
Intellectual Property Rights in the World Trade Organization: Progress and Prospects

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Introduction

Intellectual property rights (IPRs) have been the subject of significant international treaties for over a century. However, their addition to the fundamental framework of the World Trade Organization (WTO) via the Agreement on Trade-Related Intellectual Property Rights (TRIPs) is the most comprehensive expansion of their scope for three reasons. First, TRIPs not only incorporates fundamental concepts of IPRs protection from prior treaties, but also significantly expands the minimum standards required of its signatories. Second, current and prospective membership in the WTO is nearly universal, which means that more countries must introduce these standards to their regulatory frameworks. Third, because TRIPs avails itself of the WTO dispute settlement procedures, countries are, for the first time, subject to multilaterally approved trade sanctions if they fail to adequately implement and enforce the required standards for providing and enforcing patents, trademarks, trade secrets, and copyrights.

Despite the substantial changes accomplished by TRIPs, it remains a work in progress. Thus, the agreement allows for modification and reform; like other WTO agreements, TRIPs may be revised in future rounds of trade negotiations, which may give rise to questions regarding the

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interfaces between IPRs and competition policy, IPRs and environmental policy, and multilateral disciplines protecting the operation of copyrights governing electronic commerce.

Developing countries continue to implement the TRIPs agreement. Thus, it is premature to assess its economic effects. However, it is worthwhile to review the major concerns regarding the potential effects of the agreement and to analyze prospective policy responses to those concerns.

Operation and Implementation of the TRIPs Agreement

Although still a work in progress, the TRIPs agreement establishes an extensive set of minimum standards that would require significant legal and institutional change in many countries (see Primo Braga 1996 for details). A built-in agenda for reform exists within the parameters of the agreement itself. Moreover, as developing countries implement its provisions, the particular standards they adopt will affect the net international balance of benefits and costs emanating from stronger, global IPRs.

The Built-In Agenda

The TRIPs agreement calls for negotiations to raise protection for geographical indications, which are words identifying the region in which a good (such as wines, spirits, and foods) was produced. This issue has not received formal attention to date. The TRIPs council is required to review how the provisions are undertaken and to facilitate negotiation of a multilateral system of registration of wines to be protected by participating countries. According to the 1997 annual report (IP/C/12) of the TRIPs council, informal consultations are underway regarding the required review, while 11 member countries had submitted information on their registration systems.

TRIPs also mandates a review of Article 27.3.b, regarding exceptions to patentability in biotechnology and systems of protection for plant varieties by January 1999. This review had not been initiated by April 1998 and could be premature in light of ongoing implementation decisions. Steps had not been taken under Article 74.3, which requires the TRIPs council to study the scope and types of complaints to be allowed against indirect IPRs violations under the dispute settlement mechanism.

However, some IPRs disputes have emerged. For instance, in 1996 cases were filed regarding compliance with Article 70.2, which involved the length of patent term (resolved in October 1996) and rights in sound

recordings (resolved in January 1997 with the introduction of Japanese copyrights for recordings produced in the last 50 years). Two other cases involved the failure to implement “mailbox protection” for pharmaceuticals under Articles 70.8 and 70.9. One of these cases resulted in a WTO panel report that found India in violation of its obligations, as discussed further in the next section. In 1997, six other disputes emerged. Overall, this early record suggests that countries will use the dispute settlement mechanism to resolve differences in intellectual property rights.

Implementation Issues

Over the medium term the main issue on the TRIPs agenda may well be how key developing economies implement their WTO obligations regarding IPRs. How their laws and regulations will be structured is a problem of public choice, with preferences varying as much across various sectors and forms of protection as across countries. In principle, developing economies with lagging technological capabilities may be expected to establish norms that, while consistent with the TRIPs agreement, could place effective limitations on the strength of IPRs. Simply adopting highly protective US and European standards is unlikely to serve the needs of countries seeking modern technology (UNCTAD 1996; Reichman 1996). At the same time, the United States and the European Union will continue to exert external pressures on other countries to adopt strongly protective standards. These conflicting pressures make it difficult to be specific about implementation problems that might emerge.

Domestic political opposition to TRIPs is best illustrated by India’s failure to establish mailbox protection and marketing rights for drugs under foreign patents. Pharmaceutical products are not currently patentable in India—a policy that many believe is responsible for developing the domestic drugs industry. This industry is based overwhelmingly on imitative production of drugs under foreign patent and generic drugs, with Indian trademarks providing some measure of product differentiation. Unsurprisingly, there is little research and development (R&D) devoted to developing patentable products. Under these circumstances, the prospect of patents is viewed with concern both by Indian consumers and by producers who anticipate severe competitive difficulties. India’s failure to meet the requirements of TRIPs Article 70.8—including exclusive marketing rights for drugs patented elsewhere and priority rights for future patents—resulted in an adverse panel ruling in September 1997 (WT/DS50/R), which was upheld on appeal in December the same year (WT/DS50/AB/R). This case symbolizes the inherent difficulties that will face authorities introducing drug patents in the developing world.

Limitations on the Scope of IPRs

The TRIPs agreement sets minimum standards but leaves room for limiting the scope of available protection—provided the approach does not unduly frustrate its intentions. For example, members may select the highest reasonable standards for nonobviousness in patents, require adequate and timely disclosure of technological information, and limit protection to narrow patent claims. Evidence suggests that IPRs that encourage innovation by allowing inventors to improve patented material and to develop specialized applications are an important source of technical change and growth in competition among firms in countries pursuing modern technology (Scotchmer 1991; Maskus and McDaniel 1998).

Countries may set liberal exemption policies to exclusive rights in patents and software copyrights in order to promote reverse engineering (that is, the decomposition of technologies to learn how they work aimed at developing noninfringing inventions). The scope of patent protection required by TRIPs in computer software is unclear, reflecting the general confusion about the patentability of programs. Fair-use exemptions for patents in experimental research and copyrights for scientific research and education may also be liberally defined. Developing countries might be expected to pursue aggressive stances on decompilation of computer programs.

TRIPs allows use of nonexclusive compulsory licenses if adequate compensation is paid. The agreement requires that compulsory licenses expire if the conditions for their issuance disappear. International legal scholars are actively debating the breadth of allowable circumstances in which compulsory licenses may be issued (UNCTAD 1996; WHO 1998), especially in pharmaceuticals. The circumstances seem quite limited, though some countries are expected to test the limits. Particularly interesting is the case of dependent patents, in which governments may compel licensing of prior technologies in order to facilitate the use of secondary technologies that could lower costs of treatment or reduce industrial input costs. However, it is too soon to determine how significant this provision might be for issuing compulsory licenses.

Competition Policies

Competition policies aimed at disciplining abuses of IPRs are another way to limit the scope of rights (Reichman 1996). TRIPs allows measures to control competitive abuses of IPRs and presents a nonexhaustive list of three examples of potential abuse: exclusive grant-back conditions, conditions preventing challenges to validity, and coercive package licensing. Thus, while TRIPs envisions licensing abuses as sources of anticompetitive behavior, the definition is not limited in that regard.

Although numerous developing countries and countries in transition have recently adopted or strengthened competition policies, the area is open to considerable reform (OECD 1996). Implementing TRIPs provides an opportunity to assess the intimate linkages among IPRs, competition policy, and trade regulation.

It is possible that stronger IPRs could interact with inadequate competition rules to render markets less competitive. For example, consider the introduction of strong patent and trademark protection in nations where imports are regulated by mandated local-distributor laws. Because such property rights create protected market positions, it seems inadvisable to reinforce that market power by sustaining restrictions on entry at the distribution level. Thus, exclusive representation and licensing laws may need reform.

Further, countries must decide where they stand on exhaustion of IPRs. The exhaustion doctrine claims that once legitimate products are placed onto a market outside national boundaries with the rights-holder's authorization, his rights to prevent parallel imports disappear. Article Six of TRIPs states that, "nothing in this Agreement shall be used to address the issue of the exhaustion of intellectual property rights," which affirms the rights of countries to set national policy. The decision is not straightforward, however, since the expected gains from parallel imports depend on complicated market factors. There is a tradeoff between the possibly deleterious price impacts of market segmentation on the one hand, and the efficiency gains of vertical restraints and product monitoring on the other. One prominent group of international lawyers advocates permitting parallel imports, claiming that it is consistent with the TRIPs agreement in all functional areas (Abbott 1997). This is a potentially contentious issue for any new round of WTO negotiations on IPRs.

Alleged abuses of the rights inherent in a patent, trademark, or copy-right relate primarily to a business strategy, including selling practices and licensing restrictions, which extends the scope of property rights beyond that intended. There are few concrete guidelines in the area because of the complicated and imperfect nature of the markets for information and technology. For example, vertical licensing agreements may ensure downstream product quality by local vendors, which aids competition. However, tie-in sales of unrelated products to technology buyers could represent an attempt to extend the scope of the initial property right and be harmful to competition.

Competition authorities have found it difficult to set rules for licensing agreements. Competition policy must attempt to assess the potential anti-competitive impact of such arrangements if they are to be regulated, modified, or banned. The impact depends critically on the structure of the markets in which agreements operate, the share of markets covered, and the difficulty of entry that licensors and licensees encounter. In those developing economies in which entry is made difficult by monopoly

distribution laws, the absence of parallel imports, general trade and investment protection, and inadequate financial markets, it is important to consider the wider relation of business regulation to the development of stronger IPRs.

Thus, there are complex relationships between IPRs and their potential abuse, which is not an easily defined term. Property rights support market power, the exercise of which does not automatically constitute an abuse of position. Competition authorities must be capable of distinguishing various forms of behavior in terms of their potential impact on static and dynamic competition. In this view, it is probably advisable for countries developing competition rules to adopt the US “rule of reason” approach of considering the merits of individual cases, rather than attempting to codify rules covering specific actions, which is the EU approach.

Social Regulation of IPRs

The scope of IPRs may also be limited for social regulation. For example, TRIPs does not restrict pricing regulations in drugs for supporting public-health initiatives. Government health ministries also may exert countervailing monopsonistic power in purchasing patented drugs for their public-health programs—a factor that mitigates price increases from patent protection. Countries might choose to discipline potential price abuses in pharmaceuticals by allowing parallel imports, an issue under active discussion. However, recommending parallel drug imports requires careful consideration. It is possible that integrated markets could increase drug prices in poor economies, while the threat of parallel imports could induce firms to refrain from supplying patented drugs to particular markets. Thus, governments that take recourse to such controls must weigh their benefits against the costs of deterring technology transfer and local production, and innovation.

This approach is illustrated clearly by South African legislation passed in November 1997 that aims to offset the anticipated impact of patents on drug prices (USTR 1998).¹ The law permits the minister of health to overturn the patent rights of pharmaceutical firms if it is deemed necessary to reduce the costs of medicine in South Africa; allows parallel imports of medicines; and mandates that pharmacists substitute generic drugs of the same quality for prescribed drugs under patent—unless patients or physicians forbid it. The law is perhaps the best early example of the cross-currents in TRIPs rules. By invoking the broad authority allowed to set ancillary competition and pricing rules in patented products, it does not necessarily violate the letter of the agreement—though this remains subject to clarification. However, by effectively denying the

1. As of July 1998, the law is not in effect because it is subject to litigation brought by some multinational pharmaceutical firms operating in South Africa.

pricing power implicit in the exploitation of patents, it possibly violates the intentions of the TRIPs accord.

Concerns also arise regarding the scope of protection and safeguards in patenting biotechnological inventions. Many scholars advise adopting a broad proscription against patenting biotechnological products and processes, based on the doctrine that such inventions are really “discoveries of nature” or do not involve truly inventive steps, and thus are not patentable in the traditional sense. Such an approach would run directly counter to recent practice in the United States, in which judicial interpretation has favored awarding patents both to broad classes of genetic material based on a particular invention and to genetic tools. This interpretive gulf promises to stimulate intensive negotiations when the TRIPs language on biotechnology comes up for review in 1999.

Economic Issues Facing the WTO in IPRs

As this discussion suggests, controversies regarding implementation and interpretation of TRIPs obligations should dominate the attention of those interested in IPRs in the WTO. However, this circumstance should not obscure the more fundamental questions at work. First, what may be said about the potential economic effects of this stronger set of global standards? Second, in light of the competitive realities presented by TRIPs, how might developing countries fit their new requirements into a broader framework of regulation?

One primary objective of TRIPs is to reduce copying and other forms of unauthorized imitation, along with their attendant sales and trade, in those developing countries with significant imitative capabilities. Few observers seriously dispute the obligation to combat literal imitation of copyrighted goods and misappropriation of trademarks. However, controversy persists over the competitive and social implications of awarding patents in pharmaceuticals, agricultural chemicals, and biotechnology in addition to protecting plant varieties. Similar concerns arise over the potential for copyrights to raise access costs to research materials and technical information.

The developing economies’ eventual full adherence to TRIPs should have significant impacts on international economic activity. To date, empirical evidence tends to be inconclusive, partly because the channels of influence are often subtle, indirect, and immeasurable. However, a brief review of available information should help guide policy discussion.

Price Impacts

There is concern that product patents in pharmaceuticals, agricultural chemicals, and biotechnological inventions in addition to protection of

plant varieties could confer considerably greater market power on rights holders and support monopolistic prices in key medical treatments and industrial inputs. This basic perception has some grounding in fact but such fears are often exaggerated. The extent to which prices will rise in response to stronger market power depends on many influences, which vary across countries.

No aspect of TRIPs is more controversial than the introduction of patents for medicines. Little is known about the potential impact of this policy change. However, the preponderance of (tentative) conclusions from the few studies available is pessimistic about its net effects on developing countries' economic welfare.

The most comprehensive study of pharmaceutical markets is by Lanjouw (1997) for India. Her research indicates that India has a highly competitive drug industry, based on effective imitation, adaptation, and brand names. In India, brand advantages are important but seem to capture only about a 10 percent price premium over uncontrolled products. In such an environment, introducing pharmaceutical product patents could raise prices considerably. Accounting for only static price impacts under elasticities assumed to vary by therapeutic class, Watal (1996) computes that patents could result in an average 50 percent increase in the price of drugs (from a 1994 base).

The Indian government could attempt to control the price of patented drugs through administrative price ceilings. In doing so, however, three interesting complications arise. First, companies that are awarded patents may choose not to supply the Indian market at the regulated prices. Second, price regulations are often stated on a "cost-plus" formula, which encourages firms to set high transfer prices on imported ingredients. Third, the price ceilings in certain developed countries are increasingly tied to reference price indexes in other markets (Danzon 1997). Accordingly, firms have an incentive to bargain for the highest possible prices in the low-income economies (such as India) in order to gain a higher set of global reference prices. This issue promises to be controversial in low-cost countries as patents are adopted.

Offsetting these costs is the possibility of some dynamic benefits. It is possible that a higher proportion of new drugs will be available to countries as they protect patents. Moreover, it is likely that additional global research will be devoted to the diseases of poor nations, which currently attract a small portion of global R&D funds. It is then possible that some of this additional R&D would take place in research facilities of multinational enterprises (MNEs) in developing economies. Market development activities particularly might be enhanced by introducing enforceable trademarks.

In agriculture, countries must provide either patents for new plant varieties and seed strains or effective *sui generis* for inventors. Since most developing countries do not extend any protection to plant varieties,

there is concern that farmers in poor countries might not be able to afford such key agricultural inputs priced under patent protection. It is also argued that extensive recognition of breeders' rights could eventually reduce genetic diversity. Questions are also raised about the impact of stronger protection on the ability of public research laboratories to develop and disseminate protectable materials. However, a recent study of new systems introduced in Argentina, Chile, and Uruguay reaches mainly positive conclusions about technology transfer, and local innovation and adaptation, with limited impact on seed prices (Jaffe and van Wijk 1995).

Impacts on Trade, Investment, and Technology Transfer

The TRIPs agreement could have strong impact on international trade and investment, though again the evidence is not entirely clear. Regarding trade in goods, Maskus and Penubarti (1995) found that a stronger patent law would significantly raise a country's manufacturing imports. This effect was strongest in large developing countries with substantial imitative ability, but was weaker in small developing countries.

There is also growing empirical consensus that strengthening IPRs bears promise for attracting additional foreign direct investment (FDI). In recent econometric work, Lee and Mansfield (1996) found that the perceived weaknesses of IPRs in countries that were potential recipients of US FDI had a significantly negative impact on investment volumes. Further, both the volumes and technology levels of investment were diminished in nations with weak IPRs. Maskus (1998) provides further evidence of a positive link between patent strength and investment volumes.

Finally, it is evident that technology and product licensing should be particularly responsive to IPRs, which reduce the costs of licensing, expand security over protection of proprietary information, and allow better licensee monitoring. This view is consistent with survey evidence (Mansfield 1994) and is supported by emerging econometric work (Yang 1998).

Innovation and Technology Diffusion

Information and technology developers have achieved considerable strategic advantages from TRIPs. However, the agreement's ultimate gains must come from the stimulus it provides to further innovate and diffuse technical information. TRIPs should promote technology development in sectors where patents and trade secrets are necessary for protecting inventions from imitation by free riders—such as pharmaceuticals, chemicals, biotechnology, and scientific instruments. Moreover, in the right circumstances, many firms currently engaging in imitative R&D could find it profitable to shift into small-scale innovation for local markets.

There is potential for increased innovation in developing countries as IPRs are strengthened. For example, in developing countries with a reasonable skill basis and opportunities for entrepreneurship, stronger trademark and copyright protection tends to encourage rapid development of new goods by local firms.

Many observers in developing countries are concerned about the impact of TRIPs on diffusion of technical information as access to technologies becomes more costly. This pessimistic view does not account for the spillover gains in local productivity that may occur through patents. Patent applications require that technical information be disclosed, which spurs incremental invention. Gains in productivity also occur through imports of capital goods and technical inputs embodying advanced technology that improve production processes. Similar effects occur with FDI. Results noted above suggest that stronger IPRs could increase the volume of these activities.

A Cautionary Note

This overview supports an optimistic view of the long-term international benefits of TRIPs, though the balance of gains and losses will vary across countries. But note that if trade, FDI, and technology development and transfer respond positively to TRIPs, there will be a global scale effect in which all countries that establish stronger standards share in these increases. However, if such flows depend instead on international variations in IPRs, the convergence of policies would diminish the importance of national IPRs regimes. Thus, some countries that currently have relatively strong systems could suffer from a substitution effect toward reforming economies, while others could be frustrated by the inability of stronger standards to attract more business.

Extending TRIPs

Perhaps the most interesting, if most speculative, question is whether protecting intellectual property rights through TRIPs will prompt its extension to additional areas.

Competition Regimes

Emphasizing competition rules to discipline abuses of IPRs could encourage countries to pursue policies that are inimical to the interests of information and technology developers. Such rules may be challenged, though probably unsuccessfully, based on indirect nullification and impairment of intended benefits under the agreement to the extent they

restrict the ability of rights holders to exploit their protection. In turn, this would raise pressures to incorporate competition policies into any new round of trade negotiations, with a view toward establishing limits on the intervention powers of competition authorities (or expectations that they would intervene in domestic exclusionary practices).

However, interests in competition policies affecting IPRs vary greatly among countries; differences even among developed nations is remarkably wide. Harmonizing these policies in a global antitrust code appears unlikely (Fox 1996).

Electronic Commerce

The TRIPs agreement might also be revised to incorporate the emerging copyright rules that govern electronic commerce over the internet (WTO 1998). Vigorous international growth in electronic transactions requires enforcing copyright laws and protecting trademarks and electronic domain names.²

Standard copyright principles apply to electronic transmissions under the TRIPs agreement. Thus, duplication and distribution rights extend to computer programs and electronic databases. However, enforcing these rights is extremely difficult in digital products, and TRIPs is silent on how to technically deter unauthorized downloading and distribution.

Thus, the Copyright Treaty and the Performances and Phonograms Treaty (agreed on under the auspices of the World Intellectual Property Organization in December 1996) call for measures to protect against circumventing technical measures that limit access or control copying of digital works. They also facilitate licensing and collective management of copyrighted materials on the internet by permitting identifying markers on materials and making unauthorized removal of those marks illegal. The treaties further clarify the rights of performers, authors, and music producers to authorize communications of their works in an environment of on-demand delivery.

These new treaties push the frontiers of copyright protection, which is advisable in light of technical changes in copying ushered in by digital transmissions. It is sensible for these agreements to be covered by the TRIPs agreement in the next round of negotiations. However, some observers argue that strict anticircumvention rules and extension of copyrights to databases unreasonably penalize those who need access to information for scientific and educational purposes. Thus, one interesting question will be how countries choose to define fair-use exceptions for internet materials.

2. Note that the expanded use of electronic information networks is important to developing countries in administering their own IPRs regimes and in promoting technology diffusion through access to international patent and trademark databases.

A related issue pertains to trademark protection on the internet. Trademarks are recognized on a territorial basis and support licensing restrictions on distribution, including restrictions against parallel imports. However, internet commerce is inherently operated without borders. Merchandise that is transacted over the internet must be shipped, so that regulatory restraints (taxes and import restrictions) may be feasible. Nonetheless, it must be recognized that imposing tariffs on products and services traded electronically would slow development of cross-border internet commerce. In this context, multilateral adoption of the US proposal to ensure free trade in electronic commerce is desirable.

However, downloadable materials and services are less controllable. The challenge will be to produce mechanisms for identifying the true origin of products, enforcing permissible territorial restraints (a problem to which there may be private solutions), and defining the exhaustion of rights. These issues are significant for the evolution of TRIPs.

Environmental Protection

It is not clear how TRIPs might affect international environmental use. Stronger patents and trade secrets could enhance the development and transfer of cleaner technologies and products. However, if diffusion and absorption of new technologies become more costly, local firms may be slower to abandon polluting technologies.

The main problems lie in the drug industry and biotechnology. As discussed earlier, TRIPs extends protection to pharmaceuticals, chemicals, biotechnological products, and plant varieties, but nothing is stated about rights in underlying biological and genetic materials that serve as inputs to these sectors. Thus, there are concerns that TRIPs will raise incentives to extract such materials and develop patentable products from them without providing mechanisms for sharing the gains with governments or local landowners. TRIPs is also criticized for not explicitly safeguarding biological diversity in protecting drugs and biological technologies. Thus, there are proposals for revising the agreement with more explicit references to environmental protection.

At the simplest level of economics and law, it is difficult to see the logic of the concerns about rent sharing. Nothing in the TRIPs agreement prevents the development of contracting requirements or royalty charges that would effect a transfer of rents on biological materials. Doing so is a matter of developing institutions and human capital. If such institutions effectively represent national or local interests (and markets function well), returns to each activity should adequately reflect scarcity and investment costs.

However, markets for genetic resources are likely imperfect or incomplete, reflecting the public-goods nature (“nonrivalness”) of genetic information, information asymmetries between resource developers and

owners, and imperfect competition among firms—along with uncertainty about the potential returns from exploiting such resources. Further, there may be legitimate issues of international coordination in biodiversity, because private development of new medicine and genetic technologies does not account for spillover costs either to other countries or to later generations from resource depletion.

Such depletion is not inevitable. Appropriate incentives could improve and rationalize conservation efforts, with a beneficial impact on both diversity and product development. Since property rights tend to enhance such incentives, TRIPs could play a positive role. However, to the extent that spillover effects are not adequately priced in the market, TRIPs could result in an excessive rate of resource extraction. Indeed, to a considerable extent TRIPs represents a piecemeal extension of property rights, which may or may not improve incentives for optimal conservation.

These problems are vaguely addressed by the TRIPs agreement, which remains unsettled on the multilateral scope of IPRs in biotechnology; it simply acknowledges the possible need for social regulation of intellectual property use. Thus, attempts to strengthen the agreement's language regarding plant varieties and biotechnology patents could be accompanied by explicit provisions regarding rights in, and management of, genetic resources. Further, the relationship between the Convention on Biological Diversity and TRIPs should be clarified and the possible expansion of the IPRs disciplines and constraints to such problems should be considered in the next round of trade negotiations (Strauss 1993).

Conclusions and Recommendations

Because of the complexities in the economics of intellectual property rights, there are no simple rules for optimal regulation. Regulations exist to correct market failures and, at the international level, to overcome cross-border externalities and to prevent governments from taking actions that harm both their own countries and foreign trade partners.

TRIPs will ultimately remove governments' ability to use weak IPRs as a means of promoting imitation, forcing technology transfer, and disciplining abusive market power. Whether prior systems of weak standards have achieved such goals or simply have excluded developing countries from sharing in the fruits of new technologies is difficult to know. The absence of effective IPRs in many developing nations may constitute a low-level, noncooperative equilibrium from which they will move forward by adhering to TRIPs. Countries have already adopted stronger standards because of globalization pressures, but TRIPs could help deter additional regulatory competition.

Only time will determine how effective the TRIPs agreement has been as a program of international regulation. It disciplines governments that

encourage infringing IPRs and shifts incentives toward some forms of local innovation. Both of these effects could result in a wider balance of benefits. The agreement also moves uncompensated information spillovers more firmly into protected avenues, which may induce higher prices but raise the quality of incoming products and technologies. Whether TRIPs becomes an effective global policy depends on whether the world had been investing inadequately in new technologies (as a result of weak protection), how strongly it moves innovation toward the frontier, and the distribution of gains and losses across countries.

As mentioned earlier, TRIPs remains a work in progress. Its implementation is ongoing and certain standards are subject to considerable debate. Countries need to strike an appropriate balance between stronger IPRs and public-interest limitations on their scope. Political-economic interests in each country will make achieving such balance difficult, while the standards that emerge may prove frustratingly weak for firms hoping to exploit their intellectual property on a wider scale.

Thus, an important medium-term task for policymakers in technology-exporting countries is to monitor national implementation strategies in order to assess both their consistency with TRIPs and their coherence as development tools in an increasingly integrated world economy. It is also important to provide competent technical assistance for setting standards and establishing adequate administrative and enforcement mechanisms.

The TRIPs agreement requires review of some of its most critical provisions, including protection for biotechnological products and plant breeders' rights, and the operation of dispute resolution. Revising requirements in biotechnology promises to be controversial if the attempt centers on imposing strong and broad patent protection (i.e., as the United States did) on a global scale. In this context, it is important to assess the complex interrelationships among biotechnological invention, IPRs, and ownership of genetic resources. Presently, it seems unlikely that strengthening protection within the confines of TRIPs alone is feasible, because it may not provide sufficient opportunity for trading stronger patents for reciprocal gains in genetic rights or in broader areas of market access. Thus, the issue may need to await the next round of trade negotiations.

Despite the interests of American IPRs holders in establishing more universal international proscriptions against parallel imports, the issue is so contentious that it is unlikely to be raised during the TRIPs review. At present, many countries are considering the role of the exhaustion principle in setting competition rules governing the exploitation of IPRs. Those who seek a global agreement to restrict parallel imports must, at a minimum, make a stronger case for the efficiency and quality gains that could emerge from enhancing market segmentation (Ullrich 1995; Chard and Mellor 1989). However, such gains would be unevenly distributed across countries, and countries with thin markets and monopolistic distri-

bution systems could be net losers. Thus, a method of granting compensation to importing nations that agree to restrict parallel imports may be needed to move forward.

In this context, an agreement on parallel imports will most likely await a new round of trade negotiations in which the complex issues of trade-related competition policies would dominate. As in other areas of competition policy, the treatment of IPRs is highly complex and dependent on circumstances, making the negotiation of uniform international anti-trust codes unfeasible; instead, it would be advisable for most countries to adopt a “rule-of-reason” approach in their evolving competition systems in intellectual property. For their part, multilateral negotiations should assure market contestability, keeping in mind that IPRs, perhaps uniquely among business regulations, can both support and limit competition.

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