

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*

A. Introduction: Emerging Role of the BRIC Countries

The exact connection between intellectual property and economic development varies over time from country to country and region to region.¹ 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 one digs deeper, one discovers that, until 1982, the United States had one of the developed 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 an aggressively interventionist competition law along with a robust doctrine of patent misuse.² 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.³ 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

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¹ See, e.g., Meier Pugatch (2009); see generally KEITH MASKUS, *INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY*, (IIE, 2000).

² See, e.g., 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, 20-21 (citing authorities) (K.E. Maskus & J.H. Reichman eds., 2005) [hereinafter *INTERNATIONAL PUBLIC GOODS AND IP*]; H. J. Hovenkamp, *The Intellectual Property Antitrust Interface*, University of Iowa College of Law, Legal Studies Research Paper No. 08-46 (2008).

³ See, e.g., Rochelle C. Dreyfuss, *The Role of India, China, Brazil and Other Emerging Economies in Establishing Access Norms for Intellectual Property and Intellectual Property Lawmaking*, NYU Institute for International Law and Justice (IJIL), Working Paper 2009/5 (draft version July 30, 2009) [hereinafter R. C. Dreyfuss, *Role of Emerging Economies*].

products as such.⁴ This phenomenon 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.⁵

At the same time, we may confidently agree that, countries such as Russia, China, India, Brazil, Korea, Malaysia, Indonesia, Argentina, South Africa, and many other emerging economies, will not reach their full economic potential without adequate intellectual property regimes.⁶ For example, policymakers in most Asian countries that are already committed to becoming players in the knowledge economy,⁷ clearly understand they 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.⁸

The moment one looks at Asia, as a regional group, from this perspective, one is struck by how the much 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 1994.⁹ As many critical thinkers have written, the TRIPS Agreement produced a regime that deliberately favored those OECD countries that already possessed developed national systems of innovation and whose multinational companies owned plenty of patented high-tech products to sell or manufacture around the world.¹⁰ There was a built-in disposition to favor big companies seeking rents from existing innovations—or those in the pipeline—

⁴ See, e.g., Amy Kapczynski, *Harmonization and Its Limits: A Case Study of TRIPS Implementation in India's Pharmaceutical Sector* (Draft 2009).

⁵ See, e.g., Maskus, *supra* note 1.

⁶ See, e.g., Daniel Gervais, *Of Clusters and Assumptions: Innovation as Part of a Full TRIPS Implementation*, 97 *FORDHAM L. REV.* 2353 (2009); R.C. Dreyfuss, *Role of Emerging Economies*, *supra* note __.

⁷ See generally, UNESCO, *TOWARDS A KNOWLEDGE ECONOMY* (2008)

⁸ 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.

⁹ Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299; 33 I.L.M. 1197 (1994) [hereinafter *TRIPS Agreement*]. See Jerome H. Reichman, *Universal Minimum Standards of Intellectual Property Protection under the TRIPS Component of the WTO Agreement*, in *INTELLECTUAL PROPERTY AND INTERNATIONAL TRADE – THE TRIPS AGREEMENT* (Carlos M. Correa & Afdulqawi A. Yusuf eds., Rev. Ed. 2008).

¹⁰ See, e.g., See, e.g., CHRISTOPHER MAY & SUSAN SELL, *INTELLECTUAL PROPERTY RIGHTS: A CRITICAL HISTORY* (Lynne Rienner Publishers, 2005); D. GERVAIS, *supra* note 6, at 2357-58.

at the cost of making future innovations more difficult, especially for less technically advanced countries.¹¹

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.¹²

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 payment advantages over time.¹³ As more 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 had established, as well as from location and other endowment factors,¹⁴ 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,¹⁵ 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.¹⁶ What this article will focus on, instead, is how the developing

¹¹ See, e.g., DRAHOS & BRATHWAITE, INFORMATION FEUDALISM: WHO OWNS THE KNOWLEDGE ECONOMY?, (Earthscan, 200_); Jerome H. Reichman & Rochelle Cooper Dreyfus, *Harmonization Without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L. J. 85 (2007).

¹² Robert L. Ostergard, Jr., *Economic Growth and Intellectual Property Protection: A Reassessment of the Conventional Wisdom*, in IP, TRADE AND DEVELOPMENT, *supra* note 1, 115, 155.

¹³ J.H. Reichman, *Intellectual Property in International Trade: Opportunities and Risks of a GATT Connection*, 22 VAND. J. TRANSNAT’L L. 747, 891 (1989). For evidence that this inversion is occurring within the Indian pharmaceutical industry, see Kapczynski, *supra* note 4.

¹⁴ See esp. Yu, *supra* note __

¹⁵ See Maskus & Reichman, *supra* note 2; see also Jerome H. Reichman, *Richard Lillich Memorial Lecture: Nurturing a Transnational System of Innovation*, 16 J. TRANSNAT. L. & POL. 143 (2007).

¹⁶ See, e.g., Maskus and Fink, *Intellectual Property and Development: Lessons from Recent Economic Research*, The International Bank for Reconstruction and Development/The World Bank, Washington, 2005.

countries with growing technological prowess should best seek to accommodate their own national systems of innovation¹⁷ to the worldwide intellectual property system emerging in the post-TRIPS period, with a view to maximizing global economic welfare in the foreseeable future.

B. Avoiding Protectionist Excesses

High-protectionist visions of intellectual property law have become a kind of latter day religion promoted by the special interests that have long dominated the political scene in the U.S., EU and Japan.¹⁸ The BRIC countries in particular will thus need to inoculate themselves against succumbing to these same high-protectionist illusions while there is still time. If it is true, that a country cannot play in the knowledge economy without IPRs,¹⁹ 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.²⁰ Such regimes also enable large corporations that are sometimes slothful innovators to accumulate pools of cross-licensed patents that create barriers to entry for the truly innovative small and medium-sized firms.²¹

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 weak 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.²² There is still no consensus about how to reform the patent 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.²³ For these and

¹⁷ See also Gervais, *supra* note 6, at 2361-2371 (emphasizing adaptation problems of national systems of innovation and citing authorities).

¹⁸ See, e.g., MICHAEL RYAN, BOOK; DRAHOS & BRAITHWAITE, *supra* note 11 (citing authorities). *But see* EUROPEAN PATENT OFFICE, SCENARIOS FOR THE FUTURE (2007) [hereinafter EPO SCENARIO] (evaluating four competing scenarios for the evolution of IP regimes with very different and conflicting premises and outcomes).

¹⁹ See Gervais, *supra* note 8.

²⁰ See *infra* note 22; JAMES BOYLE, THE PUBLIC DOMAIN (2009); Reichman and Cooper Dreyfuss, *supra* note 11, 85, 102-08.. 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).

²¹ Carl Shapiro, *Navigating the Patent Thicket: Cross Licenses, Patent Pools, and Standard Setting*, in INNOVATION POLICY AND THE ECONOMY (Jaffe, Lerner & Stern eds., MIT Press 2006). Properly designed IPRs do, however, protect innovative small and medium-sized firms from the predatory practices of their larger competitors.

²² See BESSEN & MEURER, PATENT FAILURE: HOW JUDGES, BUREAUCRATS, AND LAWYERS PUT INNOVATORS AT RISK (2008); JAFFE & LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS, AND WHAT TO DO ABOUT IT (2004); HELLER, THE GRIDLOCK ECONOMY: HOW TOO MUCH OWNERSHIP WRECKS MARKETS, STOPS INNOVATION, AND COSTS LIVES (2008). Studies by the Federal Trade Commission and the National Academy of Sciences have also confirmed the diminishing returns that an unbalanced patent system has been producing in the United States.

²³ Reichman & Cooper Dreyfuss, *supra* note 11.

other reasons, the European Patent Office has expressed concerns about the uncertain future of the world patent system.²⁴

None of these domestic tensions deterred either USTR or the European Commission (EC) from demanding that the rest of the world should adopt a proposed Substantive Patent Law Treaty²⁵ that, at the international level, would have locked 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.²⁶ 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 asking the other OECD countries, please give us all your insoluble problems and contradictions as soon as possible, so we can undermine our own national systems of innovation, too.²⁷

Of course, the more that high and middle-income developing countries become players in the knowledge economy, the more they share some of the fears and risks that usually underlie demands 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.²⁸ They also want to maintain inward flows of FDI and market-driven technology transfer into their own countries, in order to bolster their growing technological capacities.

Yet, such concerns do not necessarily add up to a compelling case for higher levels of international intellectual property protection. On the contrary, the TRIPS Agreement itself provided an unprecedented platform of IP protection for exports after 2000,²⁹ and

²⁴ See EPO SCENARIOS, *supra* note 12.

²⁵ See, e.g., World Intellectual Property Organization (WIPO), Standing Comm. On the Law of Patents, Report, at 1-2, WIPO Doc. SCP/10/11 (June 1, 2005); WIPO, Standing Comm. On the Law of Patents, Information on Certain Recent Developments in Relation to the Draft Substantive Patent Law Treaty (SPLT), at 2-3, WIPO Doc. SCP/10/8 (Mar. 17, 2004).

²⁶ See, e.g., EBay Inc. v. MercExchange, LLC., 547 U.S. 388 (2006); MedImmune, Inc., v. Genetech, 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), cert. granted ____ U.S. ____ (2009).

²⁷ 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; THE TRIPS AGREEMENT AND THE GLOBAL POLITICS OF INTELLECTUAL PROPERTY REFORM IN DEVELOPING COUNTRIES (Oxford University Press, 2009).

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²⁹ 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 (TRIPS 66.1) and for pharmaceuticals, until 2016 (Doha Declaration on the TRIPS Agreement and Public Health). See TRIPS Agreement, *supra* note 9, art. 66.1; Extension of the Transition Period under Article 66.1 for Least Developed Country Members, Decision of the Council for TRIPS of 19 November 2005, WTO doc. IP/C/40, November 30, 2005. Extension of the Transition Period under Article 66.1 of the TRIPS

there is little evidence that this is insufficient for the needs of Asian exporters, or those of other emerging economies for the foreseeable future. Meanwhile, the relation between FDI and IPRs itself remains ambiguous, given that OECD technology exporters need entry into emerging economies as much as these economies need FDI and market-driven technology transfer from the OECD countries.³⁰

In China, India, and Brazil, moreover, knowledge economy skills and capacities have apparently reached the point where the stimulating effects of IPRs will 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.³¹ Increasingly, tensions arise 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.³² 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.³³

A parallel set of problems that the BRIC countries and other emerging economies 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 most of these countries. Yet, international intellectual property rights throw up roadblocks to the acquisition of needed scientific³⁴ and educational materials,³⁵ essential medicines,³⁶ and both seeds,

Agreement for Least Developed Country Members for Certain Obligations with Respect to Pharmaceutical Products, Decision of the Council for TRIPS of 27 June 2002, WTO doc. IP/C/25, July 1, 2002.

³⁰ See Yu, *supra* note 8.

³¹ See, e.g., *id.*; Kapczynski, *supra* note 4 (with regard to pharmaceuticals in India). See also Pedro Nicoletti Mizukami & Rolando Lemos, *From Free Software to Free Culture: The Emergence of Open Business*, in ACCESS TO KNOWLEDGE IN BRAZIL: NEW RESEARCH ON INTELLECTUAL PROPERTY, INNOVATION AND DEVELOPMENT, 25-59 (2008) (regarding software in Brazil).

³² See, e.g., Kapczynski, *supra* note 4; Janice Mueller, *The Tiger Awakens*, 68 U.PITT.L.REV. (2007)

³³ See, e.g., Reichman & Cooper Dreyfus, *supra* note 11.

³⁴ See, e.g., JAMES BOYLE, *THE PUBLIC DOMAIN: ENCLOSING THE COMMONS OF THE MIND* (Yale Univ. Press, 2008); Jerome H. Reichman, & Ruth L. Okediji, *Empowering Digitally Integrated Scientific Research: The Pivotal Role of Copyright Law's Limitations and Exceptions*, Paper presented at the Fordham Conference on Intellectual Property Law and Policy, Cambridge University, Cambridge, U.S., April 15, 2009); to the UNCTAD/ICTSD Side Event Meeting of the Standing Committee on Copyrights and Neighbouring Rights, World Intellectual Property Organization, Geneva, Switzerland, May 29, 2009; and to the Meeting of the Task Force on Intellectual Property Rights and Development (IDP), University of Manchester, Manchester, U.K., June 22-23, 2009 (Draft version, May 4, 2009); J.H. Reichman & Paul F. Uhler, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 77 L. & CONTEMP. PROBS. 315 (2003).

³⁵ Ruth L. Okediji, *Sustainable Access to Copyrighted Digital Information Works in Developing Countries*, in *International Public Goods and IP*, in *International Public Goods and Transfer of Technology Under a Globalized Intellectual Property Regime*, Maskus & Reichman, eds, Cambridge University Press (2005), at 142; Margaret Chon, *Intellectual Property from Below: Copyright and Capability for Education*, 40 UC Davis Law Review (2007).

³⁶ 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).

stocks, and fertilizers needed for economic growth.³⁷ The extent to which these same types of impediments will adversely affect the development and dissemination of environmental technologies remains to be seen.³⁸

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 needed to ensure an appropriate social return from publicly funded or publicly generated research initiatives.³⁹

C. 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. They must make many policy decisions affecting the growth of a knowledge economy, rather than an economy based on physical, capital or natural resources, that have relatively little to do with intellectual property laws as such.⁴⁰ To the extent that intellectual property laws do play an ancillary but important role, there are – roughly speaking – 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).⁴¹ The other approach is to embark upon a more innovative and even experimental path, with a view to addressing

³⁷ 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 27, 188; Timothy Swanson & Timu Goeschl, *Diffusion and Distribution: The Impact on Poor Countries of Technological Enforcement within the Biotechnology Sector*, in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 27, 669. See also Michael Halewood, *Agriculture and the Global Crop Commons*, paper presented at the Task Force on Intellectual Property Rights and Development, Manchester, UK, June 2009.

³⁸ 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, *Innovation and Technology Transfer to Address Climate Change: Lessons from the Public Debate on Intellectual Property and Public Health*, ICTSD Issue Paper No. 24 (2009); Keith Maskus & Ruth Okediji, *Economic and Legal Considerations for the International Transfer of Environmentally Sound Technologies* ICTSD (2009).

³⁹ 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).

⁴⁰ See, e.g., Gervais, *supra* note 6, at 2361-71 (discussing strategies for research and education for the clustering or networking of centers of innovation, for steering innovation in suitable directions, for inculcating social norms conducive to innovation, and for a suitable regulatory infrastructure).

⁴¹ See, e.g., Gervais, *supra* note 6; Gervais, *Epilogue—TRIPS: An Implementation Toolbox*, in INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT, *supra* note 8, at 527-46. See also CAROLYN DEERE, *supra* note 20. 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).

and perhaps solving the very problems that the advanced technology exporting countries currently find so daunting.⁴²

A. From “Fair Followers” to “Counter Harmonization”⁴³

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 think⁴⁴); it may reduce internal debate about appropriate solutions; and it may deflect political and economic pressures from powerful countries whose own prior practices cast a comforting shadow.⁴⁵

While this strategy seems politically expedient, Professor Dreyfuss and I remain 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.⁴⁶

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.⁴⁷ This phenomenon elicits pressures for “quality patents” that would presumably result from higher nonobviousness standards,⁴⁸ and the U.S. Supreme Court has recently taken a first step in

⁴² See Reichman & Cooper Dreyfuss, *supra* note 11 at 102-08. See also John Duffy, *Harmony and Diversity in Global Patent Law*, 17 BERKELEY TECHNOLOGY LAW JOURNAL 685 (2002). The notion of nation states as conductors of experimental IP laboratories goes back to Stephen Ladas’ discussion of the Paris Convention for the Protection of Industrial Property (1863). See, STEPHEN P. LADAS, PATENTS, TRADEMARKS AND RELATED RIGHTS – NATIONAL AND INTERNATIONAL PROTECTION (1975). While 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.

⁴³ Professor Kapczynski has now coined the felicitous term of “Counter Harmonization,” which I gratefully adopt here. See Kapczynski, *supra* note 4.

⁴⁴ See, e.g., Gervais, *Epilogue—TRIPS*, *supra* note 4; Carlos Correa, *TRIPS and TRIPS-plus Protection and Impacts in Latin America*, in IP, TRADE AND DEVELOPMENT, *supra* note 8, 221-58.

⁴⁵ Cf. Kapczynski, *supra* note 4; Robert C. Bird, *Developing Nations and the Compulsory License: Maximizing Access to Essential Medicines while Minimizing Investment Side Effects*, 37 J. LAW, MED. & ETHICS, 209-21 (2009).

⁴⁶ See Reichman & Cooper Dreyfus, *supra* note 11 at ____.

⁴⁷ 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). See also Jacques Warcoï, ‘Patent Tsunami’ in the Field of Genetic Diagnostics – A Practitioner’s View, in GENE PATENTS AND COLLABORATIVE LICENSING MODELS, *supra* note 37, 331-38.

⁴⁸ See, e.g., FTC Report (2003), *supra* note 22; NAS Report, *supra* note 22.

this direction,⁴⁹ pending further legislative reforms on the table.⁵⁰ But higher nonobviousness standards, without more, will also expose 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.⁵¹

From this perspective, both the U.S. and foreign experience reveal a cyclical or pendular shifting between states of under and over protection,⁵² 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.⁵³ This same question has now begun to surface in countries such as India and China.⁵⁴ For example, 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.⁵⁵ Besides an appropriately selective nonobviousness standard, in other words, India and similarly situated developing countries also 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.⁵⁶

Of course, traditionalists would respond by recommending greater use of utility model laws,⁵⁷ and there is a trend towards enacting such laws in the developing countries, including China.⁵⁸ But the limits and weaknesses of patent-like utility model laws have been well documented since the 1970s at least, as are their inherent logical and economic

⁴⁹ *KSR International Co v. Teleflex, Inc.* 550 US __, (2007); *see also* in re *Bilski*, 545 F 3d 943 (2008), cert granted, U.S. (2009)..

⁵⁰ S. 515/S. 610/H.R. 1260. 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).

⁵¹ *See, e.g.* Jerome H. Reichman, *Of Green Tulips and Legal Kudzu: Repackaging Rights in Subpatentable Innovation*, 53 *VAND L. REV.* 1743 (2000).

⁵² *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).

⁵³ *See* Jerome H. Reichman, *Saving the Patent Law from Itself*, in *PERSPECTIVES ON THE PROPERTIES OF THE HUMAN GENOME PROJECT*, __ (Kieff and Olin eds., Elsevier Science 2003).

⁵⁴ Janice Mueller, *Biotechnology Patenting in India: Will Bio-Generics Lead a "Sunrise" Industry to Bio-Innovation?*, 76 *UMKC L. Rev.* 437 (2007) and Taking TRIPS to India-Novartis, Patent Law, and Access to Medicine, *New Eng. J. Med.* (2007); Mashelkar Committee Report on Pharma Patenting, available at <http://www.patentoffice.nic.in/>. For China, see Yu, *supra*

⁵⁵ *See supra* note 54.

⁵⁶ *See* Reichman, *Green Tulips*, *supra* note 51

⁵⁷ *See* Reichman, *Legal Hybrids*, *supra* note 52.

⁵⁸ 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.

contradictions, even if such regimes often prove better than nothing.⁵⁹ Moreover, the Japanese experience suggests 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 thus merely 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 may stimulate equally dependent successive applications.⁶⁰

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.⁶¹ 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 systems of innovation in the most developed countries?

That the traditionally structured OECD innovation framework has become increasingly "brittle" over time⁶² appears from even a quick review of its three main premises:

- (1) Upstream scientific research, primarily theoretical in nature, was to remain immune from IPRs and regulated by the sharing norms of Mertonian science;⁶³
- (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; while also providing investors with natural lead time;⁶⁴
- (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.⁶⁵

Today, instead, universities aggressively patent government-funded research results;⁶⁶ many countries protect even scientific databases as such,⁶⁷ and there is no clear line

⁵⁹ See, e.g., Reichman, *Green Tulips*, *supra* note 51 (citing authorities); see also 1974 Swiss study.

⁶⁰ See esp. Eisenberg (2008), *supra* note 47.

⁶¹ BESSEN & MEURER *supra* note 22; Eisenberg (2008), *supra* note 47; Reichman & Cooper Dreyfuss (2007), *supra* note 11.

⁶² Remarks of Jeff Yu, Second Global Forum on Intellectual Property 2009, June 8-9, Singapore.

⁶³ Rebecca Eisenberg, *Property Rights and the Norms of Science in Biotechnology Research*, 97 YALE L.J. 177 (1987); Arti K. Rai, *Regulating Scientific Research: Intellectual Property Rights and the Norms of Science*, NORTHWESTERN L.REV. (1999).

⁶⁴ Reichman, *Saving the Patent Law from Itself*; *supra* note 53.

⁶⁵ See Reichman, *Legal Hybrids*, *supra* note 52.

⁶⁶ NELSON ET AL, *IVORY TOWER AND INDUSTRIAL INNOVATION*, Stanford Business Books (2004); So et al, *supra* note 39.

⁶⁷ 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 2, 81; J.H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?* 50 VAND. L.

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.⁶⁸ 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.⁶⁹

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.⁷⁰ This trend, in turn, produces mounting thickets of rights that impede both technological progress and research, 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.⁷¹

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 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.⁷² 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,⁷³ 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.

REV. 51 (1997). See generally ESTELLE DERCLAYE, *THE LEGAL PROTECTION OF DATABASES: A COMPARATIVE ANALYSIS* (Edward Elgar Publishing, 2008).

⁶⁸ See, e.g., Reichman & Uhler, *supra* note 34; Peter Lee, *Toward a Distributive Commons in Patent Law*, Wis. L. REV. (forthcoming 2009); Peter Lee, *Contracting to Preserve Open Science: Consideration-Based Regulation in Patent Law*, 57 EMORY L.J. 889 (2009); *Science Commons*, *supra* note .

⁶⁹ Reichman, *Green Tulips*, *supra* note 51.

⁷⁰ See, e.g., Pamela Samuelson et al, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308 (1994); Reichman, *supra* note 52.

⁷¹ Eisenberg (2008), *supra* note __.

⁷² See e.g., PATENT POOLS AND OTHER COLLABORATIVE LICENSING MODELS, *supra* note 37. See also EPO Report 2007, available at <http://www.epo.org/about-us/publications/general-information/annual-reports/2007.html>

⁷³ See e.g., Jeremy de Beer, *Defining the WIPO "Development Agenda"*, in IMPLEMENTING THE WORLD INTELLECTUAL PROPERTY ORGANIZATION'S DEVELOPMENT AGENDA 1-23 (Lanvier Univ. Press, Canada, J. de Beer ed., 2009).

1. Measures Concerning Patents

In 1997, I suggested that developing countries could help to 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.⁷⁴

a. Eligibility Standards in BRIC Countries

The one country that has most aggressively pursued this strategy so far is India, which is particularly concerned about its pharmaceutical industry.⁷⁵ Although it cannot legally vary its eligibility standards to suit the needs of different industries,⁷⁶ India's patent eligibility standards are reinforced by pre-grant and post-grant opposition procedures,⁷⁷ which 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.⁷⁸ The new Chinese law definitely adopts a broader more absolute standard of novelty than before,⁷⁹ 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."⁸⁰ The Chinese law will also require disclosure of origin for genetic resources, and may invalidate a pending patent if laws and regulations pertaining to licit procurement and use of such resources had been violated.⁸¹

In general, it seems likely 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 innovations to block local improvers in developing countries and to maintain patent pools that could create formidable barriers to entry. Even the United States has recently begun to elevate its eligibility standards,⁸² although not as steeply as those in India. Because governments cannot discriminate against foreigners,⁸³ however, high standards of eligibility must apply equally to local inventors. The latter, remain free to patent abroad, whatever the status of their inventions at home,⁸⁴ while "second tier" protection may be available to stimulate local investment in small-scale innovation.⁸⁵

⁷⁴ See Reichman, *Free Riders to Fair Followers*, *supra* note __, at 26-42.

⁷⁵ See Indian Patent Statute (2005), arts. 3(d), (e), (f); Kapczynski, *supra* note

⁷⁶ See TRIPS Agreement, *supra* note 9, art. 27.1; Dreyfuss, *supra* note 3.

⁷⁷ See *esp.* Kapczynski, *supra* note 4; Mueller, *supra* note

⁷⁸ See, e.g., Lulin Gao, *supra* note . However, due notice has been taken of *Bilski* in the U.S. *Id.*

⁷⁹ See *id.* (discussing pending arts. 23-24).

⁸⁰ *Id.*, discussing pending art. 63.

⁸¹ *Id.*, discussing pending arts. 5, 27.

⁸² *KSR v. Teleflex*, 550 U.S. 398 (2007); see also *in re Bilski*, 545 F.3d 943 (Fed. Cir 2008), cert granted, ___ U.S. ___ (2009).

⁸³ TRIPS Agreement, *supra* note 9, arts 3-4; Paris Convention, art. 2(1).

⁸⁴ TRIPS Agreement, *supra* note 9, art. 2,1; Paris Convention, art. 4bis (1).

⁸⁵ See further *infra*

However, 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).⁸⁶ 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 for resisting premature harmonization exercises is that, even in developed countries, experts remain uncertain how best to resolve problems affecting cutting-edge technologies,⁸⁷ which makes evaluation of the relevant issues even more difficult in developing countries. For example, 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 which from time to time pose unresolved problems for the patent system as a whole.⁸⁸ These include:

- 1) Broad foundational patents that can block research and downstream applications, and that produce high transaction costs for would-be users.⁸⁹ For example, PCR and recombinant DNA were covered by a few patents, with narrowly averted blocking effects.⁹⁰
- 2) An even bigger problem arises when basic research platforms are covered by multiple patents held by dispersed owners, public and private.⁹¹
- 3) More generally, thickets of overlapping patents may cover a research platform or multiple components of an end product, especially in interdisciplinary research fields. This problem arises, for example, with regard to microarrays, synthetic biology (which combines life sciences, computer science, electrical engineering) and now even nanotechnology.⁹²
- 4) With particular regard to information technology, hundreds of patents on small contributions may yield patent thickets with vague boundaries, resulting in holdups and excessive litigation;⁹³ a similar, if less dramatic process affects

⁸⁶ See Reichman & Cooper Dreyfuss, *supra* note 11.

⁸⁷ See *id.*, at

⁸⁸ Jerome H. Reichman & Jennifer Giordano Coltart, *A Holistic 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).

⁸⁹ See, e.g., Eisenberg (2008), *supra* note 47.

⁹⁰ Reichman & Giordano Coltart, *supra* note 83 (citing authorities).

⁹¹ See Peter Lee, *supra* note __; Cf. Frischman, *supra* note ____

⁹² See, e.g., Rai & Sapna Kumar, *Synthetic Biology: The Intellectual Property Puzzle*, 85 U. Texas Law Review 1745 (2007)

⁹³ See Rai, various studies; BESSEN & MEURER (negative aggregate gains of patents in this sector over costs).

private sector-innovators in biotechnology,⁹⁴ although the extent of this problem in that sector remains controversial.⁹⁵

- 5) Massing of patents for defensive purposes (especially in IT) may block entry to competitors and innovators.⁹⁶

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

These and related problems could inhibit innovation and keep innovators in BRIC countries, and other emerging economies, from realizing their full potential in biotechnology and information technologies. They increasingly deter private-sector researchers and investors in developed countries from exploring promising routes,⁹⁷ while placing universities in a delicate legal position as academics ignore patents when conducting cutting edge research.⁹⁸ Worse, they could eventually complicate the race for innovative climate change technology, if future massive government funding were to replicate problems now experienced in biotech and IT.⁹⁹

Generally speaking, the evidence points to the emergence of complex frontier sciences that may require integrated management in their upstream dimension (and sometimes even in the applications domain). A holistic approach to intellectual infrastructure may then become essential.¹⁰⁰ But the patent system operates on an ad hoc, case-by-case basis that is not designed to address or govern such complex innovation systems. There results a risk of systemic conflict between the holistic needs of frontier science and corresponding innovation policy verses the methodology of traditional intellectual property laws.¹⁰¹

(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;¹⁰²
- An administrative or judicial power to require that the invention be made available on a non-exclusive license;¹⁰³

⁹⁴Jacques Warcoï, *supra* note 47; Eisenberg (2008), *supra* note 47

⁹⁵ *Id.*; Cohen & Walsh.

⁹⁶ *See, e.g.*, Carl Shapiro, *supra* note ____.

⁹⁷ *See, e.g.*, Warcoï, *supra* note 47; Eisenberg (2008), *supra* note 47.

⁹⁸ *See, e.g.*, Cohen & Walsh, *supra* note .

⁹⁹ *See, e.g.*, Reichman, Rai, Newell & Wiener, *supra* note

¹⁰⁰ *Cf. Brett M. Frischmann, An Economic Theory of Infrastructure and Commons Management*, 89 [MINN. L. REV.](#), 9171, 1030 (2005)

¹⁰¹ Reichman & Giordano Coltart, *supra* note

¹⁰² European Patent Convention, art. 64 (1); others

¹⁰³ *EBay Inc. v. MercExchange, LLC.*, 547 U.S. 388 (2006)

- An anti-blocking provision, normally in the form of a compulsory license for dependent patents, that allows improvers to avoid infringing a dominant patent;¹⁰⁴
- An “Essential Facility” Doctrine, familiar from competition law theory and practice, that would allow the pooling of overlapping patents within a platform technology;¹⁰⁵
- Compulsory licensing, either for government (noncommercial) use or to enable third parties to supply the market in the public interest.¹⁰⁶

In practice, the availability of these solutions in developed countries varies from country to country 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.¹⁰⁷ The formal position in the E.U. is better,¹⁰⁸ but actual state practice seems to have narrowed the factual availability of this exception. If so, that state of affairs would afford an obvious opportunity for “counter harmonization”¹⁰⁹ where developing countries could take the lead.

There is no anti-blocking provision in U.S. patent law.¹¹⁰ Hence, 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 sale or use would infringe the former’s patent.¹¹¹ 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,¹¹² unless the government intervenes with a public interest compulsory license.

Many European countries have accordingly codified compulsory licenses for dependent patents,¹¹³ which are perfectly compatible with the TRIPS Agreement,¹¹⁴ 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

¹⁰⁴ See TRIPS Agreement, *supra* note ____, art 31(l); GUSTAVO GHIDINI, *INTELLECTUAL PROPERTY AND COMPETITION LAW: THE INNOVATION NEXUS* (Elgar, 2008).

¹⁰⁵ See, e.g., Hovenkamp, Lemley & Janis, *Anticompetitive Settlement of Intellectual Property Disputes*, 87 *MINN. L. REV.* 1719 (2003); but see Trinko, 540 U.S. 398

¹⁰⁶ See TRIPS Agreement, *supra* note 9, art. 31; Reichman with Hasenzahl, *Non-Voluntary Licensing of Patented Inventions: Historical Perspective, Legal Framework of the Practice in Canada and the U.S.A.* UNCTAD & ICTSD, Issue Paper No 5, June 2003, available at <http://ictsd.net/i/publications/11764/>.

¹⁰⁷ *Madey v. Duke University*, 307 F. 3d 1351 (Fed. Cir. 2002)

¹⁰⁸ EPC, art. 64 (1) [check latest version of treaty]

¹⁰⁹ Kapczynski, *supra* note ____

¹¹⁰ Robert Merges, *Intellectual Property Rights and Bargaining Breakdown: The Case of Blocking Patents*, 62 *U. TENN. L. REV.* 75, 88 (1994)

¹¹¹ GHIDINI, *supra* note 104.

¹¹² *Id.*

¹¹³ See, e.g., Reichman with Hasenzahl, *supra* note 106.

¹¹⁴ See *supra* note 98.

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 possible threat of such an anti-blocking measure, despite the fact that few such licenses were actually granted.¹¹⁵

While China will include a dependant compulsory license in its pending patent reform,¹¹⁶ its availability in other developing countries is not widely reported. Here, in other words one finds a relatively 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. This use of a liability rule, rather than a property rule, seems especially pertinent 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* decision¹¹⁷ in the U.S. have increasingly recognized.¹¹⁸ Professor Kapczynski, among others, rightly commends this approach to the developing countries.¹¹⁹

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 such a solution presents formidable holdout problems that can adversely affect both basic research and downstream applications, as occurred in the case of microarrays.¹²⁰ If nothing is done, a dominant aggregator may sometimes solve the problem by means of vertical integration,¹²¹ while leaving the progress of science in an uncertain state and possibly generating serious antitrust problems to boot.

To solve this problem, when it exists, governments need the 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 trust¹²² and to make the platform available as a whole to downstream applications when the platform becomes an essential infrastructure for future research and innovation.¹²³ In that case, all third parties who use the pooled technology

¹¹⁵ Interviews with Professors Ghidini, Anderman, and Hanns Ullrich.

¹¹⁶ See Lulin Gao, *supra* note

¹¹⁷ See *EBay v. Merck Exchange* 547 U.S. 388 (2006)

¹¹⁸ [cites needed]

¹¹⁹ Kapczynski, *supra* note 9.

¹²⁰ See, e.g., Reichman & Giordano Coltart, *supra* note ; Rai, cite CEER study on Microarrays

¹²¹ See, e.g., Suzanne Scotchmer, A Nonobvious Discussion of Patents, 7th Annual Meredith and Kip Frey Lecture in Intellectual Property, Duke University Law School, available at

<http://www.law.duke.edu/webcast/podcast/?match=Suzanne+Scotchmer> (last visited _____); Arti K. Rai

¹²² See, e.g., Anthony So, *Technology Trusts*, paper presented to the Columbia University Conference.

¹²³ A recent study shows that such a patent pool was necessary to bring the sewing machine to market. See _____ for the government-imposed patent pool enabling the manufacture of airplanes for use in World War I, see Merges & Nelson.

should have to pay equitable compensation from their applications to the bundle or trust, for distribution to rights holders.¹²⁴

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.¹²⁵ but remains in a semi-moribund state under existing case law in the U.S.¹²⁶ Of course, a compulsory license for government use can also 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.¹²⁷ Both India and China have enacted or will enact comprehensive compulsory licensing schedules that clearly encompass such a power.¹²⁸

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,¹²⁹ the TRIPS Agreement limits exports to 49.9% of production.¹³⁰ So it became necessary to amend TRIPS 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 lack manufacturing capacity under compulsory licenses of their own.¹³¹

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.¹³² So this concept of back-to-back

¹²⁴ Cf. Reichman, *Green Tulips*, *supra* note 51.

¹²⁵ See *Microsoft Corp. v Commission of the European Communities*, [T-201/04](#); Ritta Cocco, *Antitrust Liability for Refusal to License Intellectual Property? A Comparative Analysis and the International Setting*, 12 *MARQUETTE L. REV.* 10-21 (2008); Emanuella Arrezzo, *Intellectual Property Rights at the Crossroad between Monopolization and Abuse of a Dominant Position: American and European Approaches Compared*, 24 *JOHN MARSHALL J. COMPUTER & INFORMATION L.* 456-94 (2006).

¹²⁶ *Trinko*, 540 U.S. 398

¹²⁷ *Aircraft Pool*; Reichman with Hasenzahl, see *supra* note

¹²⁸ See, e.g., Kapczynski, *supra* note 1; Lulin Gao, *supra* note ___

¹²⁹ Reichman with Hasenzahl (2003), *supra* note

¹³⁰ TRIPS Agreement, *supra* note 9, art. 31(f).

¹³¹ World Trade Organization, Declaration on the TRIPS Agreement and Public Health, November 20, 2001, WT/MIN(01)/Dec/2, at ¶6; World Trade Organization, Implementation of Paragraph 6 of the Doha Declaration on the TRIPS Agreement and Public Health, Decision of the General Council of 30 August 2003, WT/L/540, August 30, 2003; World Trade Organization, Amendment of the TRIPS Agreement, WT/L/641, December 6, 2005 (pending ratification by Members); Abbott & Reichman, *The Doha Round's Public Health Legacy*, *supra* note ___.

¹³² Abbot & Reichman, *supra* note ___, at 943-944.

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.¹³³

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

The more 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 Act¹³⁴ 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.¹³⁵

Recently, seven American experts published a detailed list of concerns about the effects of the Bayh-Dole Act in the U.S.,¹³⁶ and they recommended the a number of minimum safeguards in the public interest. Perhaps the most fundamental recommendation is that publicly funded university research results should not be exclusively licensed, unless such a license becomes clearly essential for commercialization. Because 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,¹³⁷ an exclusive license is often unnecessary and counterproductive.

Other recommendations these authors put forward are as follows:

- The governing legislation should ensure transparency in the patenting and licensing of publicly funded research results.¹³⁸
- Where initial 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.¹³⁹
- The government should retain an automatic right to use any invention arising from its funding.¹⁴⁰
- Besides promoting commercialization of upstream research results, the government must ensure consumer access to end products on reasonable terms and conditions.¹⁴¹
- Governments should not presume that either patenting or exclusive licenses are necessarily the best options, but may instead “focus on placing, by default, or by strategy, government-funded inventions into the

¹³³ See, e.g., Abbott, *supra* note 38; Reichman *et al*, Chatham House Paper, *supra* note 38.

¹³⁴ Cite Bayh-Dole

¹³⁵ So et al, *supra* note ____; Rai & Eisenberg (2003), *supra* note

¹³⁶ So et al, *supra* note ____

¹³⁷ *Id.*, at 2081.

¹³⁸ *Id.*

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.*, at 2081-82.

public domain, creating a scientific commons, enabling collective management of intellectual property, or fostering open source innovation.”¹⁴²

- Where greater commercial incentives seem necessary, “the benefits of nonexclusive licenses should always be weighed against the social cost of exclusive licenses.”¹⁴³

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 venture capital funds (and, perhaps related research prize contests¹⁴⁴) that might emulate or improve upon the successful models currently deployed in some OECD countries. Unfortunately, India’s hurried enactment of a Bayh-Dole-like statute without due regard to these safeguards¹⁴⁵ does not bode well for the future. Similar statutes are under consideration in numerous other countries, including South Africa,¹⁴⁶ and it remains to be seen whether greater caution will be exercised there than was the case in India.

(3) Smarter Use of Second Tier Regimes

While the emerging economies 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 strategy does not require developing countries to sacrifice their own domestic innovators to free-riding appropriators. Rather, these countries need to outsmart the high-protectionists by fashioning intellectual property regimes that match their own needs and capacities without violating international IP norms.¹⁴⁷ In particular, they could take the lead in making sensible uses of liability rules to stimulate rapid exchanges of cumulative and sequential innovation,¹⁴⁸ especially for purposes of follow-on innovation, while reserving strong exclusive rights for a relatively restricted class of truly path breaking inventions.

¹⁴² *Id.*, at 2082..

¹⁴³ *Id.*

¹⁴⁴ See, e.g., Love & Hubbard, *The Big Idea: Prizes to Stimulate R&D for new Medicines*, *KEI Research Paper 2007:1*; see also Thomas Pogge, *The Health Impact Fund: Boosting Innovation Without Obstructing Free Access*, “The AstraZeneca Lecture of 2008 (EPHAR)?”.

¹⁴⁵ Cites – India’s version of Bayh-Dole

¹⁴⁶ Cites.

¹⁴⁷ Accord: Kapczynski, *supra* note 4.

¹⁴⁸ See *supra* notes ___ and accompanying text; 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..

As previously discussed, there are many ways to achieve this different kind of balance. For example, developing countries can enact and implement compulsory licenses for dependent improvements;¹⁴⁹ by limiting injunctions to cases that demonstrably serve the public interest, now once again a characteristic of United States law and practice;¹⁵⁰ or by codifying an *ex ante* regime of compensatory liability rules that I have elsewhere described.¹⁵¹

(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, with an ever lengthening list of potential tools that could be used to increase research outputs and to achieve better distributional outcomes as well. These include:

- 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;¹⁵²
- Proposals for public-private technology pools that would undo patent thickets and stimulate investment, while preserving revenues from downstream applications for single depositors;¹⁵³
- 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.¹⁵⁴
- Proposals for buy-outs and humanitarian licensing,¹⁵⁵ as well as for pooled procurement strategies under the Amended TRIPS provisions, with a view to

¹⁴⁹ See *supra* notes ___ and accompanying text.

¹⁵⁰ See *supra* notes ___ and accompanying text.

¹⁵¹ See *supra* note ___149[?]

¹⁵² See Arti K. Rai, Jerome H. Reichman, Paul F. Uhlir & 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).

¹⁵³ 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].

¹⁵⁴ 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 in International Intellectual Property Law: The Case for a Public Goods Approach*, 13 MARQUETTE INTELL. PROP. L. REV. 1 (2009).

¹⁵⁵ Kevin Outterson, *Patent Buy-Outs for Global Disease Innovations for Low- and Middle-Income Countries*, 32 AMERICAN JOURNAL OF LAW AND MEDICINE, (2006); Kapczynski, Chaifetz, Katz and Benkler, *Addressing Global Health Inequities: An Open Licensing Approach to University Innovations*, 20 Berkeley Technology Law Journal 1031 (2005); James Love, *Four Practical Measures to Enhance Access to Medical Technologies*, in NEGOTIATING HEALTH, *supra* note ___, 241-56.

- encouraging the distribution of essential medicines on a “high-volume, low-margin” marketing strategy.¹⁵⁶
- Proposals for prizes and other novel research inducements that would help to separate the research and marketing functions in the medical sector.¹⁵⁷

Were the leading developing countries to pursue their own pro-active policies in this area, precisely at a time when their medical research capacity keeps 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.¹⁵⁸ The problems elsewhere observed in regard to information technology and biotechnology have not yet seriously appeared in this sector, perhaps because it is still at an incipient stage, with many small players and with relative few large-scale capital investments.¹⁵⁹ Precisely because emerging economies could participate on the ground floor of future developments in environmental technologies, it behooves their governments to devise collaborative strategies to foster maximum growth and participation, without the impediments that excessive protection have caused in other sectors.¹⁶⁰

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.¹⁶¹ 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, that could help to establish worldwide scientific networks and commons on an unprecedented scale, and that might extend “open source” methodologies to new fields of study.¹⁶² Here, again,

¹⁵⁶ Abbott & Reichman, *supra* note 9

¹⁵⁷ Love & Hubbard, *supra* note 144 .

¹⁵⁸ See, e.g., John H. Barton, Chatham House Paper 2008; John Barton, ICTSD Paper 2008(9?)

¹⁵⁹ See, e.g., Reichman et al, Chatham House Paper, *supra* note ___; Maskus & Okedigi, ICTSD paper, *supra* note

¹⁶⁰ See Chatham House EU-China Project in this regard, *Changing Climates: Interdependencies on Energy and Climate Security for China and Europe*, available at

<http://www.chathamhouse.org.uk/research/eedp/papers/view/-/id/580/>, last visited ___; ICTSD: Geneva Annual China Dialogue: China, Trade and Climate Change, available at <http://ictsd.net/downloads/2009/03/geneva-annual-china-dialogue-on-trade-and-climate-change-meeting-report1.pdf>, last visited ___

¹⁶¹ See, e.g., JAMES BOYLE, *THE PUBLIC DOMAIN*, *supra* note ___; BENKLER, *WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM*, YALE UNIVERSITY PRESS (2007); Rai, *supra* note

¹⁶² See *supra* note ___ . See also Jerome H. Reichman, Paul F. Uhlir & Tom Daederwerdere, *Designing the Microbial Commons*; Peter Lee, *supra* note ___ ; Jonathan Barnett, *Sharing in the Shadow of Property: Rational Cooperation in Innovation Markets* (Univ. S. Cal. Ctr. in Law, Econ. & Org., Research Paper No. C08-22, 2008); Michael J. Madison, Brett M. Frischmann and Katherine J. Strandburg , *Constructing Commons in the Cultural Environment*, CORNELL LAW REVIEW, (forthcoming 2009)

developing countries should be at the center of these initiatives,¹⁶³ and not sit on the sidelines waiting for others to succeed.

2. Measures Concerning Copyrights and Neighboring Rights

Another task badly in need of innovative solutions is the quest for sensible exceptions to, and limitations on, the exclusive rights of domestic copyright laws that are otherwise governed by the TRIPS Agreement and the under-theorized “three-step test” it incorporated from the Berne Convention.¹⁶⁴ 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.¹⁶⁵

Much has been written lately about the excesses of recent copyright legislation in general, and the concomitant expansion of related rights, including database protection laws, which increasingly complicate and obstruct the very creativity and innovation that intellectual property rights were originally designed to promote.¹⁶⁶ Nowhere are these tensions so acute¹⁶⁷ or so likely to generate disproportionately large social costs as in the field of basic scientific research.¹⁶⁸ In particular, abundant evidence now shows that

¹⁶³ See, e.g., Mizukami & Lemos, *From Free Software to Free Culture*, *supra* note ____; Alessandro Octaviani, *Biotechnology in Brazil: Promoting Open Innovation*, in ACCESS TO KNOWLEDGE IN BRAZIL, *supra* note ____, 127-61; Minna Alarakia, I & II.

¹⁶⁴ See TRIPS Agreement, *supra* note 13, art. 13; Berne Convention for the Protection of Literary and Artistic Property (1886), as revised at Paris 1971, art. 9(2).

¹⁶⁵ See, e.g., Max Planck & Queen Mary Declaration on Three-Step Test, available at http://www.ip.mpg.de/shared/data/pdf/declaration_three_step_test_final_english.pdf, last visited ____; Hugenholtz & Okediji, *Conceiving an International Instrument on Limitations and Exceptions to Copyright*, Open Society Institute (2008); KUR & LEVIN, INTELLECTUAL PROPERTY RIGHTS IN TRANSITION. (Edward Elgar, forthcoming 2010); see also Rochelle Cooper Dreyfuss, *TRIPS-Round II: Should Users Strike Back?*, 71 U. CHI. L. REV. 21; 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, available at http://www.cptech.org/a2k/a2k_treaty_may9.pdf (last visited ____).

¹⁶⁶ See generally JAMES BOYLE, THE PUBLIC DOMAIN (2008), *supra* at 26; BENKLER, WEALTH OF NETWORKS; HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (Yale Univ. Press New Haven, 2006); LAWRENCE LESSIG, FREE CULTURE: THE NATURE AND FUTURE OF CREATIVITY (Penguin, 2005); LANGE & POWELL, NO LAW: INTELLECTUAL PROPERTY IN THE IMAGE OF AN ABSOLUTE FIRST AMENDMENT (Stanford Law Books, 2008). See also James Boyle, *The Second Enclosure Movement*, 66 Law & Contemp. Probs. 33 (Winter/Spring 2003); Paul E. Geller, *Beyond the Copyright Crises: Principles to Change*, 55 J. COPYRIGHT SOC'Y USA 165 (2008).

¹⁶⁷ See, e.g., Reto Hilty, *Copyright Law and Scientific Research*, in COPYRIGHT LAW – A HANDBOOK OF CONTEMPORARY RESEARCH (Paul Torremans ed., Edward Elgar, 2007); Reto Hilty, *Five Lessons about Copyright in the Information Society: Reaction of the Scientific Community to Over-Protection and What Policy Makers Should Learn*, 53 J. COPYRIGHT SOC'Y U.S.A. 103 (2006); Pamela Samuelson, *Anticircumvention Rules: Threat to Science*, 293 SCI. MAG. 2028 (2001), available at <http://www.sciencemag.org/cgi/content/abstract/293/5537/2028> (last visited Apr. 29, 2009); Jerome H. Reichman & Paul F. Uhlir, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 66 LAW & CONTEMP. PROBS. 315 (2003).

¹⁶⁸ See e.g., Paul A. David (2009); Paul A. David, *Koyaanisqatsi in Cyberspace: The Economics of an “Out-of-Balance” Regime of Private Property Rights in Data and Information*, in INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED INTELLECTUAL PROPERTY REGIME (Keith

science-hostile intellectual property laws, in combination with the science publishers' restrictive licensing practices, collide head on with core advances in digitally integrated scientific research methods.¹⁶⁹

a. Privatizing the Scientific Research Commons

On the one hand, new information technologies and related scientific tools, especially bioinformatics, are transforming traditional scientific fields, such as molecular biology, and spawning new fields, such as genomics and proteonomics, with unlimited scientific opportunities in the digital environment.¹⁷⁰

The use of computational methodologies, such as bioinformatics, in the building of global collections of articles and data and in the integration of relevant research results makes it possible to build accumulative, field specific knowledge repositories that capture reams of relevant scientific and technical information and data and to develop general data-mining tools for automated knowledge discovery in the chosen environment. Added value to users is further potentiated when automated knowledge-discovery tools can be readily applied to the relevant scientific literature. To this end, the digitization of scientific information offers formidable opportunities for enhanced speed of dissemination of publicly funded research, for the development of high performing research engines that diminish the search time for publications, and for automated cross-linking and text mining based on standardized metadata.¹⁷¹

The worldwide scientific community needs to develop and expand these digital opportunities, especially at public research institutes and universities, while maintaining the classical functions of certification and diffusion of research results inherited from the pre-digital print epoch.¹⁷²

On the other hand, the digital revolution that created such promising opportunities for scientific research “also generated intense fears that hardcopy publishers would become vulnerable to massive infringements online and to other threats of market failure.”¹⁷³ In response, publishers pushed legislatures to recast and restructure copyright law in the online environment so as to preserve business models built around the print media.¹⁷⁴ In so doing, they managed to curb pre-existing limitations and exceptions (L&Es) in the

E. Maskus & Jerome H. Reichman eds., Cambridge Univ. Press, 2005); *See, e.g.*, P.A. David, *The Economic Logic of 'Open Science' and the Balance between Private Property Rights and the Public Domain in Scientific Data and Information: A Primer*, in NATIONAL RESEARCH COUNCIL ON THE ROLE OF THE PUBLIC DOMAIN IN SCIENCE (P.Uhlir & J. Esanu eds., National Academy Press, 2003)

¹⁶⁹ *See generally* REICHMAN, UHLIR, & DEDEURWAERDERE, DESIGNING THE MICROBIAL RESEARCH COMMONS, Chapter 3 (Draft August 2009); Reichman & Okediji, *Empowering Digitally Integrated Scientific Research: The Pivotal Role of Copyright Law's Limitations and Exceptions* (Draft May 5, 2009).

¹⁷⁰ REICHMAN, UHLIR, & DEDEURWAERDERE, *supra* note ___ at ___.

¹⁷¹ *Id.*, at ___ (citations omitted).

¹⁷² *See id.*

¹⁷³ Reichman & Okediji, *supra* note ___, at 8.

¹⁷⁴ *See* Pamela Samuelson, *The U.S. Digital Agenda at WIPO*, 37 VA. J. INT'L L. 369 (1997).

online environment, including those favorable to science;¹⁷⁵ to embed pay-per-use machinery into electronic fences surrounding online transmissions even of scientific articles;¹⁷⁶ and, particularly in the EU and increasingly elsewhere, to add new sui generis data protection disciplines that restrict access to the very facts, data, and information that are the lifeblood of basic scientific research.¹⁷⁷

As a result, thickets of rights, backed by Technological Protection Measures (TPMs) and Digital Rights Management restrictions in the online environment, impede effective exploitation of new automated knowledge tools by blocking integrated access to scientific information and data scattered over a broad range of articles and databases that may or may not be available online.¹⁷⁸ Scientists need, and traditionally depend on, a robust public domain, in which existing information and data become inputs to future knowledge assets that cannot be generated without them. Instead, successful special interest lobbying at both the national¹⁷⁹ and international levels¹⁸⁰ have overprotected existing knowledge goods at the expense of the public domain, while compromising digitally empowered scientific research opportunities with little regard for the social costs and burdens imposed on future creation and innovation.

High level officials at the European Commission have publicly recognized the dangers to public science in this situation.¹⁸¹ In 2008, the Commission itself issued a Green Paper, seeking to foster a debate on how to better promote “the free movement of knowledge and innovation” in the European Union’s single market, with particular regard to the dissemination of research, science and educational materials.¹⁸²

¹⁷⁵ See Reichman & Uhler, *supra* note ___, at 371-373.

¹⁷⁶ *Id.*, at 371-396.

¹⁷⁷ Reichman & Okediji, *supra* note ___, at 90. See also ESTELLE DERCLAYE, *supra* note ___; Jerome H. Reichman & Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 52 (1997).

¹⁷⁸ See, e.g., Nancy L. Maron & K. Kirby Smith, Current Models of Digital Scholarly Communication: Results of an Investigation Conducted by Ithaka for the Association of Research Libraries 27 (November 2008), available at <http://www.arl.org/bm~doc/current-models-report.pdf> (last visited Apr. 27, 2009); Reto Hilty, *Copyright Law and Scientific Research*, in COPYRIGHT LAW: A HANDBOOK OF CONTEMPORARY RESEARCH, 315 (Edward Elgar Publishing, 2007); Paul David, *New Moves in 'Legal Jujitsu' to combat the Anticommons: Mitigating IPR Constraints on Innovation by a 'Bottom-up' Approach to Systemic Institutional Reform*, ESNIE (2008); Jerome H. Reichman, Graeme B. Dinwoodie & Pamela Samuelson, *A Reverse Notice and Takedown Regime to Enable Public Interest Uses of Technically Protected Copyrighted Works*, 22 BERKELEY TECH. L.J. 981 (2007). See also Geller, *supra* note ___, at 166 (“copyright law is in crisis... [I]t has become more and more complicated and less and less reliable, while losing legitimacy.”).

¹⁷⁹ See, e.g., U.S. DMCA; EC Information Society Directive; EC Directive on the Legal Protection of Databases.

¹⁸⁰ See, e.g., WCT (1996); WPPT (1996). Very restrictive domestic implementation of these treaties is then re-exported to developing countries by means of bilateral or regional Free Trade Agreements. See, e.g., Bryan Mercurio, *TRIPS-Plus Provisions in FTAs: Recent Trends*, in REGIONAL TRADE AGREEMENTS AND THE WTO LEGAL SYSTEM, Bartels, Ortino, eds, pp. 215-237, Oxford University Press (2006)

¹⁸¹ See, e.g., Remarks of Tilman Lüder, Singapore Conference (Jan. 2009); Remarks of Tilman Lüder, Workshop on Creation and Innovation, Fordham Conference, Cambridge, U.K. (April 2009); EC Study criticizing Directive on the Legal Protection of Databases.

¹⁸² European Commission Green Paper on Copyright in the Knowledge Economy, at 1.2, available at http://ec.europa.eu/internal_market/copyright/docs/copyright-infso/greenpaper_en.pdf

Notwithstanding these initiatives, publishing interests in the EU and the OECD countries generally are so entrenched that there are few realistic prospects for top down legislative reforms, despite mounting worldwide pressures for greater “access to knowledge”.¹⁸³ This resistance has prodded the scientific community to make greater efforts to manage its own essential knowledge inputs by means that attempt to neutralize the impediments of intellectual property rights for upstream research.¹⁸⁴ Some of the initiatives, particularly those spun off from the Creative Commons and Science Commons movements, have spread to developing countries, with notable success, for example, in Brazil.¹⁸⁵

b. Remedial Measures Available to the BRIC Countries

Developing countries labor under intense pressures from developed countries to duplicate the very barriers to digitally integrated scientific research that have been erected in OECD countries. Instead, the BRIC countries in particular should collectively resist these pressures self-consciously adopt limitations and exceptions to copyright and related laws that would digitally empower their own scientific research communities without necessarily violating the relevant international intellectual property agreements. If these countries, and other emerging economies, marshaled the political will and governance capacity to undertake such reforms, leadership in this area might give them a comparative advantage at a time when local scientific and technical innovation has begun to flourish in many key industrial sectors.

Accordingly, our two most fundamental recommendations are as follows:

- First, the BRIC countries should codify the idea-expression dichotomy now established in the TRIPS Agreement¹⁸⁶ as a central subject matter exception, and

¹⁸³ Amy Kapczynski, *The Access to Knowledge Mobilization and the New Politics of Intellectual Property Law*, YALE LAW JOURNAL, Vol. 117, No. 804 (2008); Kapczynski, *Linking Ideas to Outcomes: A Response*, The Yale Law Journal Pocket Part, 19 August 2008. James Love, *Risks and Opportunities for Access to Knowledge*, in *Vision or Hallucination? Briefing Papers towards the World Summit on the Information Society*, Third World Network (2005). Proposed Access to Knowledge Treaty, *supra* note 147

¹⁸⁴ Strongly recommended by Reichman & Uhler (2003), *supra* note ____, at _____. See most recently *supra* note; Ed Lazowska and Peter Lee, *Fundamental Research in Engineering*, in *Computing Research Initiatives for the 21st Century*, Computing Community Consortium of the CRA (version 6, December 2008); Peter Arsha, Ed Lazowska and Peter Lee, *Information Technology R&D and US Innovation*, in *Computing Research Initiatives for the 21st Century*, Computing Community Consortium of the CRA (version 9: December 2008); M. Allarakhia, D. Kilgout, J. Fuller, *Game Models of the Defection Dilemma in Biopharmaceutical Discovery Research*, Proceedings of the PICMET' 07 Conference, Portland International Center for Management of Engineering Technology (2008); M. Allarakhia, *Research Section: Open Source Biopharmaceutical Innovation – A Mode of Entry For Firms in Emerging Markets*, *Journal of Business Chemistry*, Vol. 6, issue 1, p.11 (2009); USDC article. See also *Creative Commons and Science Commons*; John Wilbanks

¹⁸⁵ Pedro Paranaguá, *A Comprehensive Framework for Copyright Protection and Access to Knowledge: From a Brazilian Perspective and Beyond*, in Carlos M. Correa and Xuan Li, *South Perspective - How Developing Countries Can Manage Intellectual Property Rights to Maximize Access to Knowledge*, (2009); Mizukami & Lemos, *supra* note .

¹⁸⁶ See TRIPS Agreement, *supra* note ____, art. 9.2

- they should clarify that the legislative intent is to implement this exception at least as broadly as U.S. federal appellate courts routinely do.¹⁸⁷
- Second, because the “use of automated knowledge tools in general and computational science in particular, requires scientists to reproduce entire articles from scientific journals; to extract excerpts of varying lengths from them; and to incorporate large extracts of data into their digital research tools for data mining, virtual experiments, and other forms of digital manipulation,”¹⁸⁸ the BRIC countries will need a broad and sweeping exemption for scientific research uses of literature and data that requires no gloss, no fine print, and no elaborately contrived carve outs to a grudgingly acknowledged limitation or exception.”¹⁸⁹

In this connection, the Max Planck Institute has proposed that such a broad and general exemption should allow use and reuse of published scientific materials for virtually any scientific purpose, with express legitimization of storage, archiving, data extraction, linking and the like.¹⁹⁰ Such a reform should further clarify that scientists remain free to subject any published articles, and any scientific work made publicly available online, to data mining procedures, data manipulation by automated knowledge tools, including virtual scientific experimentation, without any constraint other than attribution under the norms of science.¹⁹¹ Obviously, any database protection laws that the BRIC countries were unwise enough to enact (as, for example, by succumbing to pressures for bilateral agreements with the E.U.) would have to be similarly aligned with such a broad copyright exemption for uses of scientific literature.¹⁹²

Beyond these fundamental policy positions bearing on scientific research, the BRIC countries should revise and expand their copyright exceptions for libraries and educational institutions generally in order to fully exploit the policy space deriving from flexibilities set out in the TRIPS Agreement and other relevant treaties, especially the WIPO Copyright Treaty of 1996.¹⁹³ In this connection, the library community has been developing a plan of action to promote access to knowledge in developing countries, with particular regard to eliminating legal barriers to cross-border flows of books, periodicals and other information in both the print media and the online environment.¹⁹⁴ Cooperating countries that implement such proposals could gradually build a contractually created space in which their domestic arrangements accommodating

¹⁸⁷ Reichman & Okediji, *supra* note __, at 24

¹⁸⁸ *Id.*, at 28; see, e.g., Victoria Stodden, Enabling Reproducible Research: Open Licensing for Scientific Innovation, *International Journal of Communications Law and Policy*, Issue 13 (2009) at 24-25 (citing authorities).

¹⁸⁹ Reichman & Okediji, *supra* note __, at 24

¹⁹⁰ European Commission - Green Paper: Copyright in the Knowledge Economy - Comments by the Max Planck Institute for Intellectual Property, Competition and Tax Law, Max Planck Institute for Intellectual Property, Competition & Tax Law Research Paper Series No. 08-05

¹⁹¹ Reichman & Okediji, *supra* note __, at 30. For further nuances concerning derivative works and possible downstream applications to commercial products justifying use of compensatory liability rules, see *id.*, at 30-32.

¹⁹² *Id.*, at __. *Accord* Max Planck Response to Green Paper, *supra* note __, at 11.

¹⁹³ See WCT, *supra* note __, arts. 10__ plus Agreed Statement.

¹⁹⁴ See IFAL draft proposals, <http://www.ifal.org.uk/info.html>

science, education and libraries were given mutual and reciprocal recognition.¹⁹⁵ Equally essential are clear legal measures to enable the bulk purchasing of foreign educational texts on reasonable terms and conditions.¹⁹⁶

The BRIC countries, together with governments in other emerging economies, should also consider the potential advantages of adopting a “fair use” provision, in order to leave elbow room for courts to deal with fact-specific situations falling outside the codified exceptions, which invariably occur in practice. Such a fair use option would enable developing countries to create a buffer zone available when other provisions favoring research, education and libraries appear unclear or uncertain and yet the use in question serves the larger public interest without undue harm to authors.¹⁹⁷ Properly administered, a fair use provision could also justify ad hoc use of compensation to resolve apparent conflicts between private and public interests, and it would help to attenuate potential conflicts between copyright law’s exclusive rights and both fundamental human rights, especially free speech, and the overriding “objectives and principles” of the TRIPS Agreement, as set out in articles 7 and 8.¹⁹⁸

However, any serious discussion of the trend toward adopting “fair use” regimes outside the English-speaking countries¹⁹⁹ must address a concern implicit in all the previous discussion, namely, how to reconcile broad exceptions in domestic copyright laws with the three-step test governing limitations and exceptions in international copyright laws, as set out in article 13 of the TRIPS Agreement²⁰⁰ and further elucidated in article 10 of the WCT (together with the relevant Agreed Statement thereto).²⁰¹ Fortunately, the Max Planck Institute, following exhaustive discussions among more than twenty experts, has prepared a Declaration on the Three-Step Test.²⁰² Building on the WCT Preamble²⁰³ it would:

- Mandate that courts applying the three-step test of article 13 in copyright cases take into account the interests of third parties, including individual and collective interests of the general public, and not just the interests of rights owners.²⁰⁴

¹⁹⁵ Cf. Reichman & Uhler (2003), *supra* note ___, at 429-430 (discussing possible “treaties” between universities to regulate the sharing of government-funded data).

¹⁹⁶ See, e.g., Ruth C. Okediji, *Sustainable Access to Copyrighted Digital Information Works in Developing Countries*, in INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED IP REGIME, *supra* note ___.

¹⁹⁷ Reichman & Okediji, *supra* note ___, at ___

¹⁹⁸ Id., ___ at ___; Peter K. Yu, *The Objectives and Principles of the TRIPS Agreement*, 46 HOUSTON LAW REVIEW, (forthcoming, 2009)

¹⁹⁹ [cite evidence of trend toward fair use regimes] Okediji, *Toward an International Fair Use Regime*, 39 COLUM. J. TRANSNAT’L L. 39, 75 (2000)

²⁰⁰ TRIPS Agreement, *supra* note ___, art. 13.

²⁰¹ WCT, *supra* note ___, Preamble, plus art. 10 (with Agreed Statement)

²⁰² Max Planck Declaration on three-step test, *supra* note ___

²⁰³ WCT, *supra* note ___, Preamble (quote).

²⁰⁴ Cf. TRIPS Agreement, *supra* note ___ art. 30 (three step test for exceptions to domestic patent laws, which recognizes “the legitimate interests of third parties”).

- Avoid prioritizing any one step, or requiring that the answer to all steps should be “yes,” but would instead require a judicial balancing of the different prongs, as occurs under US fair use law.²⁰⁵
- Give particular weight to unauthorized uses that are underpinned by fundamental rights²⁰⁶ and other “common interests,” notably “in scientific progress and cultural or economic development.”²⁰⁷
- Seek to promote competition, especially on secondary markets, by a correct balancing of interests, but without making the three-step test a proxy for competition law.
- Expressly recognize that adequate compensation may be less than market pricing, where other public concerns are at stake, including third party interests or the general public interest.²⁰⁸

The BRIC countries should set an example for other developing countries by incorporating these proposals into their domestic laws, by supporting their incorporation into the WIPO Development Agenda, and, if necessary, by defending the tenets of the Declaration in WTO Dispute Resolution Proceedings if they are challenged.²⁰⁹

Finally, no reform of the copyright laws’ limitations and exceptions would be worth much in practice if the resulting provisions could not be enforced online or if publishers could simply override them by contract. As regards the online environment, the WCT of 1996 clearly preserved a signatory state’s rights to maintain all limitations and exceptions “permitted by law” when implementing international obligations to protect copyrightable works transmitted through digital networks by means of TPMs and DRMs.²¹⁰ However, the implementing legislation in the United States, i.e., the DMCA, declined to exercise this treaty-given power,²¹¹ while the E.U.’s implementing legislation, the Infosoc

²⁰⁵ See 17 U.S.C. § 107 (1976):

. . . In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—

- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

But see Mihály Ficsor, *THE LAW OF COPYRIGHT AND THE INTERNET : THE 1996 WIPO TREATIES, THEIR INTERPRETATION AND IMPLEMENTATION* (Oxford Univ. Press, 2002) (arguing that the legislative history of the Berne Convention prohibits this approach).

²⁰⁶ Cf. LANGE & POWELL, *supra* note (stressing the First Amendment); Hugenholtz & Okediji, *supra* note ; Helfer, *Toward a Human Rights Framework for Intellectual Property*, 40 U.C. DAVIS L. REV., 971 (2007).

²⁰⁷ Cf. Chon, *supra* note .

²⁰⁸ Max Planck Declaration, *supra* note at 2.

²⁰⁹ See *infra* text accompanying notes ____

²¹⁰ See WCT, *supra* note , arts. 10, 11 and 12 (plus Agreed Statement concerning Article 10)

²¹¹ DMCA, *supra* note ____, §§1201-1205.

Directive of 2001²¹², simply avoided the issue, which was tantamount to the same result.²¹³

Developing countries should take exactly the opposite path by exercising the inherent power of all WCT signatories to implement all limitations and exceptions “permitted by law” in the online environment.²¹⁴ The first step is to enact legislation that expressly applies limitations and exceptions favoring scientific research, education and libraries to works transmitted over digital networks, irrespective of the TPMs and DRMs that otherwise regulate such transmissions. The next step is to further adopt measures that effectively enable the beneficiaries of these exceptions to enforce them despite the electronic fences and digital locks that impair access to protected works in cyberspace.²¹⁵ This result can be achieved, for example, by means of a system of “electronic locks and keys” to break through the electronic fences for specified purposes²¹⁶ or by resort to the less costly and burdensome “reverse notice and takedown” procedure that Professors Reichman, Dinwoodie and Samuelson have elsewhere proposed.²¹⁷ The latter procedure enables would-be privileged users to oblige copyright proprietors to make relevant materials available without the former having to cross the electronic fence or enter the digitally locked gateway at all.²¹⁸

Needless to say, neither approach will suffice if copyright proprietors can override applicable limitations and exceptions by contract, especially one-sided electronic contracts that regulate lawful access to digitally transmitted works. Hence, developing country legislators need to ensure that none of the key exceptions favoring research, education and libraries can be waived or overridden by contract, especially in the online environment.²¹⁹

Looking back at this topic, one may observe that it is precisely the BRIC countries, and other emerging economies, that have the greatest interest in treating access to scientific knowledge and educational materials as a domestic and global public good, one which cannot be privatized beyond limits set by domestic law and policy.²²⁰ While operating within the confines of existing international intellectual property laws, it behooves these countries—both at the domestic and regional levels—to play a leadership role in

²¹² Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society, art. 6/4, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0029:EN:HTML>

²¹³ Reichman, Dinwoodie & Samuelson, *supra* note ___ at ___ (citing authorities)

²¹⁴ WCT, *supra* note ___, art.

²¹⁵ See, e.g., Lemley & Reese, *Reducing Digital Copyright Infringement Without Restricting Innovation*, 56 STANFORD L. REV., 1345 (2004); Reichman, Dinwoodie & Samuelson, *supra* note ___.

²¹⁶ See Reichman & Okediji, *supra* note ___, at __ (citing authorities).

²¹⁷ Reichman, Dinwoodie & Samuelson, *supra* note ___.

²¹⁸ *Id.*, at ___.

²¹⁹ See, e.g., Max Planck Institute’s Response to the EC Green Paper, *supra* note ___; Reichman & Okediji, *supra* note ___.

²²⁰ Cf. Maskus & Reichman, *supra* note ___; Stiglitz, *Knowledge as a Global Public Good*, in *Global Public Goods*, Vol 1, No. 9 (1999); see also CIMOLI, STIGLITZ AND DOSI, *INDUSTRIAL POLICY AND DEVELOPMENT: THE POLITICAL ECONOMY OF CAPABILITIES ACCUMULATION* (Oxford Univ.Press, 2009).

implementing and amplifying the flexibilities in the relevant international conventions, especially with a view to benefiting their own research and educational communities.

At the multilateral level, these countries should evaluate the extent to which their own needs for access to knowledge obliges them to support WIPO Development Agenda goals consonant with those needs, in opposition to the high-protectionist policies favored by the U.S. and the E.U.²²¹ Bold legislative initiatives in domestic laws on these matters could thus help to set and define the international copyright law agenda for the next several decades.

3. Measures Concerning Competition Law and Misuse

There is nearly 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.²²² Here the high and middle-income developing countries need to formulate competition law rules and policies to ensure that foreign technologies and know-how flow to local markets under reasonable terms and conditions and at prices local entrepreneurs can afford.²²³ In so doing, they should fully exploit the competition law exceptions available under the TRIPS Agreement,²²⁴ and they should draw upon solutions and proposals emanating from both past and present practices in OECD countries and elsewhere, given the political will and skill to do so.

However, resorting to competition law and policy has so far proved difficult for most developing countries. In part, this reluctance may stem from the complex economic analysis, high transaction costs, and regulatory skills associated with the practice of competition law in the most developed countries.²²⁵ Moreover, key differences between E.U. practice, which emphasizes measures to prevent abuse of a dominant position, and – until recently – the less aggressive stance of the U.S. authorities, who seek evidence of actual or intended monopolization,²²⁶ may hinder clear thinking about the relevant

²²¹ See *supra* note ____; *infra* notes ____.

²²² 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. See also Sean Flynn Aidan Hollis & Mike Palmado, *An Economic Justification for Open Access to Essential Medicine Patents in Developing Countries*, 37 J. LAW, MED. & ETHICS 184, 191-93 (2009).

²²³ J. H. Reichman, *Nurturing a Transnational System of Innovation*, 16 J. TRANSNAT. L. & P. 143, 161 (2007).

²²⁴ 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.

²²⁵ See, e.g., H. J. Hovenkamp, *The Intellectual Property—Antitrust Interface*, University of Iowa College of Law, Legal Studies Research Paper No. 08-46, 2008, at 1979-2007, available at <http://ssrn.com/abstract+1287628> (2008)

²²⁶ See, e.g., Emanuela Arezzo, *Intellectual Property Rights at the Crossroad between Monopolization and Abuse of a Dominant Position: American and European Approaches Compared*, 24 JOHN MARSHALL J. COMPUTER & INFORMATION L. 456-94 (2006).

problems in developing countries. Both the E.U. and U.S. regimes depend on complex proof of market power, although long-standing (but increasingly disfavored) common law precedents in patent law allow U.S. courts to suspend enforcement of valid patents for acts of “misuse” even in the absence of market power.²²⁷

Besides these technical intricacies, policymakers in developing countries that become serious about the interface between intellectual property and competition law must take high level decisions about the goals of competition law in general, i.e., efficiency or fairness, or some combination of both.²²⁸ They must then reconcile their versions of competition law with the incentives to innovate that flow from the exclusive rights of intellectual property laws.²²⁹ Here again they may be deterred by prevailing tendencies in developed countries to view competition law and intellectual property laws as complementary means of mutually promoting social welfare, rather than as disparate regimes in conflict with one another.²³⁰ This view makes doctrines that override intellectual property rights, such as the “essential facility” doctrine much invoked in European scholarship, much harder to obtain in practice than in theory.²³¹

Although developing countries have lagged behind in the field of competition law, the fact that both India and China have begun to formulate law and policy in this area may serve to stimulate other emerging economies that have so far played virtually no formative role in this area at all. Also pressing in this direction are the self-help measures that competition law might afford these countries if and when market failures of various kinds impede access to green technologies, as many fear will occur.²³² Policymakers would accordingly be well advised to track early U.S. cases that emphasize fairness over efficiency.²³³ They should also adopt both the “abuse of a dominant position” approach of E.U. competition law and flexible doctrines of “patent misuse” historically rooted in U.S. patent law, which could reach refusals to deal, excessive prices, and undersupply of the market, without a showing of market power.²³⁴ But such measures must be applied equally to domestic and foreign firms, without discrimination,²³⁵ which raises serious obstacles in most emerging economies.

²²⁷ See Hovenkamp, *supra* note __, at 1991; *Illinois Tool Works v. Indep. Ink*, 126 Sup. Ct. 1281 (2006).

See generally T.F. Cotter, *Misuse*, 44 HOUSTON L. REV. 901-64 (2007).

²²⁸ See, e.g., Fox, *supra* note __, at 758; Ullrich, *supra* note __, at 726.

²²⁹ See, e.g., GUSTAVO GHIDINI, *INTELLECTUAL PROPERTY AND COMPETITION: THE INNOVATION NEXUS* 103-11 (Elgar 2008).

²³⁰ See Hovenkamp, *supra* note __; Fox, *supra* note __; Drexel, *supra* note __.

²³¹ See, e.g., Rita Coco, *Antitrust Liability for Refusal to License Intellectual Property: A Comparative Analysis and the International Setting*, 23 MARQUETTE L. REV. 10-21 (2008).

²³² See, e.g., Reichman, Rai, Newell & Weiner, *Chatham House Paper on Green Technology* (Preliminary Draft version 2008); Maskus & Okediji, *supra* __; see also Frederick Abbott, *Innovation and Technology Transfer to Address Climate Change: Lessons from the Global Debate on Intellectual Property and Public Health*, *Intellectual Property and Sustainable Development Series Issue Paper No. 24*

²³³ See esp. Fox, *supra* note __.

²³⁴ See Paris Convention, *supra* note __, art. 5A; G.H.C. BODENHAUSEN, *GUIDE TO THE APPLICATION OF THE PARIS CONVENTION FOR THE PROTECTION OF INDUSTRIAL PROPERTY, AS REVISED AT STOCKHOLM IN 1967*, 71 (1968); Cotter, *supra* note __. See also Reichman with Hasenzahl, *ICTSD* (2003), *supra* note __.

²³⁵ See TRIPS Agreement, *supra* note __, arts. 3, 8.2, 40; cf. Paris Convention, *supra* note __ art. 2(1).

C. Revitalizing A Petrified Intellectual Property System

The foregoing exercise attempted to illustrate how the BRIC countries, and other emerging economies, could forge needed solutions to burgeoning intellectual property problems that developed countries have either neglected or failed to resolve. In this endeavor, BRIC countries would be motivated by the greater stake they now have in what Carolyn Deere has felicitously called the “Implementation Game,”²³⁶ owing to steadily mounting pay offs from strategic uses of locally-generated knowledge goods. By carefully re-evaluating their own intellectual property needs in the light of growing technological capacities, they could begin to overhaul and reshape an “out of balance system”²³⁷ driven by ideology and power politics, to address the real conditions of creativity and innovation in today’s digitally empowered universe of scientific discourse.

Once embarked along such a path, policymakers in these countries would discover the growing importance of publicly accessible infrastructure in the development of new and complex technological paradigms.²³⁸ They would profit from the problem-solving capacities of liability rules, especially when applied to upstream research outputs and tools that lack clear market values and that lend themselves to multiple downstream applications of unknown or uncertain value.²³⁹ They would strive for more fluid and balanced interchanges between public and private goods in knowledge economies driven by both heavy public investment in basic research and by private investment in translating that research into workable commercial products.²⁴⁰

²³⁶ CAROLYN DEERE, *THE IMPLEMENTATION GAME – THE TRIPS AGREEMENT AND THE GLOBAL POLITICS OF INTELLECTUAL PROPERTY REFORM IN DEVELOPING COUNTRIES* 1-25 (Oxford U. Press, 2009).

²³⁷ Cf. Paul David, *supra* note

²³⁸ See, e.g., Brett Frischman, *Infrastructure* ____, *supra* note ; Peter Lee (I) &(II), *supra* note ; Jerome H. Reichman & Jennifer Coltart, *A Holistic Approach to Frontier Science: Lessons of the Seminal Genomic Technology Studies* (2009). See generally BENKLER, *WEALTH OF NETWORKS*, *supra* note

²³⁹ See, e.g., Reichman, Uhler & Dedeurwaerdere, *supra* note , chap. 2 (proposing compensatory liability regime for commercial applications of materials deposited for research purposes in culture collections); Victoria Henson-Apollonio, *The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA): The Standard Material Transfer Agreement as Implementation of a Limited Compensatory Liability Regime*, in *GENE PATENTS AND COLLABORATIVE LICENSING MODELS: PATENT POOLS, OPEN SOURCE MODELS AND LIABILITY REGIMES* 289-93 (G. Van Overwalle ed. Cambridge U. Press, 2009); 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, POL., LAW & ETHICS* 1-36 (2008) (proposing liability rule for pre-competitive pooling of small molecule libraries for high throughput screening); Jerome H. Reichman & Tracy Lewis, *Using Liability Rules to Stimulate Local Innovation in Developing Countries: Application to Traditional Knowledge*, in *INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED IP REGIME*, *supra* note ,337-66; see generally, J.H. Reichman, *Green Tulips*, *supra* note (proposing compensatory liability regime for small-scale innovation)

²⁴⁰ See, e.g., Anthony So et al, *Is Bayh-Dole Good for Developing Countries? Lessons from the U.S. Experience*, 6 *PLoS Biology* 2078 (Oct. 2008), available at www.plosbiology.org ; Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 *LAW & CONTEMP. PROBS.* 289 (2003); V.C. Vivekanandan, *The Public-Private Dichotomy of Intellectual Property: Recommendations for the WIPO Development Agenda*, in *IMPLEMENTING THE WORLD INTELLECTUAL PROPERTY ORGANIZATION’S DEVELOPMENT AGENDA* 131-39 (J. De Beer, ed., 2009).

In sum, the BRIC countries, pursuing their own self-interest in economic growth, could break the maximalists' stranglehold on intellectual property law-making exercises, by which aims mainly to preserve a "knowledge cartel's" comparative advantage in existing technological outputs at the expense of future innovation that requires more subtle forms of nurture.²⁴¹ In so doing, the BRIC countries would devise and test new approaches and solutions that could redound to the benefit of technology-exporting countries everywhere, most of which seem incapable of reforming their increasingly dysfunctional innovation systems at the present time.

D. Obstacles to Implementing "Counter-Harmonization" Initiatives

The question this optimistic portrait begs, however, is why developing countries have not already taken longer strides in this direction when implementing their responses to the challenges that adoption of the TRIPS Agreement posed after 1994. Carolyn Deere's recent efforts to answer that very question afford a bleak and cautionary picture of the obstacles that stand in the way of autonomous intellectual property reforms.²⁴²

She shows, for example, that strong economic pressures, including the threat of trade sanctions and other diplomatic measures, combined with offers of future trade concessions, were more likely to produce TRIPS-plus provisions in Free Trade Agreements than efforts to invoke existing flexibilities in the TRIPS Agreement.²⁴³ High-level lobbying by specialized knowledge communities, backed by one-sided technical assistance from WIPO and government agencies in developed countries²⁴⁴ further "shape[d] developing country perceptions of the political climate and their room for maneuver within it,"²⁴⁵ although countervailing efforts by NGOs, academics and others became more effective over time.²⁴⁶

On the domestic front, a lack of technical expertise hampered many developing countries.²⁴⁷ Even when the relevant expertise emerged over time, the lack of internal government coordination among agencies affected by intellectual property law and policy left too much power in the hands of national IP offices, who were more likely to share the views of their foreign counterparts, and also left non-expert government officials more

²⁴¹ Maskus & Reichman, *Globalization of Private Knowledge Goods*, *supra* note ____; See Reichman & Cooper Dreyfus, *Harmonization Without Consensus*, *supra* note ____ at ____

²⁴² See generally, CAROLYN DEERE, *supra* note ____, chaps. 5-7.

²⁴³ *Id.*, at 150-67.

²⁴⁴ See, e.g., S. Musungu & G. Dutfield, *Multilateral Agreements and a TRIPS-Plus World: The World Intellectual Property Organization*, Quaker United Nations Office (QUNO) and Quaker International Affairs Program (QIAP), TRIPS Issues Paper No. 3 (2003)

²⁴⁵ CAROLYN DEERE, *supra* note ____, at 167, see *id.*, at 167-72, 180-86. See also Peter Drahos, *BITS and BIPS: Bilateralism in Intellectual Property*, 4 J. World Intell. Prop. 791-808; PETER DRAHOS AND JOHN BRAITHWAITE, *INFORMATION FEUDALISM: WHO OWNS THE KNOWLEDGE ECONOMY?* (Earthscan, 2002); GRAHAM DUTFIELD, *INTELLECTUAL PROPERTY RIGHTS, TRADE AND BIODIVERSITY* (Earthscan 2000).

²⁴⁶ CAROLYN DEERE, *supra* note ____, at 172-79. See also Laurence Helfer, *Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INTERNAT'L L., 1 (2004)

²⁴⁷ CAROLYN DEERE, *supra* note ____, at 196-210. In Africa, this lack of expertise at the national level led to the delegation of intellectual property matters to regional entities that were particularly susceptible to high-protectionist pressures from WIPO and OECD countries generally. See *id.*, at 219-20

vulnerable to pressures from foreign governments.²⁴⁸ In many developing countries, parliamentary debate and public discussion about intellectual property issues were negligible, which left policy framing to “national associations of patent and trademark agents and copyright lawyers, staff of national intellectual property offices, and national legal scholars.”²⁴⁹ Weak governance and widespread corruption were, of course, ancillary factors in most of the developing world.²⁵⁰

One may then ask why matters should be different in the future. The answer is largely rooted in the real economic and technological capacities being attained in countries such as India, China, Brazil and others. Such real world experience breeds greater awareness of both the strengths and weaknesses of conventional intellectual property norms and policies encountered along the way and a greater confidence in the ability of local entrepreneurs and policy makers to tailor future decisions and positions in their national interest.²⁵¹ Of equal importance are the lessons to be learned from the coordination and governance strategies of those BRIC countries that have most succeeded in resisting foreign pressures for TRIPS-plus agreements and legislation while maintaining an increasingly autonomous policy of their own.²⁵² Also relevant is the continued ability of NGO advocacy initiatives, such as the Access to Knowledge Campaign,²⁵³ to reach policymakers in developing country capitals, despite funding cuts due to economic recession and to pressures from high-protectionist interests on foundations previously supportive of such initiatives.

A. Interagency Coordination of Intellectual Property Law and Policy

In the 1990s, under a seed grant from a unit of UNDP, Ruth Okediji, Jayashree Watal and Jerome Reichman argued that internal governmental coordination of intellectual property policy would be crucial to formulating appropriate domestic strategies to implement international intellectual property standards under the TRIPS Agreement.²⁵⁴ Because, in our view, these new IP standards would affect all of a country’s creative and industrial sectors in different ways, depending on its differing national assets and liabilities in each sector, there could be no internal “one size fits all solutions,” despite external pressures for such an approach. Rather, the challenge for governments was to take stock of those same national assets and liabilities and then to fashion implementing strategies that would

²⁴⁸CAROLYN DEERE, *supra* note ____, at 196-204.

²⁴⁹*Id.*, at 207.

²⁵⁰*See, e.g., id.*, at 198.

²⁵¹*See, e.g.,* Peter Yu (various studies); GORDON C.-K. CHEUNG, INTELLECTUAL PROPERTY RIGHTS IN CHINA – POLITICS OF PIRACY, TRADE AND PROTECTION, chapter 5: “Protecting IPR the Chinese Way”, pp. 63-82; (Routledge Contemporary China, 2009); Amy Kapczynski (counter-harmonization), *supra* note __; Minna Allarakhia, *supra* note __; Lea Shaver, *supra* note __. *See also* Shamnad Basheer & Annalisa Primi, *The WIPO Development Agenda: Factoring in the “Technology Proficient” Developing Countries, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA*, *supra* note __, 100-17; Pedro Paranaguá, *Strategies to Implement WIPO’s Development Agenda: A Brazilian Perspective and Beyond, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA*, *supra*, 140-57.

²⁵²*See, e.g.,* CAROLYN DEERE, *supra* note ____, at 199, 211-18.

²⁵³*See, e.g.,* Kapczynski, *supra* note __.

²⁵⁴*See* Reichman, Watal & Okediji, *Flagship Project on Innovation, Culture, Biogenetic Resources, and Traditional Knowledge*, UN Development Programme, 2000 (unpublished).

enable each developing country to maximize potential gains from intellectual property protection over time while minimizing the social costs.²⁵⁵

Our central recommendation was accordingly that developing country governments needed to form and staff ongoing interagency coordinating committees on intellectual property law and policy, in order to advise policymakers about the implications for economic and social welfare as a whole of every proposed legislative or administrative decision concerning compliance with the TRIPS Agreement and related issues.²⁵⁶ Above all, it seemed essential that these local coordinating committees would oversee the activities of national intellectual property offices, while pooling their resources at the regional level, in order to maintain coherent and effective positions in all the relevant multilateral fora, including WIPO, WTO, WHO, UNCTAD and UNESCO.²⁵⁷

To their credit, UNCTAD sponsored a Conference in Ghana at which some sixteen delegations from different countries evaluated these proposals.²⁵⁸ Notwithstanding attendant delegations' enthusiastic endorsement of these proposals, and UNCTAD's strong commitment to promote their implementation, further UNDP funding was denied. The project was soon abandoned, in part because some high-level UNDP officials thought that developing countries should work to repeal the TRIPS Agreement rather than to comply with it, and in part – one suspects – due to pressures on UNDP from key donor countries to steer clear of controversial intellectual property matters.

In retrospect, Carolyn Deere's empirical findings demonstrate the validity of the proposals for interagency coordination that were put forward in the mid-1990s and the extent to which such recommendations still remain relevant to today's counter-harmonization strategies including efforts to implement the WIPO Development Agenda. On the one hand, Deere's study shows that those BRIC countries that were most successful in defining and maintaining autonomous intellectual property policies and positions over time especially India and Brazil, despite enormous pressures from foreign governments, were precisely those countries that had highly developed interagency coordination mechanisms in place early on.²⁵⁹

With the exception of a handful of countries, like Brazil and India, the prospect of tailored approaches to TRIPS implementation was curtailed by the absence of a broader policy framework setting out national needs and priorities through which reform options could be considered... Among developing countries, Brazil stood out for having a strategic approach to TRIPS implementation based on a broad policy framework for development and associated industrial policies. India also worked to

²⁵⁵ *Id.* See also Maskus & Reichman, *Globalization of Private Knowledge Goods*, *supra* note ____; Margaret Chon, *supra* note ____.

²⁵⁶ See Reichman, Watal & Okediji, *supra* note ____.

²⁵⁷ Cf. most recently Peter K. Yu, *Building Intellectual Property Coalitions for Development*, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA, *supra* note ____, 79-99.

²⁵⁸ Cite UNCTAD docs. The Conference in Ghana was sponsored by UNDP Section and Technology Division of UNCTAD, then headed by Pedro Roffe.

²⁵⁹ CAROLYN DEERE, *supra* note ____, at 199-232.

place IP issues within a broader policy framework through its five-year plans.²⁶⁰

In contrast, most other governments delegated the task of responding to TRIPS and drafting the relevant laws to a small staff of technocrats located in national intellectual property offices.²⁶¹ Carried to the regional level in Africa, for example, this meant that national intellectual property policies were largely delegated to the African Intellectual Property Organization (OAPI) and to the African Regional Intellectual Property Organization (ARIPO) (English-speaking countries). Both entities worked closely with WIPO and left few countries at the national level with sufficient “capacity... to critically review patents granted,” among other policy issues.²⁶²

Of course, the successes attained in India, Brazil and China were also due to the economic opportunities their large markets offered to foreign investors, irrespective of their own intellectual property laws and policies.²⁶³ Nevertheless, it seems clear that, without effective interagency coordination of these issues at the domestic level, developing countries will not attain the leadership role in intellectual property policymaking at the international level to which they otherwise could and should aspire.

B. Establishing Facts on the Ground

The Development Agenda, now officially established at WIPO,²⁶⁴ and analogous forums at other institutions, such as the IGWG Deliberations at WHO²⁶⁵ and their progeny,²⁶⁶ have changed the policy climate at the international level. They elevate the concerns of

²⁶⁰ Id., at 199 (citations omitted)

²⁶¹ Id. See, e.g., UK Commission on Human Rights, *Integrating Intellectual Property Rights and Development Policy* (2002), available at http://www.iprcommission.org/papers/pdfs/final_report/CIPRfullfinal.pdf; Carlos Correa, *Formulating Effective Pro-Development National Intellectual Property Strategies*, in TRADING KNOWLEDGE: DEVELOPMENT PERSPECTIVES ON TRIPS, TRADE AND SUSTAINABILITY 2009-18 (Earthscan 2003).

²⁶² CAROLYN DEERE, *supra* note ___, at 215

²⁶³ See, e.g., Peter Yu, *supra* (in Gervais); Maskus.

²⁶⁴ [cite relevant WIPO docs] (The 45 Adopted Recommendations under the WIPO Development Agenda, available at <http://www.wipo.int/export/sites/www/ip-development/en/agenda/recommendations.pdf> ???); see, e.g., Jeremy De Beer, *Defining WIPO's Development Agenda*, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA, *supra* note ___, 1-23; Denis Borges Barbosa, Margaret Chon & Andres Moncago Von Hase, *Slouching towards Development in International Intellectual Property*, 17 MICH. ST. L. REV. 71-141 (2007).

²⁶⁵ Intergovernmental Working Group on Public Health, Innovation and Intellectual Property (IGWG) created in 2006; “Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property,” Sixty-First World Health Assembly, WHA 61.21, Agenda Item 11.6, May 24, 2008.

²⁶⁶ See, e.g., Draft global strategy and plan of action on public health, innovation and intellectual property: Mapping the funding for research and development for neglected diseases, A/PHI/IGWG/2/INF.DOC./2, 2008 available at: http://apps.who.int/gb/phi/pdf/igwg2/PHI_IGWG2_ID2-en.pdf). WHO, *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's Framework for Action* (WHO: Geneva, 2007), available at http://www.searo.who.int/LinkFiles/Health_Systems_EverybodyBusinessHSS.pdf; WHO, *Equitable Access to Essential Medicines: A Framework for Collective Action* (WHO: Geneva, 2004), <http://archives.who.int/tbs/ndp/s4962e.pdf>; Amy Kapczynski, *Innovation Policy for a New Era*, 37 J. LAW, MED. & ETHICS 2649 (2009).

developing countries, and the broader constituencies in developed countries whom they indirectly represent, to a level of importance that cannot be ignored.²⁶⁷ They make the implementation of the flexibilities set out in the TRIPS Agreement and in other intellectual property conventions as much a matter of legitimate multilateral concern as compliance with proprietors exclusive rights, in the sense that users' rights and other third party interests, including the larger public interest in research, education and access to knowledge, are an integral part of the relevant international intellectual property standards set out in these conventions.²⁶⁸ Moreover, by linking the larger development component to questions of enforcing intellectual property standards at the international level, the Development Agenda and IGWG-related consultations make it mandatory for both IGOs and national delegations to reconcile the implementation of international IPRS with the countervailing demands of human rights conventions²⁶⁹ and with the expressly designated objectives and principles codified in articles 7 and 8 of the TRIPS Agreement.²⁷⁰

Yet, nothing is cheaper than talk at IGOs. The prospects of top-down multilateral legislation mandating hard law provisions favoring the interests of developing countries are virtually nil at the present time, given the governance structure of these organizations and the hostility of the United States, European Union and Japan to any such initiatives. Whether soft law reforms stand a better chance of approval remains to be seen,²⁷¹ including the social costs of any trade-offs that would have to be made in order to win the assent of the aforementioned developed countries.²⁷²

²⁶⁷ See, e.g., Carolyn Deere, *Reforming Governance to Advance the WIPO Development Agenda*, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA, *supra* note ____, 43-56; Xuan Li, *A Conceptual and Methodological Framework for Impact Assessment under the WIPO Development Agenda*, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA, *supra* 34-42. See also F. Richard Gold & Sean-Frédéric Morin, *From Agenda to Implementation: Working Outside the WIPO Box*, in IMPLEMENTING THE WIPO AGENDA, *supra* 57, 64-66 ("Building a Network Aground WIPO").

²⁶⁸ See, e.g., Rochelle Cooper Dreyfuss, *Should Users Strike Back?*, *supra* note __; Henning Grosse Ruse-Kahn & Annette Kur, *Enough is Enough – The Notion of Ceilings in International Intellectual Property Protection*, Max Planck Institute for Intellectual Property, Competition and Tax Law Research Paper Series No. 09-01 (2008); Max Planck Declaration on the Three Step Test, *supra* note __; Hugenholtz & Okediji, *supra* note __.

²⁶⁹ See, e.g., Laurence Helfer, *Human Rights and Intellectual Property: Conflict or Coexistence?*, 5 MINNESOTA JOURNAL OF LAW, SCIENCE AND TECHNOLOGY, 47 (2003); Helfer, *Toward a Human Rights Framework for Intellectual Property*, 40 U.C. DAVIS LAW REVIEW, 971 (2007); see also JOOST PAUWELYN, *HUMAN RIGHTS AND INTERNATIONAL TRADE* (Oxford University Press, 2005); *Id.*, CONFLICT OF NORMS IN PUBLIC INTERNATIONAL LAW - HOW WTO LAW RELATES TO OTHER RULES OF INTERNATIONAL LAW (Cambridge University Press, 2003).

²⁷⁰ TRIPS Agreement, *supra* note ____, arts. 7-8; Peter K. Yu, *The Objectives and Principles of the TRIPS Agreement*, *supra* note __.

²⁷¹ See, e.g., Hugenholtz & Okediji, *supra* note __.

²⁷² For example, while expanded protection for Geographical Indications and Traditional Knowledge might become acceptable to both sides, proposals for database protection or deep patent law harmonization would almost certainly cost developing countries far more than any gains from greater recognition of so-called user rights. See, e.g., Reichman & Cooper Dreyfuss (2007), *supra* note __.

Meanwhile, secret provisions likely to be incorporated into the pending ACTA negotiations²⁷³ could undo key provisions of the Doha Declaration on the TRIPS Agreement and Public Health;²⁷⁴ E.U. customs officials are further undermining access to medicines by intercepting shipments of unpatented generic pharmaceuticals from India to developing countries in other continents.²⁷⁵ And WIPO has hosted a major conference to convince Least Developed Countries, such as Haiti, that their future development prospects depend on stronger intellectual property laws,²⁷⁶ which they are otherwise not obliged to enact until at least 2013.²⁷⁷

What must occur, instead, if the WIPO Development Agenda is to produce more than talk,²⁷⁸ is that leading developing countries, especially the BRIC countries, must take steps to implement model TRIPS-compliant flexibilities in their domestic laws, while championing these same positions in the relevant international fora. For example, nothing prevents Brazil, India and China from proceeding on their own to codify broad limitations and exceptions for scientific research, education and libraries in their domestic laws,²⁷⁹ as stepping stones to broader international action. By the same token, these and other countries could begin to legislatively implement the Max Planck Institute's Declaration on the Three Step Test in their domestic laws,²⁸⁰ along with selected other "ceilings" on intellectual property rights that have emerged from parallel initiatives in the Nordic countries.²⁸¹

Only if leading developing countries begin to enact suitable reforms of intellectual property law and policy at home will it become realistically possible to foresee these reforms spreading to the regional and multilateral levels, where the positive and negative results of these experiments can be evaluated. Inevitably, there will be both successes and failures, as states learn from each others' experiences over time. Just as the AIPPI forums in the nineteenth and early twentieth centuries shed a comparative light on state practice in developed countries and led to the progressive harmonization of inventors' rights over time,²⁸² so, too, can the WIPO Development Agenda become a focal point for

²⁷³ Cite ACTA (ACTA 5th Round of negotiation, available at : https://www.ige.ch/fileadmin/user_upload/Juristische_Infos/e/press_releases/press_release_5th_round_rabat_july_2009_e.pdf); McManis article HOUSTON L.J. (forthcoming).

²⁷⁴ Doha Declaration, *supra* note .

²⁷⁵ Latest IP Watch reproductions of cease and desist orders issued by Pharma; Fred Abbott, Legitimacy of this; IP Watch "Drug Seizures In Frankfurt Spark Fears Of EU-Wide Pattern" available at: <http://www.ip-watch.org/weblog/2009/06/05/drug-seizures-in-frankfurt-spark-fears-of-eu-wide-pattern/>).

²⁷⁶ IP-Watch article on this Conference

²⁷⁷ See *supra* note

²⁷⁸ See, e.g., Pedro Paranagua, *The WIPO Development Agenda: Another Still Birth? A Battle between Access to Knowledge and Enclosure*, available at http://papers.ssrn.com/5013/papers.com/abstracts_id=844366.

²⁷⁹ See, e.g., Reichman & Okediji, *supra* note ; Max Planck Declaration on the Three Step Test; cf. Andrew Rens, *Implementing WIPO's Development Agenda: Treaty Provisions for Minimum Exceptions and Limitations for Education*, in IMPLEMENTING THE WIPO DEVELOPMENT AGENDA, *supra* note , 155-69.

²⁸⁰ See Max Planck Declaration, *supra* note

²⁸¹ Kur & Grosse Ruse-Khan, *supra* note

²⁸² See STEPHEN LADAS, PATENTS, TRADEMARKS, AND RELATED RIGHTS: NATIONAL AND INTERNATIONAL PROTECTION, vol. 1, Harvard University Press (1975)

comparing and contrasting diverse state actions on the road to achieving a new and better equilibrium between private and public goods at the national, regional and multilateral levels.

Meanwhile, still other worthwhile initiatives can be rooted in state practice without formal acquiescence at IGOs. For example, there are now real prospects for an international treaty providing greater access to literature for the blind,²⁸³ a process that is long overdue and worthy of strong support by all WIPO member countries. At the same time, nothing stops the developing countries from immediately codifying key provisions of this proposed treaty in order to create “facts on the ground” that would benefit the blind and pave the way for easier enactment in the WIPO framework. Similarly, if a prize fund to promote research on a vaccine for Chagas disease is a good idea, as the evidence suggests,²⁸⁴ then the Latin American countries should establish such a fund now, with their own contributions, and shame the developed countries into joining them later. In other words, the more that the developing countries are willing to stand up for their own intellectual property needs, the likelier they are to ensure that those needs will be respected in future international intellectual property lawmaking exercises.

C. Defending the TRIPS Flexibilities at the WTO

Moving beyond talk will not become feasible unless developing countries are willing to defend their rights to implement the TRIPS flexibilities in their own domestic laws without undue interference from powerful states with conflicting interpretations of international IP standards. The more that single states, such as the BRIC countries, or regional coalitions, take steps to fully implement limitations and exceptions to the exclusive rights covered by the TRIPS Agreement, for example, the more likely it becomes that governments in developed countries will contest the legality of such actions through diplomatic representations and threats of retaliatory measures. For example, the United States Trade Representative (USTR) has repeatedly used actions under Section 301 of the Trade Act of 1974²⁸⁵ to challenge developing country governments’ interpretation of the TRIPS Agreement, in combination with threats to withdraw GSP privileges in reprisal.²⁸⁶ These actions have particularly inhibited developing countries from using the threat of compulsory licenses to persuade pharmaceutical companies to market patented medicines on a “high-volume low-margin” basis²⁸⁷ rather than at prices only the affluent can afford.²⁸⁸

²⁸³ Cite KEI proposed treaty, “WIPO Treaty for Improved Access for Blind, Visually Impaired and other Reading Disabled Persons” available at: http://www.keionline.org/misc-docs/tvi/tvi_en.html ; IP Watch, “Proposed WIPO Treaty On Visually Impaired Access Gets Deeper Look” available at: <http://www.ip-watch.org/weblog/2009/05/29/proposed-wipo-treaty-on-visually-impaired-access-gets-deeper-look/>

²⁸⁴ See, e.g., Sara E. Crager & Matt Price, *Prizes and Parasites: Incentive Models for Addressing Chagas Disease*, 37 J. LAW, MED. & ETHICS 292 (2009).

²⁸⁵ 19 U.S.C. §2411.

²⁸⁶ See cases of Brazil and Argentina (This year’s 301 Report is available at <http://www.ustr.gov/about-us/press-office/press-releases/2009/april/ustr-releases-2009-special-301-report>)

²⁸⁷ See, e.g., Robert C. Bird, *Developing Nations and the Compulsory License: Maximizing Access to Essential Medicines while Minimizing Investment Side Effects*, 37 J. LAW, MED. & ETHICS 209 (2009); Kristina M. Lybecker & Elizabeth Fowler, *Compulsory Licensing in Canada and Thailand: Comparing Regimes to Ensure Legitimate Use of the WTO Rules*, 37 J. LAW, MED., & ETHICS 222 (2009); Reichman,

Unless public officials in developing countries are willing to stand up for their rights under the TRIPS Agreement and related conventions before the Council for TRIPS²⁸⁹ and, where necessary, in WTO dispute-resolution proceedings,²⁹⁰ they will not retain the full policy space in which to maneuver that these conventions actually afford.²⁹¹ Conversely, governments that do stand up for such rights stand a good chance of persuading the WTO's Appellate Body that unilateral actions taken against them violate fundamental WTO precepts.

Article 23 of the WTO's Dispute Settlement Understanding (DSU) obliges Members to seek redress for alleged violations of the WTO Agreement, including its TRIPS component, by means of specified multilateral venues and procedures.²⁹² Under this provision, the U.S. authorities can challenge a developing country's interpretation of its TRIPS obligations by initiating litigation before a dispute settlement panel, with a right of appeal to the WTO Appellate Body. But USTR cannot unilaterally adjudicate disputes over matters covered by the TRIPS Agreement, nor can it legally impose sanctions for the loss of expected trade benefits.²⁹³ Freedom from unilateral action of this kind is one major reason that developing countries signed onto the 1994 Agreement Establishing the WTO in the first place.²⁹⁴

In 1999, a WTO panel convoked by the European Union officials criticized the United States for unilaterally applying Section 301 to TRIPS-related matters and it warned that

Compulsory Licensing of Patented Pharmaceutical Inventions, *supra* note _____. See generally F. M. Abbott & J.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 (2007). See generally B. C. Mercurio, *TRIPS, Patents, and Access to Life-Saving Drugs in the Developing World*, 8 MARQUETTE INTEL. PROP. REV. 211 (2004); Kevin Outterson, *Pharmaceutical Arbitrage: Balancing Access and Innovation in Pharmaceutical Prescription Drug Markets*, 5 YALE J. HEALTH POL., LAW & ETHICS 193 (2005).

²⁸⁸For the economic logic of this strategy, see Flynn, Hollis, & Palmedo, *supra* note _____.

²⁸⁹See TRIPS Agreement, *supra* note _____, art. 68; WTO Framework Agreement (Role of Council for TRIPS).

²⁹⁰Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU), April 15, 1994, 33 I.L.M. 1226 (1994), available <http://www.worldtradelaw.net/uragreements/dsu.pdf>.

²⁹¹See Reichman, *Evaluating the Options*, *supra* note _____, at 258 (discussing cases of Brazil and Thailand). Cf. Peter K. Yu, *Access to Medicines, BRICs Alliances, and Collective Action*, 34 AM. J. L. & MED. 345 (2008).

²⁹²DSU, *supra* note _____, art. 23.1.

²⁹³USTR has revoked the Generalized System of Preferences (GSP) privileges against several Latin American countries in the past (notably Argentina and Brazil), and it has threatened Thailand with similar actions (cites). See, e.g., Abbott & Reichman, *supra* note _____ at 980-81. Because GSP concessions are voluntary, and not bound under the General Agreement on Tariffs and Trade (GATT 1994), they may normally be revoked at will. However, revoking GSP privileges as retaliation for a unilaterally determined violation of a TRIPS obligation would seem to violate both the letter and spirit of art. 23 of the DSU. Accord: TREBILCOCK AND HOWSE, *THE REGULATION OF INTERNATIONAL TRADE*, Routledge, New York, 3rd edition, 2005.

²⁹⁴UNCTAD, *Resource Book on TRIPS and Development: An authoritative and practical guide to the TRIPS Agreement*, UNCTAD-ICTSD (Cambridge Univ. Press, New York, 2005).

sanctions would be in order if such violations continued in the future.²⁹⁵ Moreover, if developed countries continue to engage in unilateral retaliations of this sort, they run the further risk of other countervailing measures that aggrieved countries could invoke:

Because such action constitutes a violation of the DSU and of the Framework Agreement Establishing the WTO, it would entitle the aggrieved party to all the remedies that the Vienna Convention on the Law of Treaties provides for breach of the relevant agreements. A primary remedy thus provided is the age-old right of self-help implicit in the power of an aggrieved party to suspend its obligations under the treaty in question, pending compensation for breach.²⁹⁶

Developing countries that win dispute-settlement cases against developed countries may also invoke cross-collateral trade sanctions in the event that damages based on sanctions against imports of knowledge goods alone were insufficient to cover the actual trade losses caused by the defendant country's violations of the WTO Agreements.²⁹⁷

Those developing countries willing to defend their interpretations of the TRIPS Agreement before WTO dispute-settlement panels have already made significant contributions to our understanding of international intellectual property law. For example, in the very first WTO TRIPS case concerning a dispute between the U.S. and the E.U. on one side, and India, on the other, the Appellate Body, while finding against India on the merits, rejected the interpretation put forward by the plaintiffs.²⁹⁸ Instead, the Appellate Body stressed the need for considerable deference to the manner in which states undertook good faith implementation of TRIPS obligations within their domestic legal systems, in keeping with article 1.1 of the TRIPS Agreement itself.²⁹⁹

More recently, in a dispute about the enforcement of intellectual property rights between China and the U.S., the panel's decision on the merits went both ways, depending on the specific issues.³⁰⁰ Nevertheless, as Professor Dreyfuss points out, the panel gave China

²⁹⁵ WTO Panel Report, United States—Sections 301-310 of the Trade Act of 1974, WT/DS152/R (Dec. 22, 1999). At the time, USTR promised to mend its ways.

²⁹⁶ Reichman, *Expanding the Options*, *supra* note ___, at 259; *see* Vienna Convention on the Law of Treaties, 1155 UNTS 331, 8 I.L.M. 679 (1969), art. 60.

²⁹⁷ *See, e.g.*, Resource Book, *supra* note ___; case of Antigua, Grosse Ruse-Khan, *A Pirate of the Caribbean? The Attractions of Suspending TRIPS Obligations*, JOURNAL OF INTERNATIONAL ECONOMIC LAW, Vol. 11, 2, pp. 313-364 (2008); Abbott, ICTSD (2009).

²⁹⁸ Appellate Body Report, India-Patent Protection for Pharmaceutical and Agricultural Chemical Products, WT/DS50/AB/R (Dec. 19, 1997) [hereinafter *India Pharmaceuticals*].

²⁹⁹ *India Pharmaceuticals*, *supra* note ___, ¶¶ 46,59; TRIPS Agreement, *supra* note ___, art. 1.1. ("Members shall be free to determine the appropriate method of implementing the provisions of this Agreement within their own legal system and practice"). *See* Jerome H. Reichman, *Securing Compliance with the TRIPS Agreement after U.S. v. India*, 1 JIEL 585, 594-97 (concluding that "[d]eference to local law and strict construction of treaties have thus become the pedestal on which the Appellate Body's TRIPS jurisprudence rests"). *See also* Dreyfuss, *The Role of India, China, Brazil and Other Emerging Economies in Establishing Access Norms for Intellectual Property and Intellectual Property Lawmaking*, IILJ Working Paper Working Paper 2009/05, at 15-18.

³⁰⁰ Panel Report, China – Measures Affecting the Protection and Enforcement of Intellectual Property Rights, WT/DS362/R (Jan. 26, 2009) [hereinafter *China Enforcement of IP*]

“extensive leeway to determine how to dispose of infringing goods and where to set the threshold for criminal enforcement,” while stressing that “TRIPS is a *minimum* standards regime ... that gives members freedom to determine the most appropriate method of implementing their obligations.”³⁰¹ Professor Dreyfuss thus predicts that greater participation of the emerging countries in the WTO adjudication process would likely push both panels and the Appellate Body to more carefully scrutinize the balancing factors favoring developing country interests that are already built into the TRIPS Agreement than has so far occurred in cases where the only antagonists are developed-country Member.³⁰²

D. Concluding Observations

While much of the recent literature continues to focus on two fundamental tenets of the high-protectionist rhetoric, namely that stronger IPRs necessarily lead to more innovation and transfer of technology and that they are essential for attracting FDI,³⁰³ other studies have demonstrated that technology exporters need access to emerging Asian and Latin American markets as much as these countries need FDI, licensing, and up-to-date high-tech goods.³⁰⁴ So long as the general level of IP protection in emerging markets 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, excessive pricing, territorial restraints on outputs, and other restrictive business practices that suitable competition laws and policies could help to resolve³⁰⁵ than from gaps or inadequacies in local intellectual property laws, although the weak enforcement of IP laws may have detrimental affects on both local and foreign producers.³⁰⁶ Meanwhile, innovative firms benefiting from a pro-competitive environment in developing countries can also profit from high-protectionist IP regimes abroad—under the independence of patents doctrine³⁰⁷—without aping the protectionist excesses of those regimes.

As Keith 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

³⁰¹ Dreyfuss, *The Role of India, China, Brazil*, *supra* note ___ at 16; *China Enforcement of IP*, *supra* note ___, ¶¶ 7.236, 7.331, 7.507, 7.602. The panel also tightened the evidentiary requirements and methodology for measuring damages, while avoiding speculative harm, in contrast to an earlier panel decision concerning a copyright dispute between the E.U. and the U.S. *See id.*, at 16 (citing authorities).

³⁰² Dreyfuss, *The Role of India, China, Brazil* (2009), *supra* note ___, at 17.

³⁰³ *See supra* notes ___ and accompanying text. *See also* Gervais, *supra* note ___; Yu, *supra* note ___ (citing authorities); Gordon C.K. Cheung, *supra* note ___, 39-62.

³⁰⁴ *See* Yu, *supra* note ___; Daniel Chow, *Counterfeiting in the Peoples' Republic of China*, 78 WASHINGTON U. L. QUARTERLY (2000). *See generally* Keith Maskus, *Transfer of Tech*, DUKE J. COMPAR. L.

³⁰⁵ *See supra* notes ___ and accompanying text.

³⁰⁶ *See e.g.*, Gordon C.K. Cheung, *supra* note ___; Daniel Chow, *supra* note ___.

³⁰⁷ *See* Paris Convention for the Protection of Industrial Policy (1883), revised at Stockholm (1967), art. 4bis.

protection may add little to either FDI or economic growth in its own right.³⁰⁸ Moreover, as the relations between IPRs and innovation in knowledge economies become better scrutinized, the proper role of IPRs as such in overall development policies remains far less clear and more complex than the IP literature normally recognizes.³⁰⁹ Policies favoring the formation of research commons, as well as open access to knowledge initiatives, may become as important in the BRIC countries, especially for sustainable upstream knowledge outputs, as strategic reliance on exclusive rights to stimulate downstream commercial applications of basic research.³¹⁰ Unless these countries actively adapt the TRIPS' flexibilities to their own development needs, with a view to maximizing the benefits and minimizing the social costs of harmonized international IP standards,³¹¹ 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."³¹²

Against this background, 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 increasingly failed to address.³¹³ To the extent that these emerging economies 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 to intellectual property law 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;³¹⁴ and to stimulate a vigorous and concerted debate about the proper design of those institutions.

Legal circles in the emerging economies will also have to study and master the relevant WTO jurisprudence, as the Japanese have done,³¹⁵ in order to steer clear of obvious legal obstacles and to defend national autonomy at the TRIPS Council or, when necessary, in

³⁰⁸ Keith E. Maskus, *Intellectual Property Rights in the Global Economy* (Institute for Int'l Economics 2000)

³⁰⁹ 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, *supra* note

³¹⁰ See, e.g., REICHMAN DEDAEURWAERDERE & UHLIR, *DESIGNING THE MICROBIAL COMMONS*, *supra* note ___; Janet Hope, *Open Source Genetics: Conceptual Framework*, in *GENE PATENTS AND COLLABORATIVE LICENSING MODELS*, *supra* note ___, 171-93; Alessandro Octaviani, *Biotechnology in Brazil: Promoting Open Innovation*, in *Access to Knowledge*, *supra* note ___ 127-57; Mina Allarkhia I&II. See generally BENKLER, *WEALTH OF NETWORKS*,

³¹¹ See Reichman, *From Free Riders to Fair Followers*, *supra* note

³¹² Robert L. Ostergard Jr., *supra* note ___ at

³¹³ Accord: Dreyfuss, *The Role of India, China, Brazil*, *supra* note ___.

³¹⁴ See, e.g., Pedro Nicolletti Mizukami, Ronaldo Lemos, Bruno Magrani & Carlos Afonso Pereira de Souza, *Exceptions and Limitations to Copyright in Brazil*, in *ACCESS TO KNOWLEDGE IN BRAZIL*, *supra* note ___, 62, 105-15. See, e.g., Pedro Nicolletti Mizukami, Ronaldo Lemos, Bruno Magrani & Carlos Afonso Pereira de Souza, *Exceptions and Limitations to Copyright in Brazil: A Call for Reform*, in *ACCESS TO KNOWLEDGE IN BRAZIL*, *supra* note ___, 62, 105-15.

³¹⁵ Remarks by [Visiting Professor from Japan] Duke Law School

actual dispute-settlement cases. These countries should also avoid further multilateral and bilateral standard-setting negotiations likely to 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.³¹⁶ Above all, more developing countries need 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.³¹⁷

From a broader perspective, any uniquely developing country effort to fashion appropriate intellectual property regimes for the twenty-first century must necessarily seek a new equilibrium between public and private goods. Because the last half of the twentieth century was so consumed with conflicts between public-centered and private-centered economies, insufficient thought was given to evaluating the proper and ever-evolving interrelationship between private and public goods, which the rise of knowledge economies has made so critically important.³¹⁸ In this context, Joseph Stiglitz' call to recognize the role of "knowledge as a global public good"³¹⁹ has generated an important literature whose practical implementation should become a primary goal of forward looking policy in all developing countries.³²⁰

Developing countries should also 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),³²¹ while resisting legal, economic and technological restraints on the dissemination of such data.³²² A particularly forward looking policy would, for example, lead these countries to support open access and other sharing mechanisms at the level of scientific enquiry,³²³ while taking steps to better ensure downstream support for innovative applications flowing from cooperative public-private upstream research initiatives.³²⁴

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

³¹⁶ See Maskus & Reichman, *supra* note ; Reichman & Cooper Dreyfuss, *supra* note

³¹⁷ See *supra* text accompanying notes ____.

³¹⁸ See Maskus & Reichman, *supra* note . See generally Peter Drahos, *The Regulation of Public Goods, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note , 46-64.

³¹⁹ Joseph Stiglitz, *Knowledge as a Global Public Good, in* see *supra* note

³²⁰ See e.g., UNESCO, TOWARD A KNOWLEDGE SOCIETY; STIGLITZ, DOSI & CIMOLI, INDUSTRIAL POLICY, see *supra* note ____; IDS Task force on IP, title? (forthcoming 2010); UNDP I & II.

³²¹ See, e.g., NAS Publication re cooperation with China

³²² See *supra* notes and accompanying text Jerome H. Reichman & Paul Uhlir, *Global Trends to Restrict Access to Scientific Data from Government Funded Research*, paper presented at Yale University Conference on Global Information Flows, April 2-4, 2005 (last revised June 21, 2007).

³²³ See, e.g., Anthony So et al, *supra* note ____

³²⁴ See, e.g., John Willbanks, *Science Commons License for the Exchange of Data*, paper presented at the Communin? Conference, University of Turin, Turin, Italy, June __, 2009; Pedro Nicoletti Mizukami & Ronaldo Lemos, *From Free Software to Free Culture: The Emergence of Open Business, in* ACCESS TO KNOWLEDGE IN BRAZIL, *supra* note __, 25-59.

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.³²⁵

To be sure, charting one's own course is never easy, especially when powerful countries and knowledge cartels apply countervailing pressures at every step. Nevertheless, I continue to believe that, with enlightened leadership, buttressed by "skillful lawyering, political determination and coordinated planning,"³²⁶ the intellectual property institutions inherited from the Industrial Revolution can evolve into a worldwide system of innovation that will benefit countries at every stage of economic development.

³²⁵ Reichman & Cooper Dreyfuss, *supra* note , at

³²⁶ Abbott & Reichman *supra* note , at