
Intellectual Property Rights and the Uruguay Round

By Keith E. Maskus

Recent international trade negotiations have centered on completing a broad new agreement on trade rules in the Uruguay Round of the General Agreement on Tariffs and Trade (GATT). Conservative estimates show that if the pending agreement is implemented, it will stimulate world economic growth by adding over \$200 billion annually to global output (Nguyen, Perroni, and Wigle).

A principal objective of the Uruguay Round is to update global rules covering traditional trade policies, such as tariffs, quotas, and export subsidies. More important, the pending agreement will also bring under multilateral GATT disciplines for the first time broad areas of commercial regulations that influence trade. Such areas as restrictions on services trade, foreign direct investment, and intellectual property rights are playing an increasingly important role in world trade. Moreover, unless suitable agreements on these emerging trade issues are reached in the GATT, they are likely to become the principal cause of future trade disputes.

Of these important new trade issues, intellectual property rights, or IPRs, play a critical role in economic growth and development. Intellectual

property rights are patents, trademarks, and copyrights that grant exclusive rights to sell new products and thereby give incentives to undertake innovative research and creative activity. Currently, IPRs offer levels of protection that differ sharply across countries. In general, IPRs are strongest in developed countries and weakest in developing countries. As a group, developed countries are concerned that unequal protection of intellectual property results in a significant loss of revenue through unauthorized imitation and copying in various countries. In contrast, many developing countries feel that stronger IPRs would increase the costs of acquiring new technology and thus significantly raise the price of consumer products. This conflict underlies efforts to develop an international agreement on IPRs as part of the Uruguay Round.

This article examines the growing prominence of intellectual property rights in trade policy and discusses the likely outcome of an IPR agreement in the Uruguay Round. The first section of the article provides an overview of IPRs and presents evidence of their importance in international trade. The second section describes international differences in IPR policies and examines both the costs of these differences and the potential results of increased harmonization. The third section describes the likely form of an agreement on IPRs resulting from a successful completion of the Uruguay Round.

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AN OVERVIEW OF INTELLECTUAL PROPERTY RIGHTS

Intellectual property rights are policies that assign and protect the rights to earn income from innovative and creative activity. IPRs provide legal authority to control the dissemination and commercialization of new information and ideas and to enforce sanctions against their unauthorized use. IPRs play a critical role in economic growth and development because they affect the profitability of industrial research and the rewards to creative activity. At the same time, IPRs are controversial because stronger protection of property rights may come at the expense of higher prices and reduced availability of products. With the growth of world trade and increased foreign direct investment in the 1980s, IPRs have become a central issue in trade policy.

Types of intellectual property rights

There are two general types of intellectual property. Industrial property refers to inventions of value to industry and commerce. Artistic property relates to artistic and literary works, such as books, pieces of art, filmed works, and recorded music. While most goods and services are easily classified into one of these two categories, certain new technological innovations fall between these traditional categories and do not yet have a standardized classification.

Industrial property. Protection of industrial property takes several forms. A patent grants a temporary exclusive right to make, use, sell, and import a new product, or to adopt a new process and control production and use of items made from the new process. To receive a patent, an invention must be previously unknown, contain a nonobvious step, and be industrially useful.¹ While many industries rely on patents to earn returns on their research and development (R&D) programs, patents are especially important in pharmaceuticals, chemicals, and machinery.

Industrial property may also be protected through the registration of distinctive marks for products and firms, including trademarks, service marks, and trade names. A trademark or service mark is a distinctive symbol that identifies the producer of a good or service. It may be a pictorial emblem, a single letter or numeral, a phrase or sentence, or any combination. Trade names identify a full enterprise rather than specific goods or services. Generally, registration of marks is required to earn protection from infringement, such as duplication of marks or the use of confusingly similar marks. A few countries, such as the United States, also recognize the commercial use of a new and distinctive mark as sufficient to warrant protection without prior registration. Virtually all goods and services are marketed under trademark protection.

Similar protections extend to industrial designs and indications of source. Industrial designs are the distinctive and aesthetic aspects of product style and packaging. Indications of source signify a geographical region of origin and identify product characteristics specific to that region. Most often, these identify the geographical origins of wines and spirits.

Industrial property is further protected in many countries by domestic laws against unfair business competition. The definition of "unfair competition" varies across countries but may cover a large number of business practices, including industrial espionage, dumping, bribery, and disclosure of technical information. The most significant protection is provided to trade secrets, which are unpatented proprietary technical knowledge, such as a chemical formula. Many firms consider trade secrets an important form of strategic competition, and thus legal protection from unauthorized disclosure is seen as crucial.

Artistic property. Artistic property is protected by copyrights and related mechanisms. Copyrights give an exclusive right to exploit the expression—such as a book, recording, or film—of an idea rather than the idea itself. Thus, with limited excep-

tions, artistic expressions cannot be copied without authorization. The creator's protection, however, does not extend to the idea of writing a biography or painting a particular scene. To be copyrighted, the expression must be an original creation of the artist or author, regardless of the quality of the work. Further, the expression must be placed in tangible form, such as a book or recording, before it can be protected.

Copyrights may extend to "moral rights," which give the creator the right to prevent later distortions to his work after its rights have been sold. A growing number of countries also grant "neighboring rights," which protect performers and broadcasters from unauthorized reproduction and communication of their work.

New issues. Questions have emerged in recent years about the ability of traditional IPRs to protect certain kinds of technological innovation. For example, many countries protect computer software with copyrights, since programs are tangible expressions of creative ideas. However, programs may be easily imitated without necessarily violating traditional copyright laws by rearranging lines in the programming code. For this reason, the United States and the European Community have moved toward providing stronger protection based on patent principles.²

Similar issues are involved in the design of computer chips and databases. Because the designs of computer chips are easily copied, most developed countries have established a unique form of protection that combines copyright and patent principles. For information databases, on the other hand, copyrights may simply protect the order of the data, which is easily changed without violating the law. The loose protection for databases may call for stronger protection.

Significant questions also arise over the patentability of biotechnological innovations, such as new microbiological plants and animals with industrial value. Some observers have argued that it is unethical to provide exclusive rights to exploit living organisms, even if they were developed by

creativity. Among industrialized nations, however, a consensus has emerged that such organisms are patentable, which has helped spur the development of the biotechnology industry.³

THE ECONOMICS OF INTELLECTUAL PROPERTY RIGHTS

Because technological advance is a major determinant of the growth of economic activity and living standards, countries have an interest in promoting creative work. In doing so, however, policymakers face difficult tradeoffs between the need to promote innovation and the need to ensure wide dissemination of new information. IPRs provide a reasonably balanced, but decidedly imperfect, solution to these problems.

The act of innovation incurs development costs and runs risks that the outcomes will not succeed. Without compensation for these costs and risks, incentives for such work are absent. Private markets frequently cannot provide this compensation. If an innovation has economic value but is also easily imitated, competing firms would copy and sell it, earning a share of the potential profits. In perfectly competitive markets, enough duplication would emerge to eliminate all profits.⁴ Expecting this outcome, innovative firms would not undertake the research and development in the first place. Societies would lose the benefits of new technology development, product variety, and cultural enrichment. Over time, economic growth would be dampened.

Intellectual property rights attempt to correct this problem by providing an exclusive right, or monopoly, to the innovative firm to sell or use the product or technology.⁵ Patents, trademarks, copyrights, and other IPRs limit market access to the innovation and raise its price. In principle, they are designed to enable the inventor or creative artist to cover development costs plus earn a normal profit.

At the same time, IPRs impose costs to society that must be balanced against these gains. The

higher prices resulting from IPR protection may reduce the availability and affordability of products incorporating new technology. For example, the high prices of some patented drugs may limit their availability. Thus, by providing a monopoly, IPRs substitute the current market failure of restricted supply in order to overcome the future market failure of inadequate innovation. The current welfare losses from protecting intellectual property may be viewed as society's investment in promoting creative activities.

The existence of this tradeoff complicates the choice of appropriate levels of IPR protection. If protection is too weak, innovation and creative activity may be discouraged. If protection is too strong, excessive market power through restricted supply may be created.

The choice of appropriate protection levels is further complicated by measurement problems. In principle, IPRs should be set so that monopoly profits exactly compensate firms for R&D costs, including some provision for risk. To determine the best protection level for each potential innovation, policymakers would need to know a variety of technical and market parameters, such as how easy unauthorized duplication might be, how competitive the industry is, how important a new technology will be in lowering costs in other industries, and how responsive demand is to price changes. But in practice, information this detailed is impossible to obtain.

Existing IPRs reflect a balancing of these difficulties. Because of measurement problems, IPR protection is standardized by property type rather than tailored to specific products. These standards, in turn, reflect a compromise between the need to invent new products and the need to use them.

The U.S. systems of patent and trademark protection provide good examples of these tradeoffs. American patents generally last for 17 years from the date of application.⁶ For many products and technologies this period is longer than that needed to pay back R&D costs, suggesting that excessive market power is created. Furthermore,

a patent may prove socially damaging if the firm owning it chooses not to license a key technology or product very widely. At the same time, however, U.S. patents are relatively narrow in specifying the precise characteristics of an invention that are protected from imitation. Patent applications must include detailed descriptions of the new technology embodied in a product or process. These descriptions are published in order to promote the diffusion of the technologies to firms hoping to improve on them without violating the terms of the patent protection. The narrow scope of patent applications encourages widespread use of new technical information. But, by providing weak protection, the narrow scope may also limit incentives for innovation. Thus, the balancing of length and breadth of patent protection represents a compromise between the need to invent new products and the need to use them.⁷

Trademark protection reflects a similar compromise. Trademarks benefit society by encouraging the development of new products and increasing product quality. If consumers consider a trademark to be a dependable indicator of high quality, they will be willing to pay a premium price for the goods it designates because they are saved the expense of searching for quality. To sustain this premium, firms must work to maintain a constant or improving degree of quality and to introduce new products under the trademark. Thus, trademarks protect the reputations of firms and induce greater variety in product development. If competing firms were allowed to use the same, or confusingly similar, marks in selling their products, the original firm's market reputation would suffer and the rate of introduction of new goods could be diminished.

At the same time, trademarks impose costs by protecting monopoly profits in certain brands. Examples include consumer items, such as cosmetics, athletic shoes, watches, and over-the-counter drugs. For these goods, prices are typically much higher than current production costs, making them vulnerable to imitation. Furthermore, the

existence of trademarks may encourage excessive spending on advertising and differentiation of products. Critics argue that these problems make trademarks less desirable than other forms of IPRs, especially in low-income nations.

The terms of trademark protection also balance the length and breadth of protection.⁸ Because firms are expected to live indefinitely, trademarks can be reregistered without limit. This permits a permanent monopoly on the use of a particular emblematic designation but does not prevent other firms from designing distinctive marks for their competing goods. Because the potential supply of such marks is limitless, permanent registration is unlikely to restrain trade seriously.

The importance of IPRs in international business

The 1980s saw an enormous expansion in world trade that elevated IPRs to new prominence in trade policy. Innovative firms turned increasingly to foreign markets to earn economic returns on their intellectual property assets. Thus, trade increased considerably in products and services protected by patents, trademarks, or copyrights. In addition, many firms chose to invest directly in overseas production facilities and service markets through local sales of products produced with a protected technology.⁹ Other firms sold or rented licensing rights to produce goods under their trademark or copyright to both affiliates and unrelated firms in foreign countries.¹⁰

It is difficult to measure directly the importance of IPRs in world trade. Rough estimates can be made, however, by examining the value of goods and services that contain a strong IPR component and by looking at international flows of royalties and license fees. These data show that IPR-related trade is very important to both developed and developing countries. At the same time, because countries differ in comparative trade advantages and in their stage of economic development, they may be led to support very different

types and levels of IPR protection.

IPRs are particularly important for industrialized countries, such as the United States and Japan. In 1989, the United States exported some \$58.8 billion and imported some \$87.9 billion in a limited set of products that embody a prominent component of IPRs (Table 1).¹¹ In comparison, U.S. trade in all agricultural products in 1989 amounted to \$35.2 billion in exports and \$24.9 billion in imports.¹² Furthermore, these products are important components of aggregate trade. Exports and imports of the goods in Table 1 were 16.1 percent and 17.8 percent of total U.S. merchandise exports and imports, respectively. Similarly, Japanese imports and exports contain a high proportion of these goods.¹³

IPRs are also a significant factor in the trade of developing countries. For example, while Brazil's trade in IPR-intensive goods was substantially smaller in absolute terms than in the United States and Japan, its imports of these goods still amounted to 13.1 percent of its total imports (Table 1).

Another rough measure of trade in intellectual property is the flow of receipts and payments on technology trade. These are defined as royalties and license fees for the use of technological information, such as patented processes and new products under patents and trademarks. By this measure, the United States remains the overwhelming net world supplier of technology, with a significant inflow of payments (Table 2). In contrast, both highly industrialized Japan and less-industrialized Spain make net payments for licensing foreign technologies.¹⁴

The data also suggest that because countries differ in the relative presence of IPRs in their imports and exports, they might prefer different international IPR regimes to protect their interests. Indeed, countries with a strong net export position in a specific sector generally support strong IPR protection in export markets to prevent unauthorized copying and imitation. In contrast, countries that rely heavily on imported technology typically

Table 1

Exports and Imports for Selected Countries in Certain Goods Sensitive to IPRs, 1989
(Millions of dollars)

IPR type	United States		Japan		Brazil	
	Exports	Imports	Exports	Imports	Exports	Imports
Patent goods	26,784	22,305	23,607	7,055	1,081	1,547
Copyright goods	13,989	13,663	10,613	2,911	51	268
Trademark goods	18,022	51,095	13,005	11,658	833	589
Total (billions of dollars)	58.8	87.9	47.2	21.7	2.0	2.4
Percent of total	16.1	17.8	17.1	10.2	5.8	13.1

Note: Patent goods include pharmaceuticals, plastics, special machinery, machine tools, automatic data processing equipment, electrical medical equipment, and measuring instruments. Copyright goods include semiconductors, books and magazines, and sound recordings and blank tapes. Trademark goods include alcoholic beverages, cosmetics, auto parts, furniture, luggage, clothing, and watches.

Source: United Nations, *Yearbook of International Trade Statistics*.

prefer weaker protection to increase the affordability and availability of products. Also, protection levels tend to be low in the poorest countries and tend to rise with the state of economic development.¹⁵

Highly industrialized countries like the United States and Japan have similar interests in strong IPR protection. For example, the United States has a strong comparative advantage in producing many patent goods, such as pharmaceuticals, plastic products, automatic data processing machinery, and measuring instruments, as well as in some copyright goods, such as printed matter and sound recordings. The main intellectual-property interest of U.S. firms in these sectors lies in strengthened foreign measures to prevent local copying and imports of infringing goods from elsewhere. Japan also has comparative advantages in most of the patent-intensive goods and, in addition, is a strong

net exporter of copyright goods (especially semiconductors).¹⁶ As a result, Japan has a relatively strong interest in foreign laws preventing the unapproved duplication of computer chips and recordings.

With a comparative disadvantage in many trademark goods, such as alcoholic beverages, furniture, luggage, and clothing, the United States might be expected to be less concerned with IPR protection in these areas. Production-location decisions in these goods depend largely on such factors as the abundance of grape-growing land and availability of unskilled labor. Thus, the United States tends to import them. Nevertheless, as suggested in Table 2, ownership of the trademark may well reside in countries that do not produce the products. Thus, American firms owning trademarks in these sectors would favor foreign laws to prevent production and export of goods imitating those trademarks as well as U.S. border measures to

Table 2

Receipts and Payments and Balance on Technology Trade, 1988*(Millions of dollars)*

<u>Country</u>	<u>Receipts</u>	<u>Payments</u>	<u>Balance</u>
United States	10,858	2,054	8,804
Japan	1,956	2,480	-424
Spain	187	1,416	-1,229

Source: Organization for Economic Cooperation and Development, *Basic Science and Technology Statistics*.

deter such imports.

Less-industrialized countries such as Brazil may have different interests. Brazil's trade pattern demonstrates the typical situation for a developing country. In most patent-intensive goods, Brazil has clear disadvantages because of a limited technological base relative to the industrial nations. But in some goods subject to trademark protection, such as furniture, luggage, and clothing, it has net-export positions. Brazilian firms currently may perceive some advantage in having laws that weakly protect the intellectual property of foreign competitors, allowing local firms to imitate foreign goods and technologies. Over time, as Brazil's technological sophistication and per capita incomes grow, the country could see greater advantages to establishing stronger laws.

INTELLECTUAL PROPERTY RIGHTS AS A TRADE ISSUE

As suggested by the data on trade and income flows, protection of intellectual property rights varies widely across countries.¹⁷ These differences may be costly both to the international trading system and to individual firms. Attempts to harmonize IPR policies, however, must reflect differ-

ing weights attached to the tradeoff between growth and product availability.

Differences in international policy regimes

The widespread support of IPRs in industrial countries reflects the belief that IPRs provide future benefits that will outweigh current monopolization problems. The use of patents, copyrights, and trademarks, for example, can enhance economic growth and more closely match consumer preferences by increasing product variety and quality.

Rapidly industrializing nations, such as Mexico, Korea, and Turkey, also have compelling interests in upgrading their protection of property rights. These countries are building technological capabilities and labor skills. Stronger IPR protection would assist their economic development by ensuring access to foreign technologies and promoting expanding domestic innovation. Indeed, many industrializing nations have enacted stronger IPR legislation since 1986, in part because of this recognition.

The least-developed nations remain wary of providing strong IPRs. Because these countries have little domestic capacity for technological innovation and product development, they rely on

imports of these items for growth. They fear that providing stronger patents to foreign firms and enforcing laws against domestic imitation would raise prices for key inputs and consumption goods while simply transferring profits outside the country. At least for some time, few long-run benefits would emerge to offset these short-run costs.¹⁸

Differences in IPR policies have led to significant trade disputes in at least four areas. First, it has been common in numerous countries to allow domestic firms to engage in counterfeiting, or "piracy." For example, bootleg copies of copyrighted movies and tapes are sold without permission, and consumer goods are marketed with the unauthorized use of prominent foreign trademarks. The temptation to do this is great, given the large gap between the price of, say, a legitimate perfume or luxury watch and its actual cost of production. The counterfeit goods are typically cheaper and of lower quality, which provides some benefits to lower income consumers so long as the products do not endanger public safety.¹⁹ However, firms owning the trademark suffer lost sales and a diminution in their reputation for quality to the extent that consumers are confused about the actual origin of the goods.

Second, most developing countries and several industrial nations restrict the patentability of pharmaceutical drugs. Because drugs can be copied so easily, pharmaceutical firms depend critically on patents in major markets to recover their substantial R&D costs. Such patents, however, often result in high prices for some medicines, reducing their affordability. As a matter of social policy, many countries see little sense in allowing foreign drug firms to charge similarly high prices in their markets. This is especially true in developing countries where purchasing power is low, government budgets are constrained, and local firms have limited ability to invent around drug patents legitimately. To keep drugs affordable, these governments frequently adopt policies that combine limited or no patentability for drugs,

compulsory licenses, and price controls.²⁰ Most countries allow firms to patent their pharmaceutical processes, as opposed to *products*, but this is of limited value to foreign firms because they find it hard to prove infringement of a chemical process.

Third, countries differ in their protection of computer software. The United States and the European Community have begun to grant patents for key industrial applications, which is such a strong standard that it invites concern over monopolization of information technologies. Most other industrial and middle-income nations agree on the need for copyright protection, which, as noted earlier, may not be strong enough in some instances. Few poor nations have provided such protection yet, which explains the prevalence of program piracy in certain markets. Again, the reason is simply that it is cheaper to disseminate software through copying, even at the risk of encouraging low-quality imitation programs and viruses.

Fourth, patent procedures differ greatly, even among industrial nations. Only the United States awards patents to the entity that can prove it was the first to invent a technology or product. This policy is supposed to encourage early disclosure and professional scrutiny of new discoveries in the technical literature without fear by inventors that publication will allow someone else to procure the patent. All other developed countries, however, award patents to the entities that are first to file for them. This avoids disputes over who actually developed the innovation but tends to encourage excessive filing for patents to cover an entire range of potential discoveries. This practice is perhaps most noticeable in Japan, where firms apply for many more patents per capita than in other markets.²¹ These differences in policies can be critical to firms in choosing their strategies for patenting and disclosing technical information.²²

Costs of differing levels of IPR protection

Differences in the protection of property rights impose potentially significant costs on the interna-

tional trading system and on private businesses. Unfortunately, reliable information on the magnitude of these costs is not yet available. The social costs are inherently difficult to measure, while industry and academic estimates of private costs are quite different.

Social costs. Differing levels of protection for IPRs can impose costs on the international trading system in at least three ways. First, different regimes covering the specification and enforcement of patents, trademarks, and copyrights may distort decisions about whether to trade with specific markets and to invest in specific countries or to transfer technology to them.²³ The aggregate costs from such distortions could be significant.

Second, in a long-run sense, different IPR policies may cause decisions regarding technology and product development to be made on the basis of available protection, rather than expected demand in different markets. This would represent an inefficiency in the international allocation of R&D and marketing resources. Indeed, there may be an underinvestment in projects to develop products for consumer needs in developing countries with limited protection. The prototypical example is the relative scarcity of drugs to combat tropical diseases. Enhanced patent protection in those countries could induce foreign pharmaceutical firms to undertake more efforts in that direction.

Third, differences in IPR protection may be the source of trade disputes. To the extent that these disputes are unresolved and lead to compensating tariffs and other trade barriers, they may result in higher costs for goods and services worldwide.

Private costs. Differences in IPR policies may also impose costs on specific businesses and industries. For example, in recent years, U.S. and European firms have become increasingly concerned that these differences were eroding their potential sales and profits from innovation. One problem is that it is costly to apply for, and keep in force, patents and trademarks in many countries with differing procedures. Thus, the variability in

IPRs acts as an additional cost to firms.

Of greater concern is infringement activity. Perhaps most obvious is foreign counterfeiting, where firms in other countries produce, sell, and export products that falsely display prominent trademarks and copyrights. Equally worrisome is the loss associated with weak foreign patent protection in areas such as pharmaceuticals and food products.

Adding to the importance of this issue are new areas in which IPRs have become prevalent. Computer software, semiconductors, and biotechnological products all require substantial creative effort that calls for protection. The potential for sales and income growth over the next decade is tremendous, lending urgency to the IPR problem.

There is little reliable information on how extensive economic damages from foreign infringement of IPRs might be. The most systematic evidence comes from a 1988 study by the U. S. International Trade Commission. This survey asked several hundred American firms to estimate their lost sales, royalty fees, and the like from foreign IPRs infringement in 1986. In total, firms reported losses of \$24 billion.

Unfortunately, such reports are not very credible. Firms may be expected to overestimate their losses because they are likely to believe that, given better foreign protection, their sales would fully replace infringing sales. This would not be the case, however, if greater IPR protection resulted in significantly higher prices charged by the rights-holding firms.

In contrast to industry estimates, recent academic studies report lower costs.²⁴ For example, Feinberg and Rousslang report that U.S. firms suffer infringing sales ranging from 2.8 to 14.3 percent of worldwide sales, depending on the industry. Summing across industries, they found that infringing sales amounted to \$9.5 billion in 1986.

Perhaps more important than lost sales are foregone profits. Under a variety of assumptions about R&D and production costs and about competition between firms that own intellectual prop-

erty and firms that imitate without authorization, lost profits to innovative firms are estimated to range from \$1.3 billion to \$2.6 billion (Maskus 1990a). In a study of the impacts of pharmaceutical patent infringement in Mexico, Argentina, Brazil, and India, it was estimated that pharmaceutical firms worldwide have lost perhaps \$167 million to \$1.5 billion annually in profits due to sales of imitated drugs in those countries (Maskus and Eby-Konan).

Thus, it appears that damages to innovative firms from foreign infringement of IPRs may be substantially less than the firms themselves report. Nevertheless, public concern over such infringement is understandable in light of two facts. First, these losses are unevenly distributed across firms. The greatest damages are expected in the pharmaceutical, chemical, software, luxury-goods, and entertainment industries, because these products are easily imitated or copied. Indeed, firms in these industries have been at the forefront in lobbying for changes in foreign protective regimes. Second, the social costs from IPRs infringement may be large. Current losses in profits in the pharmaceuticals industry, for example, may reduce the scale of firms' R&D programs, thereby delaying or deterring the introduction of new drugs.

Harmonization of intellectual property rights?

The international differences in property right protection have led the United States and other industrialized nations to push for greater uniformity of treatment. Unfortunately, there is no guarantee that full harmonization would be globally optimal. Indeed, resolving differences in IPR protection is likely to involve a compromise between the interests of developing and developed countries.

The United States is the strongest advocate of a globally harmonized set of IPRs in all countries.²⁵ These standards would provide strong protection for innovative firms from any country,

without discrimination, and would serve to eliminate the bulk of international infringement. The ability of countries to limit the value of IPRs for domestic purposes, by issuing compulsory licenses without full monetary compensation, for example, would be severely curtailed. Such policy changes could result in global economic benefits.²⁶

The case for full harmonization is difficult to make, however. Standardizing regulations at strongly protective levels would bring about both benefits and costs that would be shared unevenly by trading partners. Stronger international protection may benefit firms in industrial and rapidly growing economies but cause problems in developing nations, at least for a lengthy period of time. Thus, there is no general expectation that all nations will necessarily gain or lose from harmonization.

In this way, harmonization of IPRs differs greatly from liberalizing traditional trade barriers, such as tariffs and quotas. Trade barriers are themselves market distortions that interfere with the efficient functioning of markets. While there are winners and losers within each country, economists generally agree that trade barriers harm both the country that imposes them and its trading partners. Removing them raises global income by improving economic efficiency. All countries may be expected to share in the resultant gains from greater trade (Nguyen, Perroni, and Wigle).

In contrast, intellectual property rights attempt to address the inherent failure of markets to reward innovation, but do so by imposing the additional distortion of a monopoly on the flow of new information. Each country's interests in such policies depend on a host of national characteristics, including its innovative capacity, its ability to absorb foreign technology, and its preference for quality in consumption. Within each country innovative firms would gain from harmonization, while users of products would suffer higher costs. Overall, highly innovative countries would gain, while poorer countries would experience net losses (Maskus 1990b).

Even recognizing this tradeoff, however, the

possibility remains that global income and growth could rise after partial harmonization. As discussed above, the existence of different IPRs across countries may impose damages on the international trading system. Reducing these differences could lower these costs. Moreover, to the extent that the world currently allocates too few resources to innovation, a global expansion of investment in research and development could raise world income.²⁷

Nevertheless, countries that mainly import their technologies and new products would experience losses from such a change, at least for some period of time. These losses would result from higher monopoly prices, the loss of profits shifted from domestic firms to foreign firms, the absence of local innovation, and perhaps less access to foreign technologies.

It follows that for any prospective agreement on IPRs to gain widespread participation, it must represent a compromise between the current ineffective and discriminatory regime on the one hand, and full harmonization with rigorous levels of protection on the other hand. Furthermore, if there are overall global gains from strengthening and reducing differences in policies, a case can be made for winners to compensate losers to secure their participation. An ideal forum for this framework to emerge is through the multilateral negotiations underway in the Uruguay Round of the GATT.

ACHIEVING A MULTILATERAL AGREEMENT ON IPRS

Negotiations on intellectual property rights in the Uruguay Round suggest that a compromise may be reached that is fair to different national interests and provides a more effective framework for enforcement. Moreover, there are substantial risks to the world trading system if the Uruguay Round fails to reach an agreement, leaving the existing policy regime in place.

Existing institutional arrangements do not provide an effective forum for settling IPR disputes, nor do they provide means of enforcement.

Prior to the Uruguay Round, the international body responsible for handling IPRs was the World Intellectual Property Organization (WIPO), an arm of the United Nations. A number of international conventions and treaties exist covering industrial property, artistic creations, and special issues, such as biotechnology and semiconductors.²⁸

While these conventions provide some basic requirements and allow some international cooperation, the WIPO structure suffers three fundamental shortcomings. First, not all countries are members of the conventions. Second, the prevailing policy principle in WIPO is national treatment, which requires countries not to discriminate between domestic and foreign firms in its IPRs. However, this principle does not prevent the level of protection from being weak if a particular country so desires. Third, even if a country violates this nondiscrimination principle, WIPO has no effective means of resolving resulting disputes among countries. Thus, WIPO exercises little control over the practices of different nations, which encourages varying IPRs and discriminatory enforcement.

The Uruguay Round negotiations on intellectual property have resulted in a prospective agreement that overcomes many of these problems. It would abandon the existing international structure by placing IPRs within the purview of GATT obligations. This implies that countries would be expected to enforce their policies without discrimination and that disputes could be settled in an accepted international forum.

The prospective agreement reflects a spirit of compromise between the interests of developed and developing countries. Nearly all countries would agree to eliminate counterfeiting over some period, consistent with the view that unauthorized use of a published trademark or copyright is illegitimate. At the same time, widespread agreement has been reached on the need to establish a stronger set of minimum standards in patents that provide some flexibility to countries at different levels of development. In addition, poorer countries would be allowed to bring their IPRs up to

international standards gradually, as their circumstances warrant. Technical and financial assistance would be provided by developed nations to help such countries expand and enforce their systems over time. Domestic competition policies would be upgraded to discipline any potential undesirable monopoly practices by firms owning IPRs. In return, countries would agree to minimize the use of compulsory licenses and agree to pay market-based compensation when they are used.

The likelihood of an agreement on IPRs in the Uruguay Round is enhanced by the comprehensive nature of the overall negotiations. The wide scope of the Uruguay Round promises greater market access in developed countries for the products of developing countries that are being asked to strengthen their IPRs. Such products would include textiles, apparel, and agricultural goods. Moreover, if agreement is reached in the Uruguay Round to set and enforce stronger mechanisms for settling trade disputes, developing countries would feel more confident their future grievances against the wealthier nations would receive a fair hearing.

The importance of developing an IPR agreement in the GATT talks is reinforced by considering the risks to the world trading system if the Uruguay Round fails to reach an agreement, leaving the existing policy regime in place. For example, as firms take an increasingly global outlook to their strategic business decisions, the effects of national regulations covering competitive conditions around the world will become more significant. Governments may choose to use differential policies to engage in "regulatory competition" for business, risking the artificial fragmentation of world commerce. Multilateral disciplines to restrict this competition are important.

More important, many countries, such as the United States, view foreign infringement of their national IPRs as unfair trade actions. Accordingly, unilateral actions against countries with weak IPRs will continue to proliferate. Indeed, in the 1988 Omnibus Trade Act the United States elevated intellectual property laws to a special status

for attention in its efforts to discipline foreign practices. Under this "Special 301" provision, the U.S. trade representative is empowered to identify countries with policies that seem especially damaging to American business interests and to impose retaliatory trade restrictions if bilateral negotiations fail to remove them. There is some justification in this procedure if it succeeds in modifying unjustifiable foreign practices and results in greater and nondiscriminatory market access. However, such unilateral actions ultimately threaten the integrity of the international trading system by substituting bilateral deals for multilateral disciplines.²⁹

SUMMARY

The current Uruguay Round negotiations represent a watershed in international trade policy. While successful completion of the Uruguay Round will include progress in resolving traditional issues such as tariffs and quotas, newer trade issues such as intellectual property rights will be addressed for the first time.

With the growth in world trade in the 1980s, international differences in protection of IPRs have caused an increasing number of trade disputes. From a policy standpoint, IPRs are fundamentally different from traditional trade barriers, such as tariffs. Whereas reducing global levels of tariffs would provide welfare gains for all countries concerned, strengthening and harmonizing IPRs would generate benefits and costs that are likely to vary across countries. Thus, an appropriate agreement will involve a compromise between the current situation of markedly different protective regimes and a fully standardized set of international policies.

Successful completion of the Uruguay Round will go a long way toward settling IPR disputes. The prospective agreement on IPRs includes considerable compromise between the interests of developed and developing countries. In addition, by placing future negotiations in the multilateral framework provided by the GATT, potentially damaging bilateral disputes may be avoided.

ENDNOTES

¹ The last criterion prevents the patenting of basic scientific discoveries deriving from fundamental laws of nature. Under most legal systems, there is an unclear demarcation between "fundamental" and "applied" discoveries that is becoming controversial in patent policy. For example, the United States has indicated its willingness to provide patents for discoveries emanating from the mapping of genes in the DNA molecule. This policy concerns observers who believe such information should be widely disseminated in order to spur development of practical applications.

² This trend has raised concerns about potential monopolization of key software, limiting the development of compatible applications programs.

³ For additional details on intellectual property rights, see World Intellectual Property Organization (1988).

⁴ A new technology, for example, is information about a better means of production. Information is a type of good for which consumption by one firm does not limit the ability of other firms to use it. In economic terms, once the technology has been introduced, it makes the most sense to provide it to all potential users at the cost of replicating another copy of a blueprint or computer program. This cost may be near zero. In this sense, an efficient market would allow innovations to be distributed and used competitively, without consideration of the initial R&D costs.

⁵ Two exceptions exist to the provisions providing exclusive rights. First, a government may choose to develop and disseminate an invention itself on grounds of public interest. Second, a government may require that a patent owner allow use by another firm to expand domestic availability of the invented product or process. Such "compulsory licenses" usually provide a fixed payment to the patent owner.

⁶ Among industrial countries the term of patent protection lasts from 15 to 20 years. This standard was established centuries ago in Europe, based on the length of time it required to train two apprentices. It should be noted that effective patent lengths can vary across industries because it may take patent authorities different periods of time to approve the applications. Thus, until recent legislative changes a U.S. pharmaceutical patent typically provided only ten years of protection due to the lengthy approval period.

⁷ Most observers consider this basic framework to be the best choice for a technology-development policy. One alternative, for example, would be for the government to subsidize applied and commercial R&D directly. The difficulty here is that the government is ill-qualified to determine which projects are likely to succeed and advance the national technological base. Further, such policies risk problems of awarding contracts based on political favoritism and foreign retaliatory

subsidization. The patent system has the advantage of allowing market competition for protected future profits to allocate R&D resources among firms. A proper allocation of labor and capital into technologically dynamic uses is critical for promoting economic growth, as discussed by Grossman and Helpman (1991).

⁸ Similar comments pertain to copyrights, which allow authors, musicians, and artists to earn (sometimes spectacular) returns on their creative efforts by controlling the duplication and sale of books, tapes, and the like. Without these potential returns there would be slower creation of cultural products and technical manuscripts. However, concerns arise that strict copyright protection may excessively restrict the diffusion of knowledge gained from literary and artistic work. An example would be the difficulty students might experience in affording expensive technical publications that carry significant research results. Copyrights are typically awarded for a time period extending 50 years beyond the author's death, which again is a compromise among these conflicting interests.

⁹ Maskus (1990b) provides evidence on the growth of foreign direct investment.

¹⁰ Horstmann and Markusen (1987) analyze the strategic choices among these alternatives.

¹¹ Many goods and services that rely on IPRs are excluded from Table 1 due to data limitations. For example, there is substantial international trade in computer software and banking services.

¹² Indeed, some portion of agricultural trade is related to intellectual-property inputs. For example, U.S. export strength in farm goods depends in part on the use of advanced chemical and mechanical inputs, which are likely to be protected by patents. Further, food products carry trademarks and are often patented as well. These examples provide a flavor both for why IPRs are pervasive in trade and why it is virtually impossible to measure accurately their contribution to trade.

¹³ It should be noted that trade in most IPR-sensitive goods has risen rapidly in recent years. For example, between 1985 and 1989 U.S. nominal exports of patent-intensive goods rose by 82 percent, and of imports by 75 percent, in comparison with growth in overall merchandise exports of 66 percent and in imports of 36 percent. Japan's imports of all three types of IPRs-sensitive goods rose by more than 100 percent over that period, while that country's total imports rose by 63 percent.

¹⁴ Clearly, only some unknown portion of the income flows noted in Table 2 reflects returns to innovative activity. This portion would depend on numerous market and policy

variables, including the international strength of IPRs. Nonetheless, it is evident that foreign direct investment and licensing are significant forms of international business and that intellectual property plays a key role in global competition.

15 This varies among patents, trademarks, and copyrights. See Rapp and Rozek.

16 In fact, in developed countries semiconductors receive a hybrid protection combining patents and copyrights.

17 World Intellectual Property Organization provides a compilation of practices in most countries. Gadbow and Richards comprehensively review policies. However, because many countries have changed IPRs recently, their review is somewhat dated.

18 Maskus (1990b) provides some tentative estimates of these potential static costs.

19 There is a thriving market in some countries for counterfeit medicines (drugs sold falsely under trademark), some of which might be produced without proper quality controls.

20 Many products besides pharmaceuticals may not be patentable in various countries. Primary examples include biotechnological inventions and food products. See WIPO (1988) and Butler (1990) for more details.

21 Some observers claim that the Japanese patent system is discriminatory and acts to reward Japanese inventors to the exclusion of foreign inventors. Reasons for this include requirements for translation into Japanese and an understaffed patent office that delays processing of applications. At the same time, however, the United States has been accused of using its statutory authority to exclude IPR-infringing products from its market to discriminate against foreign firms.

22 Beyond the patent stage, countries differ in how they regulate business practices by patentees. The U.S. judicial system has been relatively rigorous in insisting that patent owners do not operate to restrain trade and technology diffusion, though this policy stance has softened recently. Such competition policy in the European Community and Japan has been more lenient toward firms owning IPRs.

23 While this statement is presumably true, it must be noted that a business could react in a variety of ways to differential IPRs, depending on market power and strategy.

In principle, the effect on total trade and investment would be unclear, though there would be distortions in the distribution of those flows.

24 Studies that attempt to account for the competitive structure of markets for IPR-sensitive products include Feinberg and Rousslang (1990), Maskus (1990b), and Maskus and Eby-Konan (1993).

25 It would be more accurate to suggest that the U.S. preference is for such standards to exist in all but the least-developed countries, where infringement is insignificant in economic terms.

26 Uniform international IPRs would allow their owners to charge different prices in various markets (to "price discriminate" in economic terms), depending on demand elasticities. This outcome would increase the returns to innovation and, presumably, induce more R&D and growth. In general, if harmonized standards were to represent a net strengthening of world IPRs, as envisioned by the United States, profits to creative activity would rise and more innovation would take place.

27 There is some evidence that in that in developed countries the social returns to innovation (counting consumer benefits from new products and technologies, including technological spillovers to other industries) exceed the private returns, Organization for Economic Cooperation and Development.

28 An example is the Patent Cooperation Treaty, which allows firms to apply to a centralized body, the decisions of which are recognized as valid in all signatory countries. Such protocols are limited, however, and, in any event, the protection provided in various nations may still differ.

29 That this process is likely is clear from a recent report that intellectual-property interests in the United States have tired of the lengthy delay in reaching a Uruguay Round accord. Petitions for investigation of, and eventual retaliation against, practices in several countries may be filed by the Pharmaceutical Manufacturers Association and the Motion Picture Association of America. It must be recognized that, in the long run, a full multilateral agreement would be a significantly better approach to meeting their concerns and improving world welfare and growth.

REFERENCES

- Butler, A. 1990. "The Trade-Related Aspects of Intellectual Property Rights: What Is at Stake?" Federal Reserve Bank of St. Louis, *Review*, pp. 34-46.
- Feinberg, R., and D. Rousslang. 1990. "The Economic Effects of Intellectual Property Rights Infringements," *Journal of Business*, pp. 79-90.
- Gadbaw, M., and T. Richards, eds. 1988. *Intellectual Property Rights: Global Consensus, Global Conflict?* Boulder, Colo.: Westview Press.
- Grossman, G., and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. Cambridge, Mass.: MIT Press.
- Horstmann, I., and J. Markusen. 1987. "Licensing versus Direct Investment: A Model of Internalization by the Multinational Enterprise," *Canadian Journal of Economics*, pp. 464-81.
- Maskus, K. 1990a. "Intellectual Property," in J. Schott, ed., *Completing the Uruguay Round: A Results-Oriented Approach to Completing the Uruguay Round Negotiations*. Washington: Institute for International Economics, pp. 164-79.
- _____. 1990b. "Normative Concerns in the International Protection of Intellectual Property Rights," *The World Economy*, pp. 387-409.
- _____, and D. Eby-Konan. Forthcoming. "Trade-Related Intellectual Property Rights: Issues and Exploratory Results." in R. Stern and A. Deardorff, eds., *Analytical and Negotiating Issues in the Uruguay Round*. Ann Arbor: University of Michigan Press.
- Nguyen, T., C. Perroni, and R. Wigle. 1991. "The Value of a Uruguay Round Success," *The World Economy*, pp. 1-14.
- Organization for Economic Cooperation and Development. 1991. *Science and Technology Industry Review*. Paris: OECD.
- Rapp, R., and R. Rozek. 1990. "Benefits and Costs of Intellectual Property Protection in Developing Countries," *Journal of World Trade*, pp. 75-102.
- United States International Trade Commission. 1988. *Foreign Protection of Intellectual Property Rights and the Effect on U.S. Industry and Trade*. Washington: GPO.
- World Intellectual Property Organization. 1988. *Background Reading Material on Intellectual Property*. Geneva: WIPO.

