-Jun-04				

Source: World Intellectual Property Rights Organization

Table 3

Estimates of Losses from Piracy in Asian Countries
2003

Country	Motion Pictures		Records & Music		Business Software Applications		Entertainment Software		Books
	Loss	Piracy Level	Loss	Piracy Level	Loss	Piracy Level	Loss	Piracy Level	Loss
Australia									
Hong Kong									
India	77	60%	6	40%	187	73%	113.3	84%	36.5
Indonesia	29	92%	44.5	87%	94	88%	NA	NA	30
Japan									
Malaysia	38	50%	40	45%	77	63%	NA	NA	9
Pakistan	12	95%	70	100%	9	83%	NA	NA	44
People's Republic of China	178	95%	286	90%	1787	92%	568.2	96%	40
Philippines	33	89%	22.2	40%	33	72%	NA	95%	45
Singapore									
South Korea	40	20%	3.5	20%	275	48%	248.4	36%	38
Taiwan	42	44%	58	42%	83	43%	261.8	42%	20
Thailand	28	60%	26.8	41%	84	80%	NA	82%	28
Vietnam	7	100%	NA	NA	24	92%	NA	NA	12

Source: International Intellectual Property Association.
Note: All losses are $US millions.