Part V

Conclusion

17

The Role of Intellectual Property Rights in Developing Countries: Some Conclusions

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It is not a surprise that, as the global economy has increasingly become based on knowledge and innovation, the question of intellectual property rights has become central in the global economics debate.

It is usually suggested that because the advanced industrial countries have a comparative advantage in innovation and knowledge production (a by-product of their relatively more effective and advanced "national systems of innovation"), a tough IPR regime is in their interests. It would also ensure a flow of funds—mostly in the form of patent and copyright royalties—from the developing to developed countries, to replace the lost revenue from previous exports of traditional manufacturing products that are now mostly imported from developing countries.

But such an interpretation is incomplete, if not wrong, for several reasons. First, a "tough" IPR regime may not even be in the interests of the advanced countries; as explained in Chapter 1, all innovations build on previous innovations, and by making the fruits of existing innovations less accessible, the progress of science and technology may be inhibited. Indeed, with modern innovations requiring a myriad of ideas and access to a myriad of patents, holdups and patent thickets have become a significant problem, and the patent system is increasingly seen as an impediment to scientific progress.

Second, even the advanced industrial countries have an interest in the rapid growth of *all* other countries: growth in emerging markets and developing countries can be complementary to that of the advanced countries. Indeed, in recent years, emerging markets and developing countries have been the engine of global economic growth. A *better* IPR regime—which fosters more innovation and more access to knowledge—would facilitate growth in developing

countries, reducing the knowledge gap, which remains a critical distinction between developed and developing countries.

Third, everyone has an interest in the promotion of global public goods—in doing something, for instance, about global warming. For example, concerns about having to pay large rents to developed countries that control access to emission-reducing technologies is one important impediment to reaching a global climate accord. At the same time, without some incentives to undertake risky innovation, there may be fewer emission-reducing technologies available.[1]

Finally, we have a humanitarian interest in avoiding unnecessary suffering (either for lack of food or healthcare or the like. This means at the very least there should be access to life-saving medicines and better seeds and agricultural technologies. The IPR system has to be designed to facilitate both innovation and access, without imposing unnecessary impediments, as the current system does.

It is not just a matter of "strong" vs. "weak" rights, but the appropriate design of the IPR regime. The current IPR regime may serve a few industries well (such as pharmaceuticals), but the extent to which it serves the interests of other industries or society as a whole is open to question. The authors of the papers in this volume differ in how each might design the "optimal" IPR regime—some putting more emphasis on the role of IPRs in providing incentives, others on the role of IPRs in inhibiting the free flow of knowledge. Several papers argue for a much more circumscribed IPR regime—indeed, some contributions to this book seem to ask whether we need IPRs at all—while others do not object too much to a "tough" regime although most would agree that there is considerable room for improvement in dominant IPR regimes.[2] Those who are most critical of IPRs find it hard to see any compelling evidence that IPRs have been a key driver of the capitalist search for innovation. Rather, they see *IPRs as an obstacle to further innovation*, as Boldrin and Levine (2008b) suggest was the case with Watt's stream engine patents. There is indeed a long list of cases in which similar obstacles have been reported, from patents on automobiles to those on the OncoMouse (see Chapters 1 and 2). These scholars believe that even without IPRs, there is sufficient ability for innovators to appropriate returns on investment—for example through secrecy, first mover advantages, and *tacit knowledge*—for innovation to be adequately incentivized. On that premise, IPRs might become an *obstacle to innovation even in "frontier" countries*, or at the very least give rise to unnecessary patent rents. As is often the case, rent-seeking can have adverse effects on both economic efficiency and distribution.[3]

Even if some IPRs remain desirable in some form, the current system is not designed to maximize welfare-enhancing innovations, even in developed countries. It may, for instance, result in *excessive "protection" of intellectual property*, as a result, for instance, of the enclosure of the knowledge commons. This critique applies to patents and, even more so, to copyrights and certain

other forms of IPR protection: the notion that a copyright royalty paid on, say, a book up to 70 years after the death of the author would be an incentive to the creativity of its writer is quite debatable, particularly where such term extensions are granted retroactively.

Still, while the various contributors to this volume might differ in what they would see as an ideal IPR regime, we think they all would agree on four propositions: (1) an IPR regime that is well-suited for advanced industrial countries may not be so well-suited for developing countries; the trade-offs between the benefits from improved incentives and the benefits of greater access to knowledge may differ markedly; (2) IPRs are only one component of a country's innovation system, and at least in many countries there has been excessive emphasis on IPRs relative to other ways of supporting, funding, and incentivizing innovation; (3) there are ways to reform IPR regimes, and more broadly the innovation system, in both advanced countries and developing countries that would enhance innovation together with societal welfare. Moreover (4), the adverse consequences for welfare and growth generated by the current IPR regime (including the TRIPS Agreement) are worse for the developing than for the developed countries; the existing regime poses formidable impediments to closing the knowledge gap, which is so essential to developmental success.

The policy prescriptions in this book reflect the variety of views summarized above. They address two different sets of questions.

The first set asks whether one should seek to change the current international IPR regime (basically TRIPS and "TRIPS-plus" standards), and if so, in which directions. The following is a short list of some proposed reforms to IPRs in general.

SOME MODEST PROPOSALS FOR REFORM

1. Push forward the boundaries of Open Science

Private appropriation of basic scientific discoveries in general, and those publicly financed in particular, is bad for science and in the long-term also for industry: it tends to slow down the drive along Vannevar Bush's (1945) *Endless Frontier* of Open Science. As So et al. argue in this volume, one should guarantee at the very least that the fruits of government-funded research be made available on the basis of non-exclusive licensing, that government should retain use rights, and that end products stemming from publicly funded research should be made affordable to the public at large.

We are arguing, in other words, for a rethinking of the ways in which the Bayh-Dole Act put the United States (followed by other countries and piecemeal in the European Union, even if not by a single piece of legislation like in the United States[4]) on the path of allowing universities to appropriate for themselves the fruits of government-funded research. As universities try to glean for themselves as much of the rents from the innovative activity that occurs on their campuses as they can, it has the adverse effect of moving universities away from what they have traditionally been—open and collaborative.

Relatedly we think efforts should be made to

(i) Prevent the patenting of research platforms and research tools;
(ii) Prevent the patenting or copyrighting of algorithms and other research methods.

Some of the authors also argue for measures to:[5]

(iii) Ensure access to life-saving medicines for poor people (in both developed and developing countries) that are produced as a result of government-funded research.
(iv) Ensure access to knowledge that pertains to global warming and other essential public goods.

2. Reinstate the once "universally accepted principle that plant and animal genetic resources are a heritage of mankind and consequently should be available without restrictions"

This principle from the "International Undertaking on Plant Genetic Resources," (1983), (see Chapter 10 in this volume) has been a controversial aspect of on-going international negotiations on the legal framework that should govern access, use and transfer of genetic materials and goods derived therefrom. As Halewood shows, over the last three decades one has seen the proliferation of exclusive forms of control of plants, seeds and living organisms. At the very least—Halewood argues and we fully agree—it is urgent to fully implement the international "quasi-commons" prescribed by the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) (2001), notwithstanding its acknowledgement of national sovereignties and IPRs. Similarly, the Convention on Biological Diversity attempts to balance the rights of those countries having an abundance of genetic resources (biodiversity), with the need for incentives to preserve that biodiversity (for those countries largely in the South), and with incentives for corporate interests, some in developing countries and many in developed ones exploiting these genetic resources.

3. A major change in the boundaries between public research and for-profit activities in medical research and pharmaceuticals?

One of the sectors in which IPRs in the form of patents *do* matter is pharmaceuticals. But this is also where the current IPR regime reveals how deeply flawed, expensive and possibly counterproductive it is. In a nutshell, the current system works as follows. The first stage of research on new molecules addressing particular pathologies and on the mappings between genes and pathologies themselves is overwhelmingly undertaken in public institutions, including universities, and financed by public entities, such as the National Institutes of Health (NIH) in the United States. Promising molecules and promising genetic targets are then picked up by private firms, generally with the acquisition of a universally held patent with the intermediation of a (rent-seeking) biotech, which in turn transfers it to "big pharma" companies.

The drugs that make it to clinical trials are then tested, typically by the pharmaceutical companies, on humans in hospitals which are partly (in the United States) or almost entirely (in Continental Europe) public, under condition of conflict of interest,[6] since the drug companies want the data to support the approval of the drug. Finally, if the drug obtains the approval of the FDA or equivalent agencies in Europe and Japan, it is put on the market. A large fraction of the sales is to a public buyer—more than 50 per cent in the United States and a much higher share in Europe, at a price incorporating a mark-up on research and testing costs. At the end of the day, the public pays for the drug both through backing the original research, and then again by buying the drug itself on behalf of the patients. And all this without controlling the directions of research, that is the selection of the would-be drugs which are taken through clinical trials (and thus, indirectly, of the pathologies which are addressed).[7] In the United States and most other countries, the drug companies have even resisted creating a formulary, which would pay for drugs on the basis of efficacy and cost effectiveness.

The system, while very costly, does not appear even to be efficient in terms of innovative output: the New Chemical Entities (that is, discretely novel drugs as opposed to marginal variations over existing ones) approved by the FDA are of the order of a couple of dozen per year at best; drug firms undertake marketing expenditures that are more than three times their research spending (Angell, 2004). The drug companies have been especially neglectful of the diseases that most afflict the developing countries, and especially the poor in those countries.[8]

There are many alternatives to this system, including moving to a prize system; and/or to have the public (i.e. public agencies such as the NIH) not only perform the research but also fund the clinical trials,[9] and then license on a non-exclusive basis the production of the drugs to pharmaceutical companies, which at that point would have to price at (near) marginal costs. Not only would such a system be socially more efficient and reliable (without the

inherent conflicts of interest in the current arrangements), but it would actually save the taxpayer money. At present, given that a very large percentage of the costs of medicine are paid for by the public, the consequences of inefficiencies and monopoly pricing are inevitably borne by taxpayers.

SOME POLICY OPTIONS CONCERNING "CATCHING-UP" IN DEVELOPING COUNTRIES

The second set of questions posed in this book is about how developing countries can best cope with the imperfections of the current IPR regime while, for instance, preserving their chances of catching up in the knowledge economy and protecting the health of their citizens. We also ask how the world as a whole can safeguard the openness of scientific discoveries, encourage the preservation of and access to biological diversity, and ensure the full humanitarian use of technological advances.

The advocates of the current regime claim that it will benefit developing countries, and not just provide more rents for the firms of the developed countries. By contrast, we hope to convince readers of this book that the historically unprecedented international harmonization of IPRs, "upward" toward a tighter regime under the TRIPS Agreement and subsequent bilateral or regional Free Trade Agreements, is harmful for the development process in general and for developing countries in particular. It not only fails to enhance the process of accumulating technological capabilities by domestic firms—which is at the core of the development process (more in Cimoli, Dosi and Stiglitz, 2009)—it also hinders learning by putting serious limits on access to knowledge (and thus presents impediments to closing the knowledge gap) so essential if firms in developing countries are to catch up with the more technically advanced countries.[10] It also harms developing countries because of the increased rents that they have to pay, especially for pharmaceuticals, which not only reduces funds available for a broad range of developmental objectives, but also undermines public health.

It would be different if these stronger IPRs, say, for medicines, had led to more innovation focused on the diseases and health problems prevalent in developing countries. But it has not. While the evidence of adverse effects from tighter IPRs, especially in pharmaceuticals, is clear, the purported developmental benefits—that some firms with high IPR content in their products will be deterred from locating in countries with weak IPR protection—is ambiguous at best.[11]

Hence, from a normative point of view, reforms of the TRIPS-based international regime in the direction of *looser* IPR protection—towards what

is sometimes called a TRIPS-minus regime—should be welcomed in developing countries. Unfortunately, the United States, with its bilateral Free Trade Agreements, and Europe, with its so-called Economic Partnership Agreements, have been pushing the world towards a TRIPS-plus regime.[12]

We should emphasize (as many of the chapters in this book do), that it is wrong to view IPR regimes through a simplistic lens that sees them as just tougher or looser. Rather, there are a myriad of provisions that affect the developmental impact of IPRs. We agree with the General Assembly of the World Intellectual Property Organization (WIPO) that we need a *developmentally oriented intellectual property regime,* and that TRIPS is *not* such a regime as it stands.

However, even if the TRIPS Agreement is not reformed, there is much that developing countries can do *within* the current regime to promote innovation and societal well-being, as discussed in several chapters in this volume (in particular those by Allarakhia; Reichman; Maskus and Okediji; Correa; and also Maskus and Reichman (2005).

They include:

(i) The development of open source commons, such as those illustrated by Chapter 11 in this volume on biotechnological and pharmaceutical knowledge in India and Brazil, and a legal framework to support the commons.

(ii) A more extensive use of utility models (petty patents) that protect small-scale innovations essentially by domestic producers in developing countries.[13]

(iii) A greater use of prizes and grants (both in developed and developing countries) for rewarding innovators as an alternative to patents. (Even better, would be a global framework for prizes, as suggested by the World Health Organization for diseases affecting the developing countries.)[14]

(iv) There are many choices in the design of an IPR regime even within TRIPS: more restrictive granting of patents, e.g. avoiding minor variations that attempt to "evergreen" patent products, easier forms of opposition to the granting of patents;[15] and use of a "liability" rule, whereby injunctive relief for violating a patent would be severely limited, and those who used existing inventions in follow-on innovation would have to pay appropriate compensation for the use of someone else's intellectual property.[16]

(v) A fuller exploitation of the "flexibilities" allowed by TRIPS, such as those allowing in some circumstances compulsory licensing and other exceptions to the full IPR protection.[17]

(vi) Excluding from patent eligibility all claims on human life or life processes and reaffirming that patents on environmentally sound

technologies are subject to the full range of limitations and exceptions set out in TRIPS, at a minimum.[18]

(vii) Resisting provisions in bilateral or multilateral preferential trade agreements involving "super-TRIPS" clauses that basically eliminate the "flexibilities" allowed by TRIPS or require the parties not to trade in goods originating from third countries making use of such "flexibilities."[19]

We believe that these measures could be beneficial to the development process as a whole. However, as discussed in Cimoli, Dosi and Stiglitz (2009), one should not forget that IPR-related measures—and even the broader reforms in national innovation systems—are just a part of a much larger picture of broadly defined industrial policies which, if well designed, can nurture the birth and growth of technologically competent and increasingly innovative firms in catch-up countries.

Intellectual property rights are not, as we have emphasized, an end in themselves. They are a means to forging more prosperous economies, with rising standards of living. Developing countries should subject all proposals for IPR regimes to a simple standard: the extent to which such a regime promotes the prosperity and well-being of their citizens.

NOTES

1. Maskus & Okediji (this volume).
2. There is a long line of papers that are critical of the current IPR regime. See Boldrin and Levine (2008b), Odagiri et al. (2010), Jaffe (2000).
3. Chapter 1, as well as several of the other chapters, have detailed the precise mechanisms through which patents impede innovation—including adverse effects on openness and the flow of information.
4. See Siepmann (2004).
5. Chapters 5 and 7 in this volume argue that scientific research has to be properly supported in *ethical terms*. (See also the concluding remarks in Mazzucato and Dosi, 2006). There are public policies which are *good in their own right*, from the safeguard of justice to the pursuit of knowledge, to the right of access to health care.
6. The testing system's reliability is not only compromised by these conflicts of interest, but costs are increased, since testing is often intertwined with marketing. Doctors who participate in the testing of a successful drug are more likely to prescribe that drug, and perhaps even to convince others of its benefits.
7. Reichman (2009b).
8. Not a surprise, as several chapters point out in so far as profits drive innovation (which is not even often the case), and the poor do not have the money to spend on drugs that the rich do.
9. Jayadev, A. and Stiglitz, J.E. (2009, 2010); Reichman (2009b).

10. Our findings are thus consistent with (though go beyond) those of the World Commission on the Social Dimensions of Globalization (2004).
11. For some discussion of this see Chapter 2 in this volume. See also, Keith E. Maskus (2012).
12. E.g. with data exclusivity. See Charlton and Stiglitz, 2005 and Stiglitz, 2006. As this book goes to press, there is concern, for instance, that the Trans Pacific Partnership agreement, now under negotiation, will provide still further impediments in the access to generic medicines, rolling back improvements that were incorporated into, e.g., the Peru–U.S. bilateral trade agreement.
13. Utility models, as discussed also in several chapters of this book, are minor variations on incumbent product and processes, most often undertaken by local producers in catching-up countries, but too "minor" to fulfil the criteria of a nonobviousness (inventive step) enshrined in contemporary patent regimes. In fact they were widely used by now developed countries, such as Germany and Japan, in their industrialization phase (see Chapter 2 in this volume and Odagiri et al., 2010). Our proposal is indeed that their use should be confined to developing countries only and in that to domestic producers who undertake often minor "creative imitations." On the contrary, allowing the use of utility models by "frontier" companies and countries would just strengthen their monopqlistic positions and increase entry barriers into innovative activities. We note that this is an area where the IPR regime for developing and developed countries should probably differ, which would require amending the national treatment rules of the Paris Convention and TRIPS. Strong arguments have been put forward that for developed countries, utility models actually impede the pace of innovation, encouraging research, e.g. on small innovations rather than larger, more transformative ones.
14. See also Love (2005) and Stiglitz, (2004, 2006).
15. See Henry and Stiglitz (2010).
16. See Chapter 1 and Reichman, Lewis (2005), and generally UNCTAD (2011).
17. Reichman, Chapter 4 in this volume.
18. In fact, some of the co-editors would go further by imposing restrictions that go beyond those explicitly stated in TRIPS: a sort of "TRIPS minus" somewhat along the lines suggested by, e.g., the ILO World Commission on the Social Dimension of Globalization (ILO, 2004). The Rio Convention also imposed "flexibilities" in the form of compulsory licensing for technologies related to climate change.
19. See Chapter 15 in this volume.

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