There is a need for strong intellectual property rights in less developed countries, particularly for production-related innovations. Intellectual property protection can solve market failure problems and, through a policy "credibility" effect, encourage innovations and international technology diffusion. The article outlines the need for such protection and critiques some of the arguments for making an exception to strong protection in less developed countries.

Intellectual Property Rights in a North-South Economic Context

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Should all nations provide strong intellectual property rights (IPR) protection or should exceptions be made for less developed countries? This article addresses some of the economic arguments made in favor of strong IPR protection in developed and less developed countries alike. Numerous studies have discussed the desired strength within the context of a single economy; few have discussed it within the context of a North-South interdependent world.

For the purposes of this article, the terms North shall refer generally to innovating countries and South to technology importing and/or imitating countries, a simplification we employ to shed light on the conflicting and cooperative interests in determining the desired strength of IPR protection. Clearly, not all innovating countries are geographically located in the Northern Hemisphere nor are all imitating countries in the South. Moreover, both imitation and innovation activities occur in the North as well as in the South. Nonetheless, some general factors may be said to characterize the two areas.

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As a region, the Northern countries tend to be wealthier and to generate most of the world's innovations. The countries of the Southern Hemisphere tend to be poorer and to innovate very little, relying instead on innovations from the North. Furthermore, much of the focus on international violations of IPR has centered on the imitation activities of the South.

A number of commentators have suggested that, because of this disparity, the South constitutes a special case and that this region warrants an exception to the rule that IPR be respected (Dearhoff 1992). They sometimes argue that because the Southern economies are poorer and cannot afford to pay for the IPR-protected innovations, requiring Southern economies to adhere to IPR would mean denying them innovations crucial to their social welfare, especially (but not only) those innovations relating to health, environment, education, defense, or the pursuit of further knowledge. Some commentators have even brought into the debate matters of ethics, claiming that it is unethical for the North to impede technology diffusion to the South. This article argues that such objectives as giving the South access to socially desired innovations are best achieved in a regime which respects IPR, however.

To formulate this point, we first identify research as an investment activity. This activity cannot be undertaken efficiently in the private marketplace without IPR protection because of the nature of research, namely, the low, or even zero, costs of replication. Second, because of this fact and because IPR protection is at the discretion of the public authorities, it is tempting for the latter to renge on IPR promises and to permit imitators to diffuse innovations more cheaply. Anticipating this, researchers invest inefficiently. Thus public authorities in the North and South can best stimulate a steady stream of new innovations and technology transfers by maintaining a strong, credible IPR system. Third, lagging economic development is a consequence of an underdeveloped innovation sector, which, in turn, is a consequence of weak IPR. Before proceeding, it is important to clarify that our focus is IPR protection for production-related technologies. The focus of this article is not on copyright protection for nonproduction-related output, such as fine art, music, films, and literature.

**Economics of Innovation 101**

Research and development (R&D) is an investment activity much like physical capital investment. Both lead to the creation of important inputs into production, such as equipment, machinery, and technology, as well as to new methods of production. Both the private and public sectors engage in the R&D and physical capital investments. Normally, but not always, governments take care of R&D and infrastructural investments that the private market has inefficient incentives to undertake. For example, it is most common for the public sector to engage in space, defense, and environmental research and to finance and/or build bridges, dams, and airports.

However, some crucial differences between R&D and physical capital investment exist which, in the absence of social intervention, lead to market failure in the market for innovations. First, the products of R&D, namely innovations, are relatively less costly (if not costless) to imitate. As a result, innovators would not be able to appropriate fully, if at all, the rewards of their investments, as imitators would force market prices below that which is necessary for innovators to recoup their development costs. Second, there are externalities associated with R&D activities, meaning that there are positive benefits accruing to members of society outside (or external to) the innovating agent. For example, the knowledge discovered adds to society's stock of knowledge and thereby benefits future innovators. The innovator, however, typically considers just the costs and benefits of its R&D investment to itself and not to society as a whole. Hence private interests diverge from social interests. Furthermore, unlike the stock of physical capital, the stock of knowledge is like a public good—that is, a good that is nonrival in use.

Given these circumstances, there is a “missing markets” problem. The private market fails to provide an adequate supply of innovations, if any. One solution to this problem is for the government to fund or perform R&D. Another is to create a market where none existed. This is the strategy behind intellectual property rights protection. It defines ownership claims to the stock of knowledge and creates a market for them via a system of patenting, licensing, and royalties. The outcome is much like a stock market, whereby, essentially, ownership shares to the stock of physical capital can be traded. Because it is impossible to break up factories and divide the pieces among the owners without destroying the function of factories, it is more efficient to trade paper asset claims to the factories.

Economic analyses also reveal that an important determinant of innovation is the credibility of IPR policy. A credibility problem arises whenever public policies display the possibility of “time-inconsistency”—that is, the potential for policy authorities to renge on earlier promises. Time-inconsistency problems arise whenever the current decisions of economic agents depend upon expected future policy. Conditional on these expectations, agents make decisions. When the future arrives, agents have already made their decisions. The government can therefore alter policies without affecting those decisions. Of course, for purposes of future decisionmaking, agents respond by altering their expectations about the course of policy but
cannot undo their earlier decisions. One example of time-inconsistency is the announcement of tax forgiveness to tax evaders. If they come forth and pay up back taxes, the government will not fine them. This is good for the government because it can collect revenue. However, once evaders identify themselves, the government can raise even more revenue by fining them and punishing them as an example to future evaders. Thus it is optimal for the government to break its promise of forgiveness. Of course, in the future, such announcements will no longer be credible and evaders will never come forth.

A second example of time-inconsistency concerns debt repayment. To attract loans, a borrowing country promises repayment, but once the loan is made, it has an incentive to repudiate it. Of course, this action affects its future ability to borrow, but if it deems that it has no further need to borrow, then this is a good one-shot policy. In these examples, the government has an ex post incentive to alter policy given that the decisions of agents are sunk. But ex ante, the policy is not credible if such an ex post incentive exists.

IPR policy has a similar potential to be time-inconsistent. Ex ante it is optimal for the government to promise protection. This choice stimulates R&D, followed by a successful innovation. But ex post, after the innovation is created, it is no longer optimal to give protection because by permitting imitation, the authorities can ensure that knowledge is diffused and prices lowered. Hence the IPR policy loses both its credibility and its force when it is expected not to be consistently carried out. By maintaining the IPR policy in the face of temptation to renege, however, governments develop a reputation for honoring IPR and thereby encourage a steady stream of innovations. While in the short run it is optimal for a government to change policy in a discretionary manner, in the long run it is optimal to deliver on promises. By sticking to its policy, a government acquires credibility. Once a government loses credibility, it is expensive to restore. The government is likely to need to maintain the same policy for a long time before the desired rate of innovations is induced.

The same time-inconsistency problem also affects North-South relations. To attract foreign technology, a Southern Hemisphere government may promise to provide IPR protection to the Northern firm. But once the technology is transferred, the Southern government has an incentive to allow it to be imitated. Knowing this, a Northern firm may choose either not to transfer the technology or else to transfer it in a very limited way. In the long run, an optimal strategy for a government is thus to maintain a strong and reputable IPR system and thereby encourage a steady stream of foreign technology transfers. If a country loses its credibility with foreign investors but tries to reestablish its reputation for honoring IPR, there will be a period of time during which little innovation is transferred to that country even if

strong levels of IPR are provided there. Thus, once credibility is established, it pays a country to honor IPR strictly, for any deviation will be costly in terms of the time it will take to reestablish inflows of foreign technology.

Lax IPR protection in the South also tends to have effects spilling over into the North. To the extent that the rewards to innovation are less if the Southern market is not IPR protected, Northern firms would engage in less R&D, which could hurt the South if innovations beneficial to it are discouraged. The rewards to innovation would be lowered even further if a Northern (or Southern) imitator located in the South reexported the innovation (or products and services based on it) to the North and thereby undermined the ability of Northern innovators to appropriate the benefits of their investment. Weak IPR in the South also force Northern consumers to pay higher prices for an innovation, as Northern firms raise prices in existing IPR-protected markets to recoup their development costs.

IPR and Less Developed Countries

The above framework can now be used to respond to arguments that there exist some exceptions to strong IPR. First, consider the following statement made in 1986 by a South Korean official who was explaining Korea's past imitative activities:

Historically, Koreans have not viewed intellectual discoveries or scientific inventions as the private property of their discoverers or inventors. New ideas or technologies were "public goods" for everybody to share freely. Cultural esteem rather than material gain was the incentive for creativity. (Steidlmeyer 1993, 160-161)

Consider also an official 1989 view of the government of India that member states ought to be free to "attune their intellectual property protection system to their own needs and conditions" (Steidlmeyer 1993, 160-161). From this perspective, IPR laws in the South should be compatible with its development priorities. The right to development (in the South) should prevail over the intellectual property rights of the North. These statements contain a number of myths, myths insofar as they have no bearing on the need for strong IPR globally.

Myth #1: New Ideas or Technologies are Public Goods

Research consists of three kinds: basic, applied, and developmental. Basic knowledge is considered a public good. It is difficult to appropriate and patent protection is rarely given to basic findings. This is not a new insight nor even
much of an old insight. Moreover, as pointed out earlier, if research entails benefits to society which so far exceed private returns that the private market does not undertake it at a desirable scale, the public sector engages in it. However, applied and developmental research produces new innovations, which are not by nature public goods but are marketable. They can, of course, be converted into state goods by decree. The government would have to subsidize their production to ensure a steady supply, because according to the previous section, if the government were to nationalize innovations, thereby effectively canceling private IPR claims to them, the future flow of innovations would decline. Whether to nationalize them at all is really the sovereign government’s prerogative and depends on what its objectives are (research efficiency not being one of them). Likewise, the government can choose to nationalize a piece of physical capital stock even if it is not, like highways or airports, a public good by nature.

Myth #2: Different Cultures Have Different Motivations for Creativity (Including Nonmaterial Rewards)

This statement conflicts with the idea that researchers will innovate only if they expect to earn a decent reward (at least enough to recoup development costs). The official believes that in his culture, the innovator will innovate even if development costs cannot be recouped because the “cultural esteem” is incentive enough. This assumption is not being challenged. However, it does impose views on others, particularly on the innovating North, who respond to different incentives (namely, material ones). Northern innovators should not be expected to respond to the same cultural calling and to continue to supply innovations to the South.

It is a tautology to say that in cultures which do not have an IPR system, the driving motivation for innovative activity must not be one dependent on recovering development costs. This has to be true if innovation occurs despite the irrecoverability of development costs. Without more extensive quantitative and qualitative data on the innovation in the South, it is difficult to verify what, in these cultures, drove innovative activity: the culture or material incentives? Indeed, observations show that in cultures without an IPR system there is little R&D innovative activity. The bulk of the world’s R&D and related innovative activities are conducted in the North. One explanation is that the South lacks the research infrastructure and human capital to conduct research (which makes most of the claim that cultural pride drives innovative activity because under those circumstances, no observable innovative activities are going on). Another explanation is that the South does not provide incentives to make innovative activity worthwhile. These two expla-

nations are not unrelated. An IPR system will provide such incentives and attract resources to the South. Once a research sector is developed, there will be an ongoing interest in preserving it and the IPR system (Park and Ginarte 1995). No longer will it be the case that the IPR system serves the interests of foreigners only. Indeed, a “vicious circle” exists: There is no interest in defending IPR because no innovation goes on; no innovation goes on because there is no defense of IPR. This vicious circle may, in fact, be a better explanation of low IPR levels and innovative activity in the South than some underlying cultural factors.

Myth #3: The Right to Development Takes Precedence over the Intellectual Property Rights of Innovators

Economic development is a complicated process for which not even Northern economies quite have the formula. To express it as some kind of right misses the point that economic development is earned, not given, transferred, or transplanted in any way. Economic development is the outcome of good investments in various options (such as human capital, physical capital, and technology) and of supportive institutions (legal, market, and political). Empirical studies have especially stressed investments such as R&D and institutions promoting IPR and trade (Mansfield 1994; Park 1995). IPR are thus prerequisites to stimulating technological change in the South. Weak IPR also limit the extent of technology transfer into the South. The fewer the innovations introduced, the wider the gap between the South and the North, and the more sympathetic the argument becomes that the South should be able to get technologies for free to allow them to catch up.

Nonetheless, the South is currently lagging technologically and has little incentive, according to the vicious circle argument, to give IPR protection because it lacks a mature innovation sector. Allowing imitation, however, is not the solution to breaking out of this trap. The more appropriate policy is to combine a strong IPR system with R&D taxes-cum-subsidies or development assistance. Imitation activities might temporarily make new innovations available more widely, but they gratuitously distort incentives to do future research and limit the diffusion of future new technologies. This is the message of the time-inconsistency analysis.

Conclusions

Protecting IPR is clearly in the interests of the less developed countries, in the sense that this is the optimal route to acquiring technology and
achieving economic development. One of the ironies in current world trade talks is that while countries have been working to dismantle restrictions to international trade such as tariffs, they have, at the same time, been working to erect higher IPR levels, which appear to restrict international technology flows. The irony is understood by recognizing that trade barriers distort the market mechanism while in the absence of IPR, there is market failure in the market for innovations. Indeed, we have argued that R&D activity is an example of market failure (in which private interests differ from social), whereby social intervention in the form of IPR allows the market for innovations to exist. The market for innovation is also one that faces a constant threat of inconsistent public policies. Hence a stable, credible IPR policy is necessary for the functioning of this market.

Is it unethical for the North not to assist the South at a time when they are lagging the North in technological development? Yes. But if so, then it must also be unethical to let inflation rates be high in the South. Moreover, such arguments are rather beside the point. Whether governments are combating slow productivity growth or high inflation, smart choices have to be made and smart policies (that is to say, ones that work) have to be implemented. Just as inflation in the South is often the result of mismanaged monetary or fiscal policies, lagging technology is often the result of bad technology policy.

Notes

3. Examples are intermediate goods, such as capital equipment, final products, or new methods of production.
4. It is also common property to the extent that knowledge is available for all, but the term is inexact. Rivalrous goods (such as a pecan pie) can be common if no property rights are assigned. The tragedy will be that the pie will be eaten too quickly by too few.
5. Another example of missing markets is the case of negative externalities from pollution. Tradable pollution permits help solve the missing markets problem by creating a market where none existed.

References