

Intellectual Property in the Twenty-First Century: Will the Developing Countries Lead or Follow?

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Intellectual Property in the Twenty-First Century: Will the Developing Countries Lead or Follow?

Jerome H. Reichman*

I. Introduction

The exact connection between intellectual property and economic development varies over time from country to country and region to region. For example, one cannot doubt that intellectual property laws played a major role in United States development and economic growth over the past three decades. Yet, the moment we dig deeper, we discover that, until 1982, the United States had one of the world's most pro-competitive patent laws (i.e., least protective); until 1978, it had relatively weak copyright laws; and until the 1980s, it had one of the world's most interventionist competition laws along with a robust doctrine of patent misuse. Somehow, the U.S. economy managed to survive and thrive in this relatively low protectionist, highly competitive environment.

Similarly, Japan, India, China, Korea, Malaysia, and Brazil all managed to attain relatively high levels of economic growth without strong intellectual property rights. Indeed, the astounding success of the Indian Pharmaceutical industry since the 1970s was achieved by means of a state policy that largely prohibited the patenting of medicinal products as such.¹ This reminds us that intellectual property rights are but one component of overall economic growth; that different states have different factor endowments; and that in many countries, especially those at an early stage of development, a sound agricultural policy or a sound pro-competitive industrial policy with a supportive political and legal infrastructure are more likely to stimulate economic growth than intellectual property laws.²

At the same time, we may confidently agree that, countries such as Russia, China, India, Brazil, Korea, Malaysia, Indonesia, Argentina, South Africa, and many others, will not reach their full economic potential without adequate intellectual property regimes. Indeed, this observation holds true for so many emerging economies that it makes our task easier today. For example most Asian countries are already committed to becoming

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¹ See, e.g., Amy Kapczynski, *Harmonization and Its Limits: A Case Study of TRIPS Implementation in India's Pharmaceutical Sector* (Draft 2009)

² See generally KEITH MASKUS (IIE 200?)

players in what has been called the knowledge economy. These countries will not reach the frontiers of that economy, and convert its intangible, nonrivalrous outputs into tradeable knowledge goods, without adequate intellectual property laws and policies, along with a whole set of interrelated economic and political foundations that are essential to maintaining a viable post-industrial economy.³

The moment we look at Asia, as a regional group, from this perspective, we see how the IP scenario has changed over the past twenty-five years, i.e., since the OECD countries began to press for higher, relatively harmonized worldwide IP standards under the aegis of what eventually became the TRIPS Agreement of 1994.⁴ As many critical thinkers have written, the TRIPS Agreement produced a regime that deliberately favored those OECD countries that already had developed national systems of innovation in place and whose multinational companies owned plenty of patented high-tech products to sell or manufacture around the world.⁵ There was a built in disposition to favor big companies seeking rents from existing innovations—or those in the pipeline—at the cost of making future innovations more difficult, especially for less technically advanced countries.⁶ As Robert Ostergard recently put it, TRIPS embodied a “development dilemma” for poorer countries:

[I]f they open their domestic markets to trade, they face political and economic pressure to protect foreign IP; if they protect foreign IP, they create conditions that force them to abandon their goal to obtain IP as inexpensively as possible.⁷

Of course, these IP concessions were partly offset by trade concessions in other areas (side payments), such as textiles, agriculture, and traditionally manufactured goods, a calculus that worked differently for different countries.

Yet, as often happens in international law, efforts to rig a regime for short term advantages may turn out, in the medium and long term, to boomerang against those who pressed hardest for its adoption. In my very first article on this subject, I warned that, by reaching for high levels of international protection (that could not change in response to less favorable domestic circumstances), technology exporting countries risked fostering conditions that could erode their technological superiority and resulting balance of

³ See, e.g., Daniel Gervais, *TRIPS and Development*, in INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT, 3-60 (D. Gervais, ed., Oxford U. Press, 2007) [hereinafter IP, TRADE AND DEVELOPMENT]; Peter Yu, *Intellectual Property, Economic Development, and the China Puzzle*, in IP, TRADE AND DEVELOPMENT, *supra*, 173-220.

⁴ TRIPS Agreement cite. See Reichman (1998).

⁵ See, e.g., SUSAN SELL, I & II.

⁶ See, e.g., DRAHOS & BRATHWAITE; Jerome H. Reichman & Rochelle Cooper Dreyfus, *Harmonization Without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L. J. 85 (2007).

⁷ Robert L. Osterard, Jr., *Economic Growth and Intellectual Property Protection: A Reassessment of the Conventional Wisdom*, in IP, TRADE AND DEVELOPMENT, *supra* note 1, 115, 155.

payment advantages over time.⁸ As other technology importing countries discovered and cultivated their own innovative strengths and capacities, they would benefit both from the worldwide system of incentives and protections that the TRIPS Agreement established, as well as from location and other endowment factors,⁹ at the expense of leading developed countries that took their own technical superiority for granted. In short, given the “incipient transnational system of innovation” that had begun to emerge from the TRIPS Agreement,¹⁰ there was every reason to expect that the BRIC group as a whole, and many other emerging economies, would gradually become major competitors in the knowledge economy itself, with growing potential to match and challenge the advanced OECD countries’ pre-existing comparative advantages in this area.

That this transformation has been occurring all around us is too solidly evidenced for us to review here in detail.¹¹ What I wish to focus on, instead, is how the developing countries with growing technological prowess should best seek to accommodate their own national systems of innovation to the worldwide intellectual property system emerging in the post-TRIPS period, with a view to maximizing global economic welfare in the foreseeable future.

II. Avoiding Protectionist Excesses

High-protectionist visions of intellectual property law have become a kind of latter day religion promoted by special interests representing “a knowledge cartel” that has dominated the political scene in the U.S., EU and Japan.¹² My preliminary advice to the BRIC countries in particular is to inoculate themselves against succumbing to these same high-protectionist illusions while there is still time. If it is true, as Prof. Gervais says, that a country cannot play in the knowledge economy without IPRs,¹³ experience in many OECD countries is demonstrating that badly configured, unbalanced, over-protectionist IP regimes gradually stifle innovation by making inputs to future innovation too costly and too cumbersome to sustain over time.¹⁴ Such regimes also enable large corporations

⁸ J.H. Reichman, *Intellectual Property in International Trade: Opportunities and Risks of a GATT Connection*, 22 VAND. J. TRANSNAT’L L. 747, ___ (1989). For evidence that this inversion is occurring within the Indian pharmaceutical industry, see Kapczynski, *supra* note 1.

⁹ See esp. Yu, *supra* note

¹⁰ See Keith E. Maskus & Jerome H. Reichman, *The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods*, in INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED INTELLECTUAL PROPERTY REGIME 3, 33-41 (K.E. Maskus & J.H. Reichman eds., Cambridge, 2005) [hereinafter INTERNATIONAL PUBLIC GOODS AND IP]. See also Jerome H. Reichman, *Richard Lillich Memorial Lecture: Nurturing a Transnational System of Innovation*, 16 J. TRANSNAT. L. & POL. 143 (2007).

¹¹ See, e.g., Maskus and Maskus & Fink (various cites).

¹² See, e.g., DRAHOS & BRAITHWAITE, *supra* note ___; Maskus & Reichman, *supra* note 10 (citing authorities). But see EUROPEAN PATENT OFFICE, SCENARIOS FOR THE FUTURE (2007) (evaluating four competing scenarios for the evolution of IP regimes with very different and conflicting premises and outcomes).

¹³ See Gervais, *supra* note 3

¹⁴ See Jerome H. Reichman and Rochelle Cooper Dreyfuss, *Harmonization without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L.J. 85, 102-08 (2007). See also Jerome H. Reichman & Ruth Okediji, *Empowering Digitally Integrated Scientific Research: The Pivotal Role of Copyright Law’s Limitations and Exceptions*, (Draft, May 2009).

that are sometimes slothful innovators to accumulate pools of cross-licensed patents that create barriers to entry for truly innovative small and medium-sized firms.¹⁵

It is widely recognized that the patent system in the United States is emerging from a period of crisis. Among other problems, the cumulative costs of litigation generated by a plethora of incautiously granted patents that increasingly pervaded the upstream research dimension threaten to exceed the aggregate returns from patented innovation as such, especially in the field of information technologies.¹⁶ There is no consensus about how to reform the system, despite broad agreement that reforms are needed. As time passes, the demands of different industries—particularly the information technology and biotechnology sectors—become more contradictory and conflictual.¹⁷ The European Patent Office has expressed similar concerns about the uncertain future of the world patent system.¹⁸

None of these domestic tensions has deterred either USTR or the European Commission (EC) from demanding that the rest of the world should adopt a proposed Substantive Patent Law Treaty that, at the international level, would lock in place most of the very unsolved problems that confront the domestic system of innovation in the U.S. The rest of the world might logically ask which version of U.S. patent law USTR now seeks to export, given that the United States Supreme Court has so profoundly changed it in a series of recent cases.¹⁹ By the same token, one may also ask why certain Asian patent offices blandly supported these same proposals for a further upward ratcheting of international patent norms. It was as if their governments were saying, please give us all your insoluble problems and contradictions as soon as possible, so we can undermine our own national systems of innovation, too.²⁰

Of course, the more that high growth developing countries become players in the knowledge economy, the more they share some of the fears and risks that usually underlie the demand for higher levels of protection by powerful sectors of the advanced technology-exporting countries. For example, Asian entrepreneurs want their own exports of knowledge goods protected in the developing countries whose markets they increasingly penetrate through FDI, licensing, or sales of high tech products. They also want to maintain inward flows of FDI and market-driven technology transfer into their own countries, in order to bolster their own growing technological capacities. Yet, such concerns do not necessarily add up to a compelling case for higher levels of international

¹⁵ Karl Shapiro, *Navigating the Patent Thicket*. Properly designed IPRs do, however, protect innovative small and medium-sized firms from the predatory practices of their larger competitors.

¹⁶ See BESSEN & MEURER (2008); JAFFE & LERNER (2004); *see also* MICHAEL HELLER, *THE GRIDLOCKED ECONOMY* (2008).

¹⁷ Reichman & Cooper Dreyfuss, *supra* note 14,

¹⁸ See EPO Report (2007), *supra* note 12.

¹⁹ See, e.g., *EBay Inc. v. MercExchange, LLC.*, 547 U.S. 388 (2006); *MedImmune, Inc., v. Genentech*, 549 U.S. 118 (2007); *KSR v. Teleflex*, 550 U.S. 398 (2007); *Quanta Computer v. L.G. Electronics*, 553 U.S. ____ (2008); *Microsoft v. AT&T Corp.*, 550 U.S. 437 (2007); *see also In re Bilski*, 545 F.3d 943 (Fed. Cir. 2008) (en banc).

²⁰ For the view that “transnational legal culture” may link developing country patent offices into epistemic communities detached from broader policy considerations, *see* Kapczynski, *supra* note 1; *see also* CAROLYN DEERE, *THE IMPLEMENTATION GAME* (2009).

intellectual property protection. On the contrary, the TRIPS Agreement itself provided an unprecedented platform of IP protection for exports after 2000,²¹ and there is little evidence that this platform remains inherently insufficient for the needs of Asian exporters, or those of other developing countries, in the foreseeable future. Meanwhile, there is mounting evidence of an ambiguous relation between FDI and IPRs, rooted in the fact that OECD technology exporters need entry into emerging economies as much as these countries need FDI and market driven technology transfer from the OECD countries.²²

In China and India, moreover, knowledge economy skills and capacities have reached the point where the stimulating effects of IPRs can influence different sectors and stakeholders quite differently, depending on the extent to which they are still driven by imitation-related innovation or investments in basic, or at least relatively original, R&D.²³ Increasingly, we see tensions between those who demand relatively strong patent protection for, say, research-driven pharmaceuticals, and those who demand a more forgiving, pro-competitive approach favoring generic pharmaceutical producers and exporters.²⁴ In either case, how to protect cumulative and sequential innovation—as distinct from path-breaking innovation—becomes an ever more pressing problem as more small and medium-sized firms acquire a taste and capacity for such innovation.²⁵

A parallel set of problems that the BRIC countries, and even middle-income developing countries, increasingly face is how to adjust the shifting relations between private and public goods. Education, public health, agricultural improvement, scientific research and other important areas are still heavily dependent on the public sector in many of these countries. Yet, international intellectual property rights throw up roadblocks to the acquisition of needed scientific²⁶ and educational materials,²⁷ essential medicines,²⁸ and both seeds, stocks, and fertilizers needed for economic growth.²⁹ Whether these same

²¹ See TRIPS Agreement, *supra* note ____, art 65.2 (end of transition period for developing countries). For pharmaceuticals, the effective transition period ended in 2005. See *id.*, art 65.4. For some 32 Least-Developed Countries (LDCs), the transition period for patents in general need not end until 2013 and for pharmaceuticals, until 2016. See (cites).

²² See Yu, *supra* note

²³ See, e.g., *id.*; Kapczynski, *supra* note 1 (with regard to pharmaceuticals in India). See also Shaver (regarding software in Brazil).

²⁴ See, e.g., Kapczynski, *supra* note 1; Janice Mueller, *The Tiger Awakens*

²⁵ See, e.g., Reichman & Cooper Dreyfus, *supra* note ____.

²⁶ See, e.g., JAMES BOYLE, *THE PUBLIC DOMAIN* (2008); Jerome H. Reichman, Paul F. Uhlir, and Tom Daederwerder, *Designing the Microbial Research Commons* (Brussels draft, May 2009); J.H. Reichman & Paul F. Uhlir, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 77 L. & CONTEMP. PROBS. 315 (2003).

²⁷ Ruth L. Okediji, *Sustainable Access to Copyrighted Digital Information Works in Developing Countries, in International Public Goods and IP*, *supra* note ____, 142; Margaret Chon, *supra* note ____, at ____.

²⁸ Frederick M. Abbott & Jerome H. Reichman, *The Doha Round's Public Health Legacy: Strategies for the Production and Diffusion of Patented Medicines under the Amended TRIPS Provisions*, 10 JIEL 921-87 (2007).

²⁹ Michael Blakeney, *Stimulating Agricultural Innovation*, in *INTERNATIONAL PUBLIC GOODS AND IP*, *supra* note 10, 367; Robert E. Evenson, *Agricultural Research and Intellectual Property Rights*, in *INTERNATIONAL PUBLIC GOODS AND IP*, *supra* note ____, 188; Timothy Swanson & Timu Goeschl, *Diffusion*

types of impediments will adversely affect the drive for environmental technologies remains to be seen.³⁰ What seems clear is that, even with regard to the role of public sector investment in basic research, which has been crucial in the most developed countries, there remains great uncertainty about the kind of regulatory regimes that should be adopted to ensure an appropriate social return from publicly funded or publicly generated research initiatives.³¹

III. Designing Intellectual Property Laws for the Twenty-First Century

As the high and middle-income developing countries seek to strengthen their own national systems of innovation, they must decide how to address the challenges posed by a now highly articulated worldwide intellectual property system. Roughly speaking, there are two different approaches on the table. One is to play it safe by sticking to time tested IP solutions implemented in OECD countries, with perhaps a relatively greater emphasis on the flexibilities still permitted under TRIPS (and not overridden by relevant FTAs).³² The other is to embark upon a more innovative and even experimental approach, with a view to addressing and perhaps solving the very problems that the advanced technology exporting countries currently find so daunting.³³

A. From Fair Followers to “Counter Harmonization”³⁴

Most technical assistance experts and many academics take the view that developing countries should stick to time tested IP solutions while exploiting available exceptions and limitations recognized by developed countries. This approach affords the advantages of requiring relatively modest lawyering inputs (although it still requires more lawyering than one might think³⁵); it may reduce internal debate about appropriate solutions; and it

and Distribution: The Impact on Poor Countries of Technological Enforcement within the Biotechnology Sector, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 669. See also Halewood.

³⁰ See, e.g., Jerome Reichman, Arti K. Rai, Richard G. Newell & Jonathan B. Wiener, *Intellectual Property and Alternatives: Strategies for Green Innovation*, Chatham House Energy, Environment and Development Program Paper: 08/03, Preliminary Discussion Draft, Nov. 10, 2008; Frederick Abbott, ICTSD paper; Keith Maskus & Ruth Okediji, ICTSD paper.

³¹ See, e.g., Anthony D. So, Bhaven N. Sampat, Arti K. Rai, Robert Cook Deegan, Jerome H. Reichman, Robert Weissman & Amy Kapczynski, *Is Bayh-Dole Good for Developing Countries? Lessons from the U.S. Experience*, 6 PLoS Biology (No. 10) e262 (Oct. 2008), pp. 2078-2084; Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 L. & CONTEMP. PROBS. 289 (2003).

³² See, e.g., Gervais, *supra* note ___; Gervais, *Epilogue—TRIPS: An Implementation Tool Box*, in IP, TRADE AND DEVELOPMENT, *supra* note , 527-46. See also CAROLYN DEERE, *supra* note . This was my own position in the 1990s, and both Japan and Korea have moved successfully along this route. See J.H. Reichman, *From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement*, 29 NYU J. INT'L L. & POLITICS 11 (1996/1997).

³³ See Jerome H. Reichman and Rochelle Cooper Dreyfuss, *Harmonization without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L.J. 85, 102-08 (2007). See also Duffy,

³⁴ In 2007, Professor Cooper Dreyfuss and I expressed the view that developing countries should experiment with solutions to the IP problems encountered in developed countries. See Reichman & Cooper Dreyfuss, *supra* note; Duffy, *supra* ___. Professor Kapczynski has now coined the felicitous term of “Counter Harmonization,” which I gratefully adopt here. See Kapczynski, *supra* note 1, at .

³⁵ See, e.g., Gervais, *Epilogue—TRIPS*, *supra* note __; Carlos Correa, *TRIPS and TRIPS-plus Protection and Impacts in Latin America*, in IP, TRADE AND DEVELOPMENT, *supra* note , 221-58.

may deflect political and economic pressures from powerful countries whose own prior practices cast a comforting shadow.³⁶

While this strategy may thus remain politically expedient, Professor Dreyfuss and I are skeptical for one main reason. At the end of the day, discreetly following in the technology-exporting countries' IP footsteps will merely bring the high and middle income developing countries face to face with the very serious problems that the OECD countries have themselves failed to solve. It will place everyone in an equally unsatisfactory position, without having enhanced the governance skills of developing countries and without enriching the incipient transnational system of innovation with much needed empirical evidence about alternative IP solutions to an array of apparently intractable problems.³⁷

Consider, for example, the choking and blocking effects that a proliferation of patents rooted in low nonobviousness standards increasingly produced for the software and, arguably, biotech industries in the United States and elsewhere.³⁸ This phenomenon elicits pressures for “quality patents” that would presumably result from higher nonobviousness standards,³⁹ and the U.S. Supreme Court has recently taken a first step in this direction,⁴⁰ pending further legislative reforms on the table.⁴¹ But higher nonobviousness standards, without more, will also expose large quantities of costly cumulative and sequential innovation to free-riding forms of market failure, which was the risk that induced the Federal Circuit to lower its nonobviousness standard in the first place.⁴²

From this perspective, both the U.S. and foreign experience reveal a cyclical or pendular shifting between states of under and over protection,⁴³ without policymakers ever having seriously addressed the underlying question of how appropriately to protect cumulative and sequential innovation at the core of present day technological progress.⁴⁴ This same question has now begun to surface in countries such as India and China.⁴⁵ For example,

³⁶ Cf. Kapcszynski, *supra* note 1; Jerome H. Reichman, *Compulsory Licensing of Patented Pharmaceuticals: Evaluating the Options*, 37 J. LAW, MED. & ETHICS __ (forthcoming 2009).

³⁷ See Reichman & Cooper Dreyfus, *supra* note __, at __.

³⁸ See, e.g., Arti K. Rai (software); Rebecca S. Eisenberg, *Noncompliance, Nonenforcement, Nonproblem? Rethinking the Anticommons in Biomedical Research*, 45 HOUSTON L. REV. 1059 (2008); M. A. Heller & R. S. Eisenberg, *Can Patents Deter Innovation? The Anticommons in Biomedical Research*, 280 SCIENCE 698 (1998).

³⁹ See, e.g., FTC Report (2003); NAS Report.

⁴⁰ KRS decision (US 2007); *Bilski* (Fed. Cir. 2009).

⁴¹ Senate and House Bills. However, legislative efforts to further refine the nonobviousness standard are no longer apparent in the pending bills, after the Supreme Court's decision in KRS. See Bruce (Duke Conference). See generally Jay Thomas (Duke Conference).

⁴² See, e.g. Jerome H. Reichman, *Of Green Tulips and Legal Kudzu: Repackaging Rights in Subpatentable Innovation*, VAND L. REV. (2001).

⁴³ See, e.g., J.H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUMB. L. REV. 2432 (1994); J.H. Reichman, *Charting the Collapse of the Patent-Copyright Dichotomy: Premises for a Restructured International Intellectual Property System*, 13 CARDOZO ARTS & ENTERTAIN. L.J. 475 (1995).

⁴⁴ See Jerome H. Reichman, *Saving the Patent Law from Itself*

⁴⁵ Janice Mueller (1) and (2); Mashekar Report. For China, see Yu, *supra*

efforts to codify a relatively stiff standard of nonobviousness in the new Indian patent law were self-consciously aimed at freeing up space for India's thriving generic pharmaceutical industry. But these same efforts elicited explicit complaints that India's adoption of stiff eligibility standards would deprive the more research-driven pharmaceutical sector of sufficient incentives to invest in derivative applications of medicines initially developed abroad.⁴⁶ Besides an appropriately selective nonobviousness standard, in other words, India and similarly situated developing countries need an appropriately designed domestic regime that stimulates investment in cumulative and sequential innovation without creating barriers to entry and without unduly hindering the transformation of today's technological outputs into inputs for tomorrow's follow-on applications.⁴⁷

Of course, the traditionalists may respond by recommending greater use of utility model laws,⁴⁸ and there is a trend towards enacting such laws in the developing countries, including China.⁴⁹ But the limits and weaknesses of patent-like utility model laws have been well documented since the 1970s at least, and their inherent logical contradictions are matched by equally daunting economic contradictions, even if such regimes often prove better than nothing.⁵⁰ Moreover, the Japanese experience demonstrates that advantages accruing from the use of utility models to surround foreign patents with tripwires of small-scale blocking effects tend to peter out once the country relying on this tactic shifts its own domestic emphasis to relatively basic research. Sooner or later, utility model laws simply re-propose the same fundamental tensions that arise when too many patents cluster around the same rapidly developing technologies, each of which is dependent on preceding innovation and will likely stimulate equally dependent successive applications.⁵¹

In other words, the clear boundaries between property rights that are a presupposed necessary condition for efficient trading of knowledge goods have become inherently blurred and overlapping as a consequence of the patent law's struggle to keep abreast of the changing conditions of technological progress.⁵² Why should the BRIC countries, for example, not address this and other related problems head on, instead of falling into the same old traps and pitfalls that undermine the systems of innovation in the most developed countries?

That the traditionally structured OECD innovation framework has become increasingly "brittle" over time⁵³ appears from even a quick review of its three main premises:

⁴⁶ See *supra* note 45.

⁴⁷ See Reichman, *Green Tulips*, *supra*

⁴⁸ See J.H. Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, *supra* note ___.

⁴⁹ Lulin Gao, *The Third Amendment of Patent Law and Its Implementation Regulations in China*, Paper presented at the Second Global Forum on Intellectual Property 2009, June 8-9, Singapore.

⁵⁰ See, e.g., Reichman, *Green Tulips* (citing authorities); see also 1974 Swiss study.

⁵¹ See *esp.* Eisenberg (2008), *supra* note 38.

⁵² BESSEN & MEURERE (2008); Eisenberg (2008); Reichman & Cooper Dreyfuss (2007)

⁵³ Remarks of Jeff Yu, Second Global Forum on Intellectual Property 2009, June 8-9, Singapore.

- (1) Upstream scientific research, primarily theoretical in nature, was to remain immune from IPRs and regulated by the sharing norms of Mertonian science;⁵⁴
- (2) Routine innovation (largely cumulative and sequential in nature) was primarily protected as know-how by trade secret laws, which established a vast semi-commons accessible to all routine engineers willing to reverse-engineer by honest means; it therefore provided investors with natural lead time;⁵⁵
- (3) Legal monopolies were to be bestowed only on significant inventions, beyond the reach of routine engineers, while competition rooted in legally protected lead time and other comparative advantages drove the innovation process.⁵⁶

Today, instead, universities aggressively patent government-funded research results;⁵⁷ many countries protect even scientific databases as such,⁵⁸ and there is no clear line between theoretical and applied research. The sharing norms of science have broken down to the point where they can only be maintained by carefully constructed scientific commons that artfully manage legal, economic and technical restrictions on data, materials and information.⁵⁹ At the same time, the technical know-how underlying cumulative and sequential innovation can seldom be kept secret for very long. Hence, trade secret protection also breaks down, and investors faced with mounting front end costs suffer from a chronic shortage of natural lead time.⁶⁰

In response, patents, copyrights and sui generis laws expand in all directions to absorb cumulative and sequential innovations that lack other refuges from free-riding appropriators and the risk of market failure.⁶¹ This trend, in turn, produces mounting thickets of rights that impede both technological progress and research,⁶² while the risk of endless litigation over uncertain legal boundaries leads to daunting litigation costs and anticompetitive, defensive patent pools held by big but often slothful technology distributors.⁶³

B. Where Developing Country Leadership Could Make a Difference

The incipient transnational system of innovation emerging from the TRIPS Agreement will simply reproduce these same unpropitious conditions if the BRIC countries and their

⁵⁴ Eisenberg; Rai, Northwestern L.Rev.

⁵⁵ Reichman, *Saving the Patent Law from Itself*; Reichman, *Legal Hybrids*, supra note

⁵⁶ See supra note ___.

⁵⁷ Nelson et al, *Ivory Tower*; So et al, supra note

⁵⁸ See, e.g., Paul A. David, *Koyaanisquatsi in Cyberspace: The Economics of an “Out-of-Balance” Regime of Private Property Rights in Data and Information*, in INTERNATIONAL PUBLIC GOODS AND IP, supra note ___, 81; J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?* 50 VAND. L. REV. 51 (1997). See generally DERCLAY, Book.

⁵⁹ See, e.g., Reichman & Uhlir, supra note __; Peter Lee; Science Commons, supra note __.

⁶⁰ Reichman, *Green Tulips*, supra note __.

⁶¹ See, e.g., Pamela Samuelson et al, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994); Reichman, *Legal Hybrids*, supra note

⁶² See, e.g., BESSEN & MEURER, supra note __; Karl Shapiro, *Navigating*, supra note

⁶³ See, e.g., Eisenberg (2008), supra note ___; Rai

allies discreetly follow the models embedded in the most developed intellectual property systems. What we need instead are new models experimentally derived from bold new attempts to deal directly with these and other unsolved problems.

I cannot, within the confines of this short paper, explore these problems in depth, although more and more academic attention is being focused upon them.⁶⁴ Let me instead put forward a partial list of initiatives that the BRIC countries, and other emerging economies, working perhaps within the framework of a WIPO Development Agenda,⁶⁵ could consider. The list is not meant to be exhaustive, only suggestive, but it does give an idea of the kind of initiatives that are needed.

1. Measures Concerning Patents

In 1997, I suggested that developing countries could accommodate international minimum standards of patent protection to their national development goals by adopting relatively stringent eligibility standards covering subject matter, novelty, nonobviousness and disclosure.⁶⁶

a. Eligibility Standards in BRIC Countries

The one country that has most aggressively pursued this strategy is India, with particular emphasis on pharmaceutical products.⁶⁷ India's patent eligibility standards are reinforced by pre-grant and post-grant opposition procedures,⁶⁸ which many other high and middle-income developing countries would do well to consider.

The level of nonobviousness to be established under the pending Third Amendment of the Chinese Patent Law was not clear at the time of writing.⁶⁹ The new law definitely adopts a broader absolute standard of novelty than before,⁷⁰ and it will allow a prior art defense to an infringement action that “to some extent shifts [the] validity issue of a patent from... [the examiners] to the court.”⁷¹ The Chinese law will also require disclosure of origin for genetic resources, and may invalidate the patent if laws and regulations pertaining to licit procurement and use of such resources have been violated.⁷²

In general, we may say that the problems of low quality patents that recently plagued developed countries would become more pernicious if allowed to take root in high and middle-income developing countries. In particular, low standards of nonobviousness would allow powerful foreign companies that accumulate patents on incremental

⁶⁴ See e.g., PATENT POOLS AND OTHER CLEARING HOUSE MODELS, G. Vanderwolle ed. (Cambridge U. Press, forthcoming 2009). See also EPO Report

⁶⁵ [cites]

⁶⁶ See Reichman, *Free Riders to Fair Followers*, *supra* note ___, at 26-42.

⁶⁷ See Indian Patent Statute (2005), arts. 3(d), (e), (f); Kapczynski, *supra* note

⁶⁸ See esp. Kapczynski, *supra* note 1; Mueller, *supra* note

⁶⁹ See, e.g., Lulin Gao, *supra* note . However, due notice has been taken of *Bilski* in the U.S. *Id.*

⁷⁰ See *id.* (discussing pending arts. 23-24).

⁷¹ *Id.*, discussing pending art. 63.

⁷² *Id.*, discussing pending arts. 5, 27.

innovations to block local improvers in developing countries and to operated patent pools that could create formidable barriers to entry. Even the United States has recently begun to elevate its eligibility standards,⁷³ although not as steeply as those in India. Because governments cannot discriminate against foreigners,⁷⁴ however, high standards of eligibility must apply equally to local innovators. The latter, remain free to patent abroad, whatever the status of their inventions at home,⁷⁵ while “second tier” protection should be adopted to stimulate local investment in small-scale innovation.⁷⁶

In any event, the policy space for evaluating eligibility standards against local development needs would shrink drastically if such standards were harmonized by TRIPS-plus specifications under a Substantive Patent Law Treaty (SPLT).⁷⁷ This is one of the primary reasons developing countries should continue to resist such a harmonization exercise.

b. Problems on the Frontiers of Science

Another reason is that, even in developed countries, experts are not sure how to resolve problems affecting cutting-edge technologies,⁷⁸ which makes evaluation of the relevant issues even more difficult in developing countries. Recent studies of the seminal genomic discoveries carried out at Duke University, under an NIH grant, suggest a number of recurring problems on the frontiers of science that from time to time pose unresolved problems for the patent system.⁷⁹ These include:

- 1) Broad foundational patents that can block research and downstream applications, and that produce high transaction costs for would-be users.⁸⁰ For example, PCR and recombinant DNA were covered by a few patents, with a single owner (narrowly averted blocking effects).
- 2) An even bigger problem arises when basic research platforms are covered by multiple patents held by dispersed owners, public and private.
- 3) More generally, thickets of overlapping patents may cover a research platform or multiple components of an end product, especially in interdisciplinary research fields. For example, microarrays, or synthetic biology (life sciences, computer science, electrical engineering) and now even nanotechnology.⁸¹

⁷³ KSR; *Bilski*

⁷⁴ TRIPS Agreement, arts 3-4; Paris Convention, art. 2(1).

⁷⁵ TRIPS Agreement, art. 2,1; Paris Convention, art. _(bis).

⁷⁶ See further *infra*

⁷⁷ See Reichman & Cooper Dreyfuss, *supra* note

⁷⁸ See *id.*, at

⁷⁹ Jerome H. Reichman & Jennifer Giordano Coltart, *A Holist Approach to Patents Affecting Frontier Sciences: Lessons from the Seminal Genomic Discovery Studies*, paper presented at the CEER Retreat, Duke University Center for Genetics, Ethics and Law, April 2008; J. H. Reichman, paper presented to the EPO Patent Forum on Green Technology (Ljubljana, Slovenia, July 2008).

⁸⁰ See, e.g., Eisenberg (2008).

⁸¹ See, e.g., Rai & Sapna, *Synthetic Biology*.

- 4) In information technology, hundreds of patents on small contributions may yield patent thickets with vague boundaries, resulting in holdups and excessive litigation, a similar, if less dramatic process affects private sector-innovators in biotechnology.⁸²
- 5) Massing of patents for defensive purposes (especially in IT) may block entry to competitors and innovators.

All these problems—especially those of transaction costs—were then worsened by the proliferation of low quality patents, especially in the U.S.

Taken together, these and related problems could inhibit innovation and keep innovators in BRIC countries, among other developing countries, from realizing their full potential in biotechnology and information technologies. They increasingly deter private-sector researchers or investors in developed countries from exploring promising routes,⁸³ while placing universities in a delicate legal position as academics ignore patents when conducting cutting edge research.⁸⁴ Worse, they could hold Asia back in the race for innovative climate change technology, especially if future massive government funding replicates problems we now experience in biotech and IT.⁸⁵

Generally speaking, what we see here is the emergence of complex frontier sciences that require integrated management in their upstream dimension (and sometimes even in the applications domain). A holistic approach to intellectual infrastructure becomes essential.⁸⁶ But the patent system operates on an ad hoc, case-by-case reactionary basis that is not designed to address or govern such complex innovation systems. There results a risk of systemic conflict between the needs of a holistic science and innovation policy verses the methodology of traditional intellectual property laws.⁸⁷

(1) Some possible solutions

In principle, at least five primary measures, with varying degrees of nuance, can be envisioned to address these challenges.

- A broad research exemption for the experimental users of patented inventions to find new inventions, to invent around old ones, or to develop improvements;⁸⁸
- An administrative or judicial power to require that the invention be made available on a non-exclusive license;⁸⁹

⁸² See Rai, various studies; BESSEN & MEURER (negative aggregate gains of patents in this sector over costs); *Tsunami* article in Geertrui's book; Eisenberg (2008).

⁸³ See, e.g., French author in Geertrui's book; Eisenberg (2008).

⁸⁴ [cites]; Eisenberg (2008).

⁸⁵ See, e.g., Reichman, Rai, Newell & Wiener, *supra* note

⁸⁶ Cf. Brett Frischman, *Infrastructure*

⁸⁷ Reichman & Giordano Coltart, *supra* note

⁸⁸ EPC Convention; others

⁸⁹ EBay v. Merck

- An anti-blocking provision, normally in the form of a compulsory license for dependent patents, that allows improvers to avoid infringing a dominant patent;⁹⁰
- An “Essential Facility” Doctrine, familiar from competition law theory and practice, that would allow the pooling of overlapping patents within a platform technology;⁹¹
- Compulsory licensing, either for government (noncommercial) use or to enable third parties to supply the market in the public interest.⁹²

In practice, the availability of these solutions in developed countries varies from region to region and is always somewhat problematic. Yet, nothing in the multilateral conventions prevents developing countries from implementing these and other related provisions in their domestic laws.

United States patent law lacks a bona fide research exemption at the present time, and there is little chance that legislative reform will fill this gap.⁹³ The formal position in the E.U. is better,⁹⁴ but actual state practice seems to be narrowing the factual availability of this exception. Here is an obvious opportunity for “counter harmonization”⁹⁵ where developing countries should take the lead.

There is no anti-blocking provision in U.S. law,⁹⁶ and if a dominant patentee and an improver bargain to impasse, as occurs from time to time, the dominant patentee may keep a patented improvement off the market because its exercise would infringe the former’s patent.⁹⁷ While this result may suit a dominant patentee, because it defends him or her from a serious threat of competition, it lessens social welfare by depriving the public of the improved product,⁹⁸ unless the government intervenes with a public interest compulsory license.

Many European countries have accordingly codified compulsory licenses for dependent patents,⁹⁹ which are perfectly compatible with the TRIPS Agreement,¹⁰⁰ although European patent authorities had, until recently, been reluctant to grant them in practice. Anecdotal evidence suggests that the authorities in Europe may be more willing to grant such licenses now than in the past, and that, even in the past parties in Italy, Germany and the United Kingdom tended to bargain around the legal threat of such an anti-blocking measure, despite the fact that few such licenses were likely to be granted.¹⁰¹

⁹⁰ See TRIPS Agreement, *supra* note ____, art 31(1); GUSTAVO GHIDINI (2008).

⁹¹ See, e.g., HOVENKAMP, LEMLEY & JANIS. But see Trinto, __ U.S. __

⁹² See TRIPS Agreement, *supra* note ____, art. 31; Reichman with Hasenzahl, Non-Voluntary Licensing of Patented Inventions, Part I (ICTSD).

⁹³ *Madey v. Duke*

⁹⁴ EPC, art. ____.

⁹⁵ Kapczynski, *supra* note ____

⁹⁶ *Merges*, U. TENN. L. REV.

⁹⁷ GHIDINI, *supra* note

⁹⁸ *Id.*

⁹⁹ See, e.g., Reichman with Hasenzahl (2003)

¹⁰⁰ See *supra* note

¹⁰¹ Interviews with Professors Ghidini, Anderman, and Hanns Ullrich.

While China will include a dependant compulsory license in its pending patent reform,¹⁰² its availability in other developing countries is not widely reported. Here is an uncontroversial candidate for actual harmonization under TRIPS, rather than “counter harmonization,” that developing countries should wholeheartedly embrace.

Even in the absence of a patented improvement as such, the complexity of present-day inventions in which numerous overlapping patents may be combined, makes it advisable that courts have the power to deny permanent injunctions for infringement in the public interest and to allow compensation instead, preferably in the form of reasonable royalties.¹⁰³ This use of a liability rule, rather than a property rule, may be especially indicated when the parties are not in head-to-head competition, or when one or some of them do not actually work the patents they own, as cases following the Supreme Court’s *EBay* decision¹⁰⁴ in the U.S. have increasingly recognized.¹⁰⁵ Professor Kapczynski, among others, rightly commends this approach to the developing countries.¹⁰⁶

At higher levels of technological development, moreover, the advent of platform technologies, often affecting upstream research tools, may arise suddenly out of a convergence of formerly separate interdisciplinary pursuits, and they present formidable holdout problems that can adversely affect both basic research and downstream applications, as occurred in the case of microarrays.¹⁰⁷ If nothing is done, a dominant aggregator may sometimes solve the problem by means of vertical integration,¹⁰⁸ while leaving the progress of science in an uncertain state and possibly generating serious antitrust problems in the end.

To solve this problem, governments must have authority to override existing exclusive licenses and to grant nonexclusive licenses to additional or alternative parties in the public interest. For example, governments must be able to pool or bundle platform technologies into a technology trust¹⁰⁹ and make the platform available as a whole to downstream applications when the platform becomes an essential infrastructure for future research and innovation. In that case, all third parties who use the pooled technology should have to pay equitable compensation from their applications to the bundle or trust, for distribution to rights holders.¹¹⁰

In principle, competition law can reach a comparable result by means of an “essential facility” doctrine, which has sometimes been used in the E.U.¹¹¹ but remains in a semi-

¹⁰² See Lulin Gao, *supra*

¹⁰³ [cites]

¹⁰⁴ See *EBay v. Merck*.

¹⁰⁵ [cites]

¹⁰⁶ Kapczynski, *supra* note 7.

¹⁰⁷ See, e.g., Reichman & Giordano Coltart (2008); Rai

¹⁰⁸ See, e.g., Suzanne Scotchmer; Arti K. Rai

¹⁰⁹ See, e.g., Anthony So, *Technology Trusts*, paper presented to the Columbia University Conference.

¹¹⁰ Cf. Reichman, *Green Tulips*, *supra* note

¹¹¹ Microsoft case

moribund state under existing case law in the U.S.¹¹² Of course, a compulsory license for government use can always be invoked to address such a situation, without need to surmount the hurdles of competition law; and the U.S. has invoked government use licenses for similar purposes in the past.¹¹³ Both India and China have enacted or will enact comprehensive compulsory licensing schedules that clearly cover such a power.¹¹⁴

Nevertheless, developing countries with growing technological prowess should consider fashioning at least some guidelines, if not an actual codification, that would enable the authorities to intervene under an established “essential facilities” doctrine, in order to rescue a platform technology when circumstances so require, without necessarily resorting to competition law as such. Such intervention becomes particularly necessary when holdouts elevate the prices charged for use of the platform to the point where both research and applications risk becoming casualties of deadweight loss.

Notice that, with regard to compulsory licenses for government use, which are widely invoked in the U.S. for multiple purposes, especially national security,¹¹⁵ the TRIPS Agreement limits exports to 49.9% of production.¹¹⁶ So TRIPS had to be amended to allow back-to-back compulsory licenses enabling countries with capacity to manufacture medicines to supply poor countries that need access to generic drugs but lacked manufacturing capacity under compulsory licenses of their own.¹¹⁷ But there is a larger principle here of considerable importance. For example, countries may need to assist each other with access to essential climate change technologies, and pooled procurement strategies may become advisable.¹¹⁸ So this concept of back-to-back compulsory licenses for inputs of essential technology may need to be broadened, and NGOs concerned about access to green technologies have already commissioned studies of this topic.¹¹⁹

(2) Checks and Balances in the Public Funding of Research

The most technologically advanced developing countries should also formulate their own approach to regulating the patenting of government-funded research results, particularly those obtained by universities and other public research centers. While the benefits of the U.S. Bayh-Dole Act are well advertised, the unresolved problems it creates are also increasingly well documented, as are a growing list of needed reforms, which will be hard to enact in the U.S.¹²⁰

¹¹² Trinko, __U.S. __

¹¹³ [cites]; Reichman with Hasenzahl

¹¹⁴ See, e.g., Kapczynski, *supra* note 1; Lulin Gao, *supra* note __

¹¹⁵ Reichman with Hasenzahl (2003)

¹¹⁶ TRIPS Agreement, *supra* note __, art. 31(f).

¹¹⁷ See Frederick M. Abbott & Jerome H. Reichman, *The Doha Round’s Public Health Legacy: Strategies for the Production and Diffusion of Patented Medicines under the Amended TRIPS Provisions*, 10 J. INT’L ECON. L. 921 (2007) (citing authorities).

¹¹⁸ *Cf. id.*, at

¹¹⁹ See, e.g., *supra* note __ (Chatham House Paper); Frederick M. Abbott (ICTSD study).

¹²⁰ Rai & Eisenberg (2003)

Recently, seven American experts published a detailed list of concerns about the effects of the Bayh-Dole Act in the U.S.,¹²¹ and they recommended the following minimum safeguards in the public interest:

- 1) Publicly funded university research results should not be exclusively licensed, unless it is very clear that an exclusive license is essential for commercialization. For example, many research tools can be used off the shelf without further downstream R&D, as was the case with the Cohen-Boyer patents in DNA sequencing.¹²²
- 2) The legislation should ensure transparency in the patenting and licensing of publicly funded research results.¹²³
- 3) Where licensing arrangements for publicly funded research do not achieve public interest objectives, governmental authorities must have power to override such licenses and to grant licenses to additional or alternative parties.¹²⁴
- 4) The government should retain an automatic right to use any invention arising from its funding.¹²⁵
- 5) Besides promoting commercialization the government must ensure consumer access to end products.¹²⁶
- 6) Governments should not presume that patenting or exclusive licenses are the best options, but may instead “focus on placing by default or by strategy, government-funded inventions into the public domain, creating a scientific commons, enabling collective management of intellectual property, or fostering open source innovation.”¹²⁷
- 7) Where greater commercial incentives seem necessary, “the benefits of nonexclusive licenses should always be weighed against the social cost of exclusive licenses.”¹²⁸

In other words, instead of simply imitating the U.S. model as it stands, the developing countries should take the lead in formulating improved versions of the Bayh-Dole principle, which would better address the need to ensure access to research tools for the research community and that would also address questions of abusive pricing of products whose R&D costs were essentially borne by taxpayers in the first instance. At the same time, developing countries need to devise their own public-private initiatives to endow

¹²¹ So et al, *supra* note

¹²² *Id.*, at 2081

¹²³ *Id.*

¹²⁴ *Id.*

¹²⁵ *Id.*

¹²⁶ *Id.*, at 2081-82.

¹²⁷ *Id.*, at 2082.

¹²⁸ *Id.*

venture capital funds (and, perhaps related research prize contests¹²⁹) that could improve upon even the successful models currently deployed in some OECD countries.

Unfortunately, India's rapid enactment of a Bayh-Dole-like statute without due regard to these safeguards¹³⁰ does not bode well for the future in this respect. Similar statutes are under consideration in numerous other countries, including South Africa,¹³¹ and it remains to be seen whether greater caution will be exercised than was the case in India.

(3) Smarter Use of Second Tier Regimes

While it seems clear that the developing countries as a whole should maintain relatively pro-competitive markets for innovation vis-à-vis the high protectionist regimes in the U.S. and the E.U., this does not require the former countries to sacrifice their own domestic innovators to free-riding appropriators. Rather the developing countries need to outsmart the high-protectionists by fashioning intellectual property regimes that match their own needs and capacities without violating international IP norms.¹³² In particular, they could take the lead in making sensible uses of liability rules to stimulate rapid exchanges of cumulative and sequential innovation, especially for purposes of follow-on innovation, while reserving strong exclusive rights for a relatively restricted class of truly path breaking inventions.

Today, as previously discussed, there are many ways to achieve this different kind of balance. For example, by enacting and implementing compulsory licenses for dependent improvements;¹³³ by limiting injunctions to cases that demonstrably serve the public interest, now once again a characteristic of United States law and practice;¹³⁴ or by developing an *ex ante* regime of compensatory liability rules that I have elsewhere described.¹³⁵

(4) Incentives for Promoting Public Health, the Environment, and Collaborative Research

Developing countries should take the lead in revamping increasingly obsolete approaches to the use of IPRs in the field of medicine. In no other area is there a greater need for innovative approaches, and there is an ever growing list of potential tools that could be used to increase research outputs and to achieve better distributional outcomes as well. These include:

¹²⁹ See, e.g., Love & Hubbard, *The Big Idea*; see also Pogge.

¹³⁰ Cites

¹³¹ Cites.

¹³² Accord: Kapczynski, *supra* note 1.

¹³³ See *supra* notes ___ and accompanying text.

¹³⁴ See *supra* notes ___ and accompanying text.

¹³⁵ See Reichman, *Green Tulips*, *supra* note ___; Reichman & Lewis, *Using Liability Rules to Stimulate Innovation in Developing Countries: Application to Traditional Knowledge*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note ___, ch. 13.

- Proposals for pre-competitive pooling of privately owned small molecule libraries, with a view to facilitating the upstream identification of promising target molecules through university-generated assay designs;¹³⁶
- Proposals for public-private technology pools that would undo patent thickets and stimulate investment, while preserving revenues from downstream applications for single depositors;¹³⁷
- Proposals for government funding of clinical trial studies, with corresponding buy-ins at the international level and release of results to the worldwide scientific community.¹³⁸
- Proposals for buy-outs and humanitarian licensing,¹³⁹ as well as for pooled procurement strategies under the Amended TRIPS provisions, with a view to encouraging the distribution of essential medicines on a “high-volume, low-margin” marketing strategy.¹⁴⁰
- Proposals for prizes and other novel research inducements that would help to separate the research and marketing functions in the medical sector.¹⁴¹

Were the leading developing countries to pursue their own pro-active policies in this area, precisely at a time when their medical research capacity is growing, it could lead to novel and perhaps breakthrough solutions of benefit to the rest of the world.

Another area ripe for potential developing country leadership is that of “green technologies.” Here some recent studies suggest that IPRs have so far been playing an appropriately stimulatory role, and that the problems elsewhere observed in regard to information technology and biotechnology have not yet seriously appeared in this sector,¹⁴² perhaps because it is still at an incipient stage, with many small players and without large-scale capital investments. Precisely because emerging economies could participate on the ground floor of future developments in environmental technologies, it behooves their governments to devise collaborative strategies in a way to foster

¹³⁶ See Arti K. Rai, Jerome H. Reichman, Paul F. Uhler & Colin Crossman, *Pathways Across the Valley of Death: Novel Intellectual Property Strategies for Accelerated Drug Discovery*, 8 YALE J. HEALTH, POLICY, LAW AND ETHICS 2 (2008).

¹³⁷ See, e.g., Anthony So; Duke Conference; SARS initiative; Dindi initiative; Roy Widdus, *Product Development Partnerships on ‘Neglected Diseases’: Intellectual Property and Improving Access to Pharmaceuticals for HIV/AIDS, Tuberculosis and Malaria*, in NEGOTIATING HEALTH—INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES 205-27 (P. Roffe, G. Tansey & D. Vivas-Engui eds., Earthscan, 2006) [hereinafter NEGOTIATING HEALTH].

¹³⁸ See Tracy R. Lewis, Jerome H. Reichman, & Anthony So, *The Case for Public Funding and Public Oversight of Clinical Trials*, ECONOMISTS’ VOICE, www.bepress.com/ev (Jan 2007); Jerome H. Reichman, *Rethinking the Role of Clinical Trial Data: The Case for a Public Goods Approach*, 13 MARQUETTE INTELL. PROP. L. REV. 1 (2009).

¹³⁹ K. Outserson I & II; Kapczynski & ; James Love, *Four Practical Measures to Enhance Access to Medical Technologies*, in NEGOTIATING HEALTH, *supra* note , 241-56.

¹⁴⁰ Abbott & Reichman, *supra* note 9

¹⁴¹ James Love, *supra* note .

¹⁴² See, e.g., John Barton I & II.

maximum growth and participation, without the impediments that excessive protection have caused in other sectors.¹⁴³

Looking beyond these individual sectors, there is growing interest in new ways to develop the so-called “sharing economy,” which has produced such successes as the open-source operating system and the Wikipedia.¹⁴⁴ Considerable efforts are also underway to devise new forms of scientific cooperation that could cut through legal, technical and economic barriers to the Mertonian sharing ethos, could help to establish worldwide scientific networks and commons on an unprecedented scale, and extend “open source” methodologies to new areas of study.¹⁴⁵ Here, again, developing countries should be at the center of these initiatives, and not on the sidelines waiting for others to succeed.

2. Measures Concerning Copyrights and Neighboring Rights

Another area badly in need of innovative solutions is the quest for sensible laws and policies to implement exceptions to, and limitations on, intellectual property rights otherwise governed by the TRIPS Agreement and the under-theorized “three-step tests” it generated.¹⁴⁶ Here major efforts are underway in both academic and government circles to rethink the question of exceptions and limitations from a more public interest perspective than was possible in the immediate aftermath of TRIPS.¹⁴⁷

[Material to be developed from Reichman and Okediji, *Empowering Digitally Integrated Scientific Research: The Pivotal Role of Copyright Law’s Exceptions and Limitations* (2009). Will discuss:

- 1) Broad exception for scientific research
- 2) Worldwide fair use privileges (adjusted for hard cases)
- 3) Broad exemptions for teaching and libraries
- 4) Compulsory license for bulk purchase of educational materials
- 5) Max Planck and Queen Mary’s Declaration on the Three Step Test
- 6) Unlocking the digital locks
- 7) Aligning existing database protection laws with the reforms of copyright law (treated above).
- 8) Avoiding database protection laws in FTA negotiations.]

¹⁴³ See Chatham House EU-China Project in this regard; ICTSD initiatives.

¹⁴⁴ See, e.g., James Boyle (book); BENKLER, WEALTH OF NETWORKS; Rai article.

¹⁴⁵ See *supra* note . See also Jerome H. Reichman, Paul F. Uhlir & Tom Daederwerdere, *Designing the Microbial Commons*; Peter Lee; Jonathan Barnet, *Sharing in the Shadow of Property: Rational Cooperation in Innovation Markets* (2009); Frischmann, Strandburg, et al (2009).

¹⁴⁶ See TRIPS Agreement, *supra* note 13; Max Planck & Queen Mary Declaration on Three-Step Test.

¹⁴⁷ See, e.g. Hugenholtz & Okediji; Kur & Levine; Max Planck Initiative; see also Rochelle Cooper Dreyfuss, *Should Users Strike Back?*; Jerome H. Reichman, Graeme B. Dinwoodie & Pamela Samuelson, *A Reverse Notice and Takedown Regime to Enable Public Interest Uses of Technically Protected Copyrighted Work*, 22 BERKELEY TECH. L.J. 981 (2007); Proposed Access to Knowledge Treaty.

As these proposals emerge to light, it behooves the developing countries—both at the domestic and regional levels—to play a leadership role in vetting and experimenting with them, especially with a view to benefiting their own research and educational communities. In other words, these countries should evaluate the extent to which their own needs for access to knowledge should lead them to support WIPO Development goals consonant with those needs, in opposition to the high-protectionist policies favored by what I have elsewhere deemed a “knowledge cartel.”¹⁴⁸ Bold legislative initiatives in domestic laws on these matters could help set and define the international IP agenda for the next several decades.

3. Measures Concerning Competition Law and Misuse

[To be developed]

Finally, there is universal recognition of the need to redefine the border between intellectual property rights and competition law in a manner conducive to promoting worldwide markets for technology.¹⁴⁹ Here the high and middle-income developing countries need to formulate competition law rules and policies (hopefully coordinated) to ensure that foreign technologies and know-how flow to local markets under reasonable terms and conditions and at prices local entrepreneurs can afford.¹⁵⁰ In so doing, they should fully exploit the competition law exceptions available under the TRIPS Agreement,¹⁵¹ and they should draw upon solutions and proposals emanating from both past and present practices all over the world, given the political will and skill to do so.

That both India and China have begun to formulate law and policy in this area may serve to stimulate other countries that have so far played virtually no formative role in this area at all.

IV. Obstacles to Implementation of “Counter-Harmonization Initiatives

Discussion of problems and obstacles to implementation of TRIPS-consistent flexibilities raised by Carolyn Deere’s *The Implementation Game* and by Amy Kapczynski’s *Harmonization and Its Limits*.

¹⁴⁸ See Maskus & Reichman, *supra* note ____.

¹⁴⁹ See, e.g., Josef Drexler, *The Critical Role of Competition Law in Preserving Public Goods in Conflict with Intellectual Property Rights*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 709-25; Eleanor Fox, *Can Antitrust Policy Protect the Global Commons from the Excesses of IPRs?*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 758-79.

¹⁵⁰ J. H. Reichman, *Nurturing a Transnational System of Innovation*, 16 J. TRANSNAT. L. & P. 143, 161 (2007).

¹⁵¹ See, e.g., Hanns Ullrich, *Expansionist Intellectual Property Protection and Reductionist Competition Rules: A TRIPS Perspective*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note, 720-57; Mark D. Janis, “Minimal” Standards for Patent-Related Antitrust Law under TRIPS, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 774-92; Shubha Ghosh, *Competitive Baselines for Intellectual Property*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 793-814.

Particular attention will be paid to the failure of UNDP to support early proposals to strengthen interagency review in developing countries and to the need to defend against illicit retaliations. See, for example, Jerome H. Reichman, *Compulsory Licensing of Patented Pharmaceuticals: Evaluating the Options*, 27 J. LAW, MED. & ETHICS (symposium issue, forthcoming 2009).

V. Concluding Observations

Much of the recent literature has addressed two fundamental tenets of the high-protectionist rhetoric, namely that stronger IPRs necessarily lead to more innovation¹⁵² and that they are essential for attracting FDI.¹⁵³ Studies by the Federal Trade Commission, the National Academy of Sciences, and leading economists have increasingly confirmed the diminishing returns that an unbalanced patent system has been producing in the United States, and the resulting pressures for reform have resulted in major Supreme Court decisions as well as far-reaching legislative proposals pending before Congress.

Other studies have demonstrated that technology exporters need access to Asian and Latin American markets as much as these countries need FDI, licensing and up to date high-tech goods.¹⁵⁴ So long as the general level of IP protection affords technology exporters the minimum standards and entrepreneurial options available under the TRIPS Agreement, these exporters will find ways to reach attractive markets, and would-be purchasers in developing countries can usually meet their needs through sound procurement strategies. Specific bottlenecks are more likely to arise from refusals to deal and other restrictive business practices that suitable competition laws and policies could help to resolve than from gaps or inadequacies in local intellectual property laws, although the weak enforcement of IP laws may still have detrimental affects.¹⁵⁵ Meanwhile, innovative firms operating in a pro-competitive environment at home can always profit from high-protectionist IP regimes abroad—under the independence of patents doctrine¹⁵⁶—without aping the protectionist excesses of those regimes.

As Maskus has explained, IP regimes are but one component of a healthy development-oriented economy. Without an appropriate infrastructure that includes corporate law, bankruptcy law, and a solid educational system, among other variables, IP protection may add little to either FDI or economic growth in its own right.¹⁵⁷ Moreover, as the relations between IPRs and innovation in knowledge economies become better understood, the proper role of innovation as such in overall development policies remains far less clear

¹⁵² See supra notes and accompanying text.

¹⁵³ See, e.g., Gervais, supra note ; Yu, supra note (citing authorities).

¹⁵⁴ See Yu, supra note ; Dan Chow, .

¹⁵⁵ See *id.*, at

¹⁵⁶ See Paris Convention for the Protection of Industrial Policy (1883), revised at Stockholm (1967), art. 4bis.

¹⁵⁷ Keith E. Maskus, *Intellectual Property Rights in the Global Economy* (Institute for Int'l Economics 2000)

and more complex than the IP literature normally recognizes.¹⁵⁸ Unless countries actively seek to maximize the benefits and minimize the social costs of the TRIPS harmonization standards,¹⁵⁹ there is a risk that they may end up “financing not just or even primarily their own growth, but promoting the economic growth of developed countries, possibly to the detriment of their own economic development.”¹⁶⁰

Against this background, I contend that many high and middle-income developing countries, as a group, are well-positioned to undertake a leadership role in adapting traditional intellectual property law to the new technological conditions and challenges that the OECD countries have failed to solve. To the extent that these countries avoid the pitfalls that have begun to undermine markets for technology in the U.S. and EU, fashioning a more flexible, balanced and modern approach could in fact enable them to boost their growing comparative advantages in cutting-edge technologies well beyond current levels. To achieve this result, however, will require developing country governments to self-consciously adopt disciplined legal and political strategies that preserve the policy space in which to devise and test their own intellectual property institutions.¹⁶¹

For example, legal circles in all the emerging economies will have to study and master the relevant WTO jurisprudence, as the Japanese have done,¹⁶² in order to steer clear of obvious legal obstacles and defend national autonomy at the TRIPS Council and, when necessary, in actual dispute-settlement cases. These countries should also avoid further multilateral and bilateral standard-setting negotiations that can only limit their own autonomy and governance capacities, while at the same time seeking to forge regional understandings on these same issues that could attenuate the pressures from abroad.¹⁶³ Developing countries would also be well advised to establish solid interagency review boards that can exercise oversight of their intellectual property bureaus and ensure that the latter properly implement national innovation policies established at the highest levels of government.¹⁶⁴

Any uniquely developing country effort to fashion appropriate intellectual property regimes for the twenty-first century will have to focus on finding a new equilibrium between public and private goods. Because the last half of the twentieth century was so consumed with tensions between public-centered and private-centered economies, insufficient thought has been given to operationalizing the proper and ever-evolving interrelationship between private and public goods, which the rise of knowledge economies has made so critically important.¹⁶⁵ In this context, Joseph Stiglitz’ call to

¹⁵⁸ See, e.g., Margaret Chon, *Substantive Inequality in International Intellectual Property Norm Setting and Interpretation, in IP, Trade and Development*, *supra* note , 475-526. See also Joseph Stiglitz.

¹⁵⁹ See Reichman, *From Free Riders to Fair Followers*, *supra*

¹⁶⁰ Robert L. Ostergard Jr., *supra* note at

¹⁶¹ See generally Reichman & Cooper Dreyfuss, *supra* note

¹⁶² Remarks by [Visiting Professor from Japan] Duke Law School

¹⁶³ See Maskus & Reichman, *supra* note ; Reichman & Cooper Dreyfuss, *supra* note

¹⁶⁴ See Jerome H. Reichman, Bellagio talk. See also Rai

¹⁶⁵ See Maskus & Reichman, *supra* note . See generally Peter Drahos, *The Regulation of Public Goods, in INTERNATIONAL PUBLIC GOODS AND IP*, *supra* note , 46-64.

recognize the role of “knowledge as a global public good”¹⁶⁶ has generated an important literature whose practical implementation should become a primary goal of forward looking policy in all developing countries.¹⁶⁷

In this connection, these countries should build ever stronger connections to the worldwide flow of scientific and technical information, a task that will require sharing locally generated scientific data with the rest of the world (as China has begun to do),¹⁶⁸ while resisting legal, economic and technological restraints on the dissemination of such data.¹⁶⁹ A particularly forward looking policy would, for example, lead these countries to support open source and other sharing mechanisms at the level of scientific enquiry,¹⁷⁰ while taking steps to better ensure downstream support for innovative applications flowing from cooperative public-private upstream research initiatives.

If, at the end of the twentieth century, we learned that access to knowledge was as important for economic growth and human welfare as stimulating investment in the production of knowledge goods, it could be the developing countries as a group that lead us out of certain blind alleys that currently pit these two essential policy goals against one another. It is, as Professor Cooper Dreyfuss and I have recently argued, precisely a time for experimentation, and not a time to copy or codify obsolete approaches that are likely to boomerang against the long-term interests of the very developed countries that are most avidly pushing the harmonization buttons at the international level.¹⁷¹

To be sure, charting one’s own course is never easy, especially when powerful countries and a knowledge cartel apply countervailing pressures at every step. Nevertheless, I continue to believe that, with enlightened leadership, buttressed by “skillful lawyering, political determination and coordinated planning,”¹⁷² the IP system inherited from the Industrial Revolution¹⁷³ can be transformed into a worldwide system of innovation that will benefit countries at every stage of economic development.

¹⁶⁶ Joseph Stiglitz, *Knowledge as a Global Public Good*, in

¹⁶⁷ See also UNESCO, TOWARD A KNOWLEDGE SOCIETY.

¹⁶⁸ See, e.g., NAS Publication re cooperation with China

¹⁶⁹ See *supra* notes and accompanying text

¹⁷⁰ See Yochai Benkler; James Boyle; Science Commons.

¹⁷¹ Reichman & Cooper Dreyfuss, *supra*

¹⁷² Abbott & Reichman *supra* at

¹⁷³ See SUSAN SELLS & CHRISTOPHER MAY, CRITICAL HISTORY OF INTELLECTUAL PROPERTY,