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Richard Lillich Memorial Lecture: Nurturing a Transnational System of Innovation

Jerome H. Reichman
Duke University School of Law

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RICHARD LILLICH MEMORIAL LECTURE: NURTURING A TRANSNATIONAL SYSTEM OF INNOVATION

JEROME H. REICHMAN*

I. INTRODUCTION

At a College of Europe Workshop[1] in 2007, I was asked to elaborate on the idea that what really emerged from the World Trade Orangization's ("WTO") Agreement on Trade-Related Aspects of Intellectual Property law ("TRIPS Agreement")[2] in 1994 was "an incipient transnational system of innovation." [3] This idea was initially put forward in an article that Keith Maskus and I published in our book about the growing tendency of multilateral intellectual property negotiations to disrupt the capacity of nation states to maintain the supply of such critical public goods as education, public health, environmental safety, and scientific re-

 Bunyan S. Womble Professor of Law, Duke University School of Law, Durham, North Carolina. An earlier version of this article appeared in INTELLECTUAL PROPERTY, PUBLIC POLICY AND INTERNATIONAL TRADE, 17-41 (Inge Govaere & Hanns Ullrich eds., 2007).

1. College of Europe, Workshop on Issues of Public Policy and Trade in Intellectual Property Law, Bruges, Belgium, Oct. 5, 2005.

2. Agreement on Trade-Related Aspects of Intellectual Property Rights, Including Trade in Counterfeit Goods, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, Apr. 15 1994, 33 I.L.M. 1154 [hereinafter TRIPS Agreement].

3. Keith E. Maskus & Jerome H. Reichman, *The Globalization of Private Knowledge Goods and the Privatization of Global Public Goods, in* INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED INTELLECTUAL PROPERTY REGIME 3, 33-41 (Keith E. Maskus & Jerome H. Reichman eds., 2005). [hereinafter INTERNATIONAL PUBLIC GOODS AND IP].

search.[4] In the present article, I will summarize some of the main themes from our previous work and focus attention on the difficulties of nurturing a transnational system of innovation that could properly balance the needs of states at different levels of economic development.

Part I identifies some of the paradoxes that have emerged from overzealous efforts to re-regulate the global economy, in order to make it safe for investors in the production of knowledge goods, despite the long-standing drive of trade policy to deregulate that same economy in the name of free competition. Part II discusses the governance deficiencies that currently frustrate the need to balance public and private interests at the multilateral level.

Part III focuses on specific problems of maintaining the supply of knowledge as a global public good[5] in the face of the high-protectionist ethos driving current trade policy and of the governance problems identified in Part II. Part IV concludes with a warning about the risks of succumbing to a dogmatic intellectual property ideology precisely at a moment when history beckons state actors to engage in open-minded experimentation with promising new technologies and with new legal tools to promote their development and widespread diffusion.

II. REGULATORY PARADOXES OF THE NEW GLOBAL ECONOMY

Let me first point out that, in an effort to promote trade in knowledge goods, we have paradoxically and energetically been re-regulating the global economy in ways that contradict the sixty-year historical mission of the General Agreement on Tariffs and Trade (GATT).[6] That mission was precisely to deregulate the global economy in the interest of free competition.[7]

I find it disconcerting that "free traders" acquiesce so readily in this process of re-regulation, without critically examining the premise that ever-expanding intellectual property rights must enhance global economic welfare. One high-level governmental study, and many reputable intellectual property scholars, have ques-

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4. *See generally* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3.

5. *See, e.g.*, J.E. Stiglitz, *Knowledge as a Public Good, in* GLOBAL PUBLIC GOODS: INTERNATIONAL COOPERATION IN THE 21ST CENTURY (I. Kaul et al., eds., 1999).

6. Multilateral Agreements on Trade in Goods, Apr. 15 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 33 I.L.M. 1154 [hereinafter GATT 1994].

7. *See, e.g.*, John H. Jackson, *GATT and the Future of International Trade Institutions*, 28 BROOK J. INT'L. L. 11 (1992).

tioned the wisdom behind this high-protectionist agenda.[8] Professor Thomas Dreier's thoughtful comments on this and related topics also reflect growing concerns about ever-expanding intellectual property rights, at least with regard to the border with competition law.[9] Nevertheless, the notion that more intellectual property protection necessarily translates into more innovation has been so successfully promoted in recent years that few trade economists even bother to ask whether multiplying legal monopolies may not hamstring innovation and competitive enterprise in the end.

When the GATT was adopted, the prevailing norm at the international level was that intellectual property rights represented islands of protection in a sea of free competition. Those islands were largely left to the domestic laws, which, however, were subject to norms of reasonableness and necessity under Article XX(d) of the GATT 1947.[10] This provision expressly ordained that domestic intellectual property laws should not become disguised barriers to trade.[11]

In contrast, when one reviews the massive amounts of intellectual property legislation that characterize the post-TRIPS model at every level, it seems more accurate to speak of islands of competition in a sea of legal monopolies. It is at best unclear who represents the larger public interest[12] in negotiating forums dominated by powerful multinational firms that behave increasingly like a

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8. *See, e.g.*, Commission on Intellectual Property Rights (CIPR), *Integrating Intellectual Property Rights and Development Policy* 8, 21-27 (2000) [hereinafter CIPR]; Carlos M. Correa, *Internationalization of the Patent System and New Technologies*, 20 WIS. INT'L. L.J. 523, 544-50 (2002); John. H. Barton, *The Economics of TRIPS: International Trade in Information Intensive Products*, 33 GEO. WASH. INT'L L. REV. 473 (2001); Ruth L. Okediji, *Public Welfare and the Role of the WTO: Reconsidering the TRIPS Agreement*, 17 EMORY INT'L L. REV. 819 (2003); James Boyle, *A Manifesto on WIPO and the Future of Intellectual Property*, DUKE L. & TECH. REV. 9 (2004). For an insightful review and analysis of this literature, *see* Margaret Chon, *Intellectual Property and the Development Divide*, 27 CARDOZO L. REV. 2821 (2006).

9. *See* Thomas Dreier, *Shaping a Fair International IPR-Regime in a Globalized World—Some Parameters for Public Policy*, *in* INTELLECTUAL PROPERTY, PUBLIC POLICY, AND INTERNATIONAL TRADE 43-75 (Inge Govaere & Hanns Ullrich eds., 2007).

10. *See* GATT 1994, *supra* note 6, at art. XX(d), carrying forward original article XX(d) in GATT 1947.

11. *See* GATT 1994, *supra* note 6, at art. XX, *chapeau* clause, disallowing measures that constitute "a disguised restriction on international trade" (carrying forward same language from GATT 1947).

12. For a discussion of the ambiguities inherent in the term "public interest," *see* Dreier, *supra* note 9, who correctly observes that IPRs are given birth as an expression of the public interest in creativity and innovation. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3, did not equate the larger public interest with consumer access to knowledge or knowledge goods as such, although it is one component of a broader equation. Nor do we equate the broader public interest with "the sum total of private interests." That, indeed, is why we chose to focus on the "privatization of global public goods."

"knowledge cartel."[13] This process has been dramatically evidenced in the recent Free Trade Negotiations, where the United States Trade Representative (USTR) directly espouses the interests of the pharmaceutical and entertainment industries, among others, in securing provisions that sometimes exceed what is permitted by congressionally enacted U.S. laws.[14]

Yet, there is reason to fear that the members of this "knowledge cartel" are more interested in "lock[ing] in temporary competitive advantages" from existing innovation than in formulating measures that would advance "the global public interest in [future] innovation, competition, or the provision of complementary public goods."[15] This one-sided drive to re-regulate the global economy thus produces distortions to trade that can impede worldwide economic growth in the long term.

For example, re-regulation can disrupt the transfer of technology under market conditions by allowing dominant firms to refuse to deal with would-be competitors in developing countries or to demand such increased rent extraction for up-to-date technology (based on immunities from reverse-engineering under TRIPS) that the welfare gains from technology installation are lost. Moreover, the same intellectual property standards that impede reverse-engineering also hinder local manufacturers' efforts to add value and improvements to the existing technological base.[16]

"Without a legitimizing governance process that adequately represents all stakeholders," Maskus and I fear that a re-regulated global market will "reflect dubious practices in developed markets for knowledge goods that may actually hamper both innovation and competition in the long run."[17] There is a "further risk that an over-regulated market for knowledge goods could compromise the

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13. *Id.* at 19. *See also* John. Barton, *Integrating IPR Policies in Development Strategies, in* TRADING IN KNOWLEDGE (C. Bellman et al., eds., 2003) (stressing difficulties of entry into markets "dominated by multinational oligopolies" that are "compounded by the international IP system").

14. *See* Frederick M. Abbott, *Intellectual Property Rights in a Global Trade Framework: Trends in Developing Countries*, 98 AM. SOC'Y OF INT'L L. Proceedings 95, 97 (2004); Graham Dutfield, *North/South: An Assymetric Global Market?*, paper presented at the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), Parma, Italy, 9-11 September 2006.

15. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 19.

16. *See, e.g.*, Carlos M. Correa, *Can the TRIPS Agreement Foster Technology Transfer to Developing Countries?, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 227-56; Lee G. Branstetter, *Do Stronger Patents Induce More Local Innovation?, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 309-20.

17. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 20.

ability of nation states to supply other public goods that only they can provide in a decentralized world economy."[18]

Beyond the potential negative effects on innovation, the drive for ever stronger international IP standards is also disrupting the provision of other key public goods that are essential components of global public welfare, such as education, public health, environmental protection, food, security, scientific research, and competition.[19] Increasingly, the knowledge inputs needed to promote these public goods are subject to exclusive property rights, and they are made available at high prices or on terms and conditions that render it difficult for ministries to provide essential public goods at the national level. Yet, these ministries were usually not represented at the negotiating forums where international intellectual property standards were set; and in these forums, there has been little regard to the impacts of intellectual property rights on the provisions of global public goods generally.

III. BALANCING PUBLIC AND PRIVATE INTERESTS IN AN INCIPIENT TRANSNATIONAL SYSTEM OF INNOVATION

Maskus and I concede that an "incipient transnational system of innovation" could enable successful innovators in all countries[20]—developed or developing—to reach an integrated world market.[21] If one believes that carefully calibrated intellectual property rights provide needed incentives to invest in risky forms of innovation, the public benefits likely to accrue from scientific

18. *Id.* at 20. *See generally* PROVIDING GLOBAL PUBLIC GOODS: MANAGING GLOBALIZATION (I. Kaul et al., eds., 2003); SUSAN K. SELL, PRIVATE POWER, PUBLIC LAW: THE GLOBALIZATION OF INTELLECTUAL PROPERTY RIGHTS (Cambridge University Press 2003).

19. *See*, e.g. 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 IP, *supra* note 3 at 81-120; Ruth Okediji, *Sustainable Access to Copyrighted Digital Information Works in Developing Countries, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 142-87; Frederick M. Abbott, *Managing the Hydra: The Herculean Task of Ensuring Access to Essential Medicines in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 393-424; Hans Ullrich, *Expansionist Intellectual Property Protection and Reductionist Competition Rules: A TRIPS Perspective, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 726-57.

20. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 33-35 (stressing that "[a]ll countries could benefit from a functionally efficient transnational system of innovation if low barriers to entry enabled entrepreneurs anywhere to invest in the production and distribution of knowledge goods.").

21. *See, e.g.*, Asish Arora, Andrea Fosfuri & Alfonso Gambardella, *Markets for Technology, Intellectual Property Rights and Development, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 321-336; *see also* Michael Blakeney, *Stimulating Agricultural Innovation,* in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 367-390; Keith E. Maskus, Kamal Saggi & Thitima Puttitanum, *Patent Rights and International Technology Transfer Through Direct Investment and Licensing, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 265-80.

and technological progress under such a worldwide system are potentially incalculable.[22]

There are serious obstacles to achieving such progress, however. In practice, the different national and regional capabilities and endowments of WTO Members limit their absorptive capacities and reduce the potential benefits of open markets for knowledge goods. This "technological divide" is widened by the high rents that must now be paid to technology exporters and by the absence of provisions conferring differential and more favorable treatment on developing countries under the TRIPS Agreement,[23] even though that principle had been enshrined in the GATT (1947) at the end of the Tokyo Round in 1979.[24] The only differential treatment under TRIPS is now reserved for Least-Developed Countries (LDCs), the poorest of the poor, whose general compliance obligations have just been extended to 2013 (in addition to further exemptions for the patenting of pharmaceutical products until 2016).[25]

Disregarding the LDCs, all other developing countries—whether they fall in the high, medium, or low income brackets—must accordingly compete in markets for knowledge goods on roughly the same normative terms and conditions that govern advanced industrialized countries. A growing number of these developing countries have demonstrated considerable capacity in some technological fields, and some are beginning to challenge the technological supremacy of the OECD countries.[26] Nevertheless, all of

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22. *See, e.g.*, M. P. Ryan, *Useful Knowledge and the Development Agenda Debate at WIPO*, paper presented at the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), Parma, Italy, 9-11 September 2006. However, some commentators believe that many developing countries should focus on comparative advantages in agriculture and other local endowments, rather than technological innovation. *See, e.g.*, Dreier, *supra* note 9.

23. *See* TRIPS Agreement, *supra* note 2, art. 65 (Transitional Arrangements).

24. *See* GATT (1947), *supra* note 6, Part IV, "Results of the Uruguay Round — Legal Texts" 533-37 (1994).

25. *See* TRIPS Agreement, *supra* note 2, arts. 65-66; World Trade Organization, Ministerial, Doha Declaration on the TRIPS Agreement and Public Health, WTO Doc. WT/MIN(01)/DEC/W/2, 14 November 2001 [hereinafter Doha Declaration on Public Health], A7; Decision by the Council for TRIPS of 27 June 2002, Extension of the Transition Period under Article 66.1 of the TRIPS Agreement for Least-Developed Country Members for Certain Obligations with respect to Pharmaceutical Products Council for Trade-Related Aspect of Intellectual Property Rights, WTO Doc. IP/C/25, (July 1, 2002) [hereinafter Decision on the 2016 Extension]. LDCs may postpone implementation of other TRIPS obligations, including the duty to provide patent protection for products other than pharmaceuticals, until 2013. *See* Decision by the Council for TRIPS of 29 November 2005, Extension of the Transition Period under Article 66.1 for Least-Developed Country Members, WTO Doc. IP/C/40 (Nov. 30, 2005) [hereinafter Decision on the 2013 Extension]. During these transition periods, LDCs must continue to respect national treatment and most-favored-nation (MFN) obligations under arts. 3-4 of the TRIPS Agreement, *supra* note 2.

26. *See, e.g.*, J. Straus, *The Impact of GATT and TRIPS on Economic Development*,

them are struggling to cope with the enormous challenges and burdens, including financial burdens, thrust upon them by a universal set of relatively high intellectual property standards.[27]

These burdens and challenges affect even those developing countries that are not actively engaged in the production of knowledge goods. Such countries must nonetheless organize and maintain the defense of foreign intellectual property owners, with serious repercussions for their internal ability to meet, say, public education and public health goals at prices their general populations can afford.[28]

In other words, even developing countries that opt out of the world's innovation "tournaments" must engage in burdensome efforts to cope with the social costs of world intellectual property norms, including the distributional inequities that poverty greatly magnifies. They must cope, with varying degrees of success, with the so-called "flexibilities" built into the TRIPS Agreement itself, which could, if mastered, potentially lower those same social costs.[29] Increasingly, developing countries must also deal with official and unofficial pressures and threats to provide higher TRIPS-plus levels of intellectual property protection, which may become embodied in bilateral or regional Free Trade Agreements.[30]

When, instead, developing countries opt into the production of knowledge goods for local consumption or export purposes, they face an even more complex and burdensome "balancing act." On the one hand, they must internalize universal IP norms in ways that stimulate relevant industrial sectors having innovative poten-

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paper presented to the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), Parma, Italy, 9-11 September 2006 (stressing successes of China and India). *See also* Dutfield, *supra* note 14 (predicting shift in terms of knowledge goods trade to detriment of current technology exporters).

27. *See generally* CIPR, *supra* note 8. *See also* Chon, *supra* note 8 at 2839-58 (criticizing intergovernmental efforts and scholarly analysis of IP problems as insufficiently grounded in development theory and practice).

28. *See, e.g.*, Okediji, *supra* note 19; Abbott, *supra* note 19. *See also* Timothy Swanson & Timo Goeschl, *Diffusion and Distribution: The Impacts on Poor Countries of Technological Enforcement Within the Biotechnological Sector, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 669-94.

29. For detailed discussion of these flexibilities, *see generally*, U.N. CONFERENCE ON TRADE & DEV. (UNCTAD) AND INTERNATIONAL CENTER FOR TRADE AND SUSTAINABLE DEVELOPMENT (ICTSD), RESOURCE BOOK ON TRIPS AND DEVELOPMENT (2005). *See also* Jerome H. Reichman, *From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement*, 29 NYU J. INT'L. L. & POL. 11 (1997); Carolos M. Correa, *Formulating Effective Pro-Development National Intellectual property Policies, in* TRADING IN KNOWLEDGE, *supra* note 13 at 209 *et seq.* For discussion of distributional effects, *see, e.g.*, Peter M. Gerhart, *Distributive Values and Institutional Design in the Provision of Global Public Goods, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 69-77.

30. *Supra* note 14.

tial without, however, legally discriminating against foreign competitors. The national treatment principle of the TRIPS Agreement[31]—which the WTO Appellate Body has deemed a cardinal premise of the worldwide intellectual property system[32] —thus reinforces the lack of "differential and more favorable treatment" in that same Agreement.

This formidable challenge is then made considerably more difficult by the countervailing welfare goals these countries must also meet, for political reasons, among others, with respect to, say, public health and public education. Here, in short, even economically dynamic developing countries must resolve tensions between calibrating TRIPS-compliant domestic IP norms to stimulate innovation and adjusting the same set of norms to provide access to knowledge and medicines on affordable terms and conditions.[33] These efforts are reflected, for example, in India's new patent law, where efforts to stimulate the research-based pharmaceutical sector increasingly conflict with efforts to preserve the well-developed capacity of local producers to supply low-cost generic drugs to both domestic and foreign consumers.[34]

More generally, the TRIPS Agreement has thus obliged developing countries to engage in a delicate balancing act between stimulating the production of private knowledge goods, when feasible, and maintaining the supply of essential public goods.[35] Public international law, however, affords them little guidance in choosing normative and practical tools for achieving this balance. Rather, the relentless drive to privatize knowledge goods, which has picked up even more steam in bilateral and regional FTAs since TRIPS (despite implicit promises to the contrary during the Uruguay Round), has been accompanied by no comparable collective action at the intergovernmental level to preserve and coordinate the supply of global public goods. This governance gap persists despite a growing clamor for such initiatives by NGOs en-

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31. TRIPS Agreement, *supra* note 2, arts. 3 & 4.

32. United States-Section 211 Omnibus Appropriations Act of 1998 (*Havana Club*), January 2, 2002, DSR 2002: II 589, WTO Doc. WT/DS176/AB/R.

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

34. *See, e.g.*, J. M. Mueller, *The Tiger Awakens: The Tumultuous Transformation of India's Patent System and the Rise of Indian Pharmaceutical Innovation* (draft version, August, 2006), University of Pittsburg School of Law Working Paper Series, Working Paper no. 43 at http://law.bepress.com/pittlwps/papers/art 43; Janis M. Mueller, *Taking TRIPS to India—Novartis, Patent Law, and Access to Medicines*, 356 NEW ENGLAND J. MEDICINE 54 (Feb. 8, 2007).

35. For deep conceptual issues, *see* Peter Drahos, *The Regulation of Public Goods, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3, at 46-64.

gaged in "regime shifting" tactics[36] and by the so-called "Friends of Development," who have sought to prod the World Intellectual Property Organization (WIPO) in new, more development-friendly directions.[37]

Indeed, we have no trusted governance mechanism for balancing public and private interests in this emerging transnational system of innovation at all.[38] We lack clear theoretical premises or empirical evidence to determine which intellectual property standards would best promote diverse goals over time.[39] We have generated few ideas, and little discussion about how to maintain the supply of other global public goods — including knowledge itself — under a supra-national intellectual property regime.[40] And we have not even begun to acknowledge the need to deal with adverse distributional impacts, especially on the poor, that even the most carefully balanced intellectual property regime may produce.[41]

IV. MAINTAINING THE SUPPLY OF KNOWLEDGE AS A GLOBAL PUBLIC GOOD

In the rest of this article, I focus primary attention on the topic of innovation itself, and particularly its dependence on the continued upstream availability of knowledge as both a domestic and a global public good. Joseph Stiglitz, the Nobel Prize winner, has written brilliantly on this general concept.[42] Moreover, recent efforts to focus attention on both human rights and human welfare in the context of overall development goals has added new and welcome dimensions to the debate about international IPRs.[43]

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36. *See generally* L. R. Helfer, *Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L L. 1 (2004).

37. *See infra* note 52; for details, *see* Chon, *supra* note 8 at 2844-49 (citing authorities).

38. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 18-20.

39. *See generally* Jerome H. Reichman & R. Cooper Dreyfuss, *Harmonization without Consensus: Critical Reflections on Drafting a Substantive Patent Law Treaty*, 57 DUKE L.J. 85 (2007).

40. *See, e.g.*, Jane C. Ginsberg, *Toward Supranational Copyright Law?, The WTO Panel Decision and the "Three Step Test" for Copyright Exceptions*, 187 REVUE INTERNATIONALE DU DROIT D'AUTEUR 3, January 2001 *available at* SSRN: http://ssrn.com/abstract=253867; Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 27-33, 41-45; *see generally* P. Drahos, *supra* note 35 at 46-68.

41. *See, e.g.*, Gerhart, *supra* note 29; Chon *supra* note 8.

42. *See generally* Stiglitz, *supra* note 5.

43. *See, e.g.*, Chon, *supra* note 8 at 2859-909 (stressing access to knowledge as key to capacity building); Helfer, *supra* note 33. *See also* Peter K. Yu, *Reconceptualizing Intellectual Property Interests in a Human Rights Framework*, Mich. St. Univ. C. of L., Legal Studies Research Paper Series, Paper No. 04-01, 2006, *available at* http://ssrn.com/abstract=927335.

Nevertheless, these approaches should not deflect attention from more specific needs to devise an economically stable innovation system potentially of benefit to all countries, even if they raise searching questions about distributive justice and larger developmental goals that cannot be ignored.

For present purposes, I wish to underscore the extent to which today's high protectionist agenda progressively tends to compromise the availability of knowledge inputs needed for future innovation by expanding the protection of contemporary outputs as if there were no tomorrow.[44] This short-sighted approach threatens to disrupt the delicate "ecology of information" that James Boyle has eloquently portrayed.[45]

A fundamental problem is that international trade negotiations have not self-consciously postulated the need to seek intellectual property norms and incentives that would best advance the incipient worldwide system of innovation as such.[46] On the contrary, special interest lobbyists claiming to know what best serves that system have promoted normative solutions that maximize rents from existing innovation. These self-serving IP proposals are then exchanged for trade concessions in other areas that may or may not advance the long-term interests of the technology importing countries.[47]

This linkage methodology first evolved in the 1980s, when a Cold War political stalemate had blocked the progressive harmonization of rudimentary international IP standards at WIPO, and countries at very different levels of development were unwilling to exchange purely IP concessions as such. Once a more robust transnational IP system had been installed on the shoulders of the

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44. *See, e.g.*, Michael A. Heller & Rebecca. S. Eisenberg, *Can Patents Deter Innovation? The Anti-commons in Biomedical Research*, 280 SCIENCE 690 (1998); James Boyle, *The Second Enclosure Movement and the Construction of the Public Domain*, 66 L. & CONTEMP. PROBS. 33 (2003); Arto K. Rai, *Fostering Cumulative Innovation in the Biopharmaceutical Industry: The Role of Patents and Antitrust*, 16 BERKELEY TECH. L.J. 813 (2001); Paul A. David, *A Tragedy of the Public Knowledge "Commons? Global Science, Intellectual Property and the Digital Technology Boomerang*, SIEPR Discussion Paper No. 00-02, Stanford Inst. for Economic Pol'y Research (2000), *available at* http://siepr.stanford.edu/papers/pdf/00-02.html (last visited Jan. 8 2004).

45. James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net*, 47 DUKE L.J. 87 (1997).

46. *See, e.g.*, JAYASHEE WATAL, INTELLECTUAL PROPERTY RIGHTS IN THE WTO AND DEVELOPING COUNTRIES (2001); Susan K. Sell, *Trade Issues & HIV/AIDS*, 17 EMORY INT'L L. R. 591 (2003); Peter K. Yu, *TRIPS and Its Discontents*, 10 MARQ. INTELL. PROP. L. REV. 369 (2006). *See generally* G. H. Evans, *The Making of the Agreement on Trade-Related Aspects of Intellectual Property Rights*, 18 WORLD COMPETITION 137-180 (1994).

47. *See, e.g.*, Suzanne Scotchmer, *The Political Economy of Intellectual Property Treaties*, 20 J. L. ECON. & ORG. 415 (2004) (showing that these agreements seek to capture positive externalities and spillovers from existing innovation).

TRIPS Agreement, however, continued reliance on this linkage methodology has undermined the stability of that very system by blinding negotiators to the cumulative social costs of unbalanced, over-protectionist IP regimes even in the most advanced economies.

Respectable economic inquiry has never been more perplexed and uncertain about the potential hazards of our ever-expanding, ever more protectionist intellectual property regimes.[48] Nor have serious efforts been made to reconcile the private and public interests of countries at different levels of development, with a view to optimizing global welfare in a healthy competitive environment.[49] Indeed, in some countries, especially the United States, even the word "competition" has become suspect under an antitrust law that increasingly views monopoly as a socially desirable tool to promote research and development.[50] Yet, those who cling to this pessimistic Schumpetarean outlook largely ignore, or at least under-appreciate, the extent to which so much of today's basic research is performed at government expense in universities and other government-funded entities. The very success of this growing public-private partnership in technological innovation[51] could instead justify a greater degree of competition in downstream applications and improvements than was previously thought economically desirable.

While a group of developing countries has recently called for sustained economic analysis of these questions at the international level,[52] the most powerful countries' trade negotiators relentlessly

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48. *See, e.g.*, ADAM B. JAFFE & JOSH LERNER, INNOVATION AND ITS DISCONTENTS: HOW OUR BROKEN PATENT SYSTEM IS ENDANGERING INNOVATION AND PROGRESS AND WHAT TO DO ABOUT IT (Princeton University Press 2004); David, *supra* notes 19 & 44; Keith E. Maskus, *Lessons from Studying the International Economics of Intellectual Property Rights*, 52 VAND. L. REV. 2219 (2000); Yochai Benkler, *An Unhurried View of Private Ordering in Information Transactions*, 53 VAND. L. REV. 2063 (2000).

49. CIPR, *supra* note 8; Branstetter, *supra* note 16; *see also* Ullrich, *supra* note 19 at 726-57.

50. *See, e.g.*, J. Drexl, *Intellectual Property Rights as Constituent Elements of the Market Order*, paper presented to the Annual Meeting of the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), Parma, Italy, September 9-11 2006; Eleanor M. Fox, *Can Antitrust Policy Protect the Global Commons from the Excesses of IPRs?*, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 758-69; *see also* S. Ghosh, *Comment: Competitive Baselines for Intellectual Property in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 793-814.

51. *See, e.g.*, DAVID MOWERY ET AL., IVORY TOWER AND INDUSTRIAL INNOVATION: UNIVERSITY-INDUSTRY TECHNOLOGY BEFORE AND AFTER THE BAYH-DOLE ACT (Stanford University Press 2004).

52. *See* WIPO General Assembly, Proposal by Argentina and Brazil for the Establishment of a Development Agenda for WIPO, WIPO Doc. WO/GA/31/11, 27 August 2004; Proposal to Establish a Development Agenda for WIPO: An Elaboration of Issues Raised in Document WO/GA/31/11, WIPO Doc IIM/1/4, 6 April 2005; Proposal by Morocco on Behalf of

seek to export their increasingly dysfunctional intellectual property systems to the rest of the world at the very time when those systems are in danger of breaking down at home.[53] If these trends continue unabated, the poorly designed intellectual property mechanisms forged in bilateral and multilateral forums could stifle rather than accelerate the pace of innovation in the emerging transnational system.

We ignore, for example, the extent to which low eligibility standards and dubious conceptual formulations have flooded technology markets with weak patents that generate thickets of rights and other blocking effects, which in turn shift funds away from R&D into wasteful litigation and other counter-measures.[54] We ignore the spreading tentacles of copyright law, which have made truly creative expression ever more difficult by narrowing user and public-interest safeguards,[55] and which have surrounded computer programs and other functional works with impenetrable legal and technological fences.[56] We risk elevating the costs of R&D across entire economies through database protection laws so poorly designed[57] that they have embarrassed both the highest court called

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the African Group Entitled *The African Proposal for the Establishment of a Development Agenda for WIPO*, WIPO Doc IIM/3/2, 18 July 2005. *See also* S. Musungu & G. Dutfield, Multilateral Agreements and a TRIPS-Plus World: The World Intellectual Property Organization (WIPO), (QUNO/QIAP), TRIPS Issues Paper 3, 2003; C. L. Deere, *What Next for the Development Agenda at WIPO? Priorities for 2006*, BRIDGES, ICTSD, February 2006.

53. *See, e.g.*, Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 20-23 (citing authorities); Reichman & Dreyfuss, *Patent Law Harmonization*, *supra* note 39.

54. *See supra* note 39; Jaffe & Lerner, *supra* note 48; B. Verbeure et al., *Patent Pools and Diagnostic Testing*, 24 TRENDS IN BIOTECHNOLOGY 115 (2006); Geertrui Van Overwalle et al., *Models for Facilitating Access to Patents on Genetic Inventions*, 7 NATURE REVIEW GENETICS 143 (2006); J. Warloin, The Tsunami of Biotech Patents, paper presented to the International Workshop on Gene Patents and Clearing Models: From Concepts to Cases, Catholic University, Leuven, Belgium, 8-10 June 2006.

55. *See, e.g.*, 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 TECHNOLOGY L.J. 98 (2007). *See also* R. Cooper Dreyfuss, *TRIPS — Round II: Should Users Strike Back*, 71 U. CHI. L. REV. 21 (2004). Ruth L. Okedigi, *Sustainable Access to Copyrighted Digital Information Works in Developing Countries*, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3, 142-87.

56. *See, e.g.*, Dreier, *supra* note 9; Pamela Samuelson, Ramdall Davis, Mitchell.D. Kapr & Jerome H. Reichman, *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2203 (1994); Jerome H. Reichman & Johnathan A. Franklin, *Privately Legislated Intellectual Property Rights: Reconciling Freedom of Contract with Public Good Uses of Information*, 147 U. PA. L. REV. 875 (1999); Dan L. Burk, *Anticircumvention Misuse*, 50 UCLA L. REV. 1095 (2003).

57. *See* Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the Legal Protection of Databases, O.J. (1996) L 77/20; Jerome H. Reichman and Pamela Samuelson, *Intellectual Property Rights in Data?*, 50 VAND. L. REV. 51 (1997); Jerome H. Reichman, *Database Protection in a Global Economy*, REVUE INTERNATIONALE DE DROIT ÉCONOMIQUE, 455 (2002).

to enforce them[58] and even the legislative entity that spawned them.[59] And we continue to roll out competition laws and policies that claim to advance innovation — as if that were not sufficiently the province of IPRs — rather than to reign in anticompetitive arrangements that limit both the diffusion of innovation and the pace of improvements.[60]

Professor Dreier rightly reminds us that the advent of new technologies requires some adjustments of pre-existing IP paradigms and that allowing users and consumers to free-ride on investments in such technologies would also constitute a short-sighted policy resulting in market failure.[61] But few, if any, reputable scholars endorse such policies. The scarecrow of free-riding has become a political gambit to steer legislators away from softer modalities of protection that could overcome market failure with lower social costs and without unnecessarily impeding future innovation.[62]

A. Rationalizing the Protection of Cumulative and Sequential Innovation

Professor Dreier has called attention to special problems posed by information technologies and biotechnology, in which each new advance seems to depend upon a mix of preceding innovative contributions. This phenomenon is, indeed, the problem of "cumulative and sequential innovation," which I have addressed in a number of monographs and articles.[63]

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58. *See, e.g.*, Case C-203/02, British Horse-racing Board Ltd v. William Hill Organization, Ltd., 2004 E.C.R. I-10415; Case C-46/02, Fixtures Marketing Ltd. v. Oy Veikkaus AB, 2004 E.C.R. I-10365.

59. Commission of the European Communities, First Evaluation of Directive 96/9/EC on the Legal Protection of Databases, DG Internal Market and Services working paper, Brussels, Dec. 12, 2005, http://europa.eu.int/comm/interval/market/copyright/docs/databases/evaluationreporten.pdf. *But see* Estelle Derclaye, *IPRs on Information and Market Power: Comparing the European and American Protections of Databases*, paper presented to the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP), Parma, Italy, September 9-11, 2006 (advocating European approach with certain modifications).

60. *See* Drexl, supra note 50; Fox, *supra* note 50; Ullrich, *supra* note 19; *see also* M.D. Janis, *"Minimal" Standards for Patent-Related Antitrust Law Under TRIPS, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 774-792.

61. Dreier, *supra* note 9. *See also* James Boyle, *Enclosing the Genome: What Squabbles Over Genetic Patents Could Teach Us, in* PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT 97-118 (F. Scott Kieft ed., Elsevier Academic Press 2003).

62. Jerome H. Reichman, *Saving the Patent Law from Itself, in* PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT, *supra* note 61 at 289-301.

63. *See* Dreier, *supra* note 9; Jerome H. Reichman, *Of Green Tulips and Legal Kudzu: Repackaging Rights in Subpatentable Innovation* 53 VAND. L. REV. 1743 (2002); Jerome H.

Traditional patent law presupposes clear boundaries between non-obvious inventions, and it proceeds on the assumption that the initial inventor is best-equipped to develop the new product or process and bring it to market in an efficient manner. The powerful exclusive rights of the patent paradigm rest upon both these premises and make it possible for innovators to exchange their creations for value in the absence of market failure.[64]

In reality, the conditions of present-day technological innovation increasingly contradict and confound these premises.[65] When patents are freely granted for merely incremental additions to the knowledge stock, as routinely occurs under today's low eligibility requirements, innovations clustering around common technical trajectories overlap, with no clear proprietarial lines of demarcation.[66] These proliferating patents then give rise to thickets of rights that produce blocking effects on both follow-on innovation and upstream basic research.[67] Scarce resources needed for R&D are progressively diverted to litigation seeking judicial clarification of boundary lines that are inherently blurred by definition.[68]

Meanwhile, the pace of innovation is further slowed because exclusive property rights in "slivers of innovation" act as a barrier to entry to those who must use existing inventions to produce value-adding improvements.[69] Experience with small-scale innovation in different fields suggests that the market often discerns the course of improvements faster than the initial innovator, and that would-be competitors would move quickly to invest in value-adding improvements but for the potential blocking effects of the first-comer's exclusive rights. Exchange often fails to occur because the second comers fear to disclose small-scale applications of know-

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Reichman, *Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2342 (1994).

64. *See, e.g.*, Edmund Kitch, *The Nature and Function of the Patent System* 20 J. L. & ECON. 265 (1997); Edmund Kitch *Elementary and Persistent Errors in the Economic Analysis of Intellectual Property*, 53 VAND. L. REV. 1737 (2000); Robert P. Merges, *One Hundred Years of Solitude: Intellectual Property Law, 1900-2000*, 88 CAL. L. REV. 2187, 2225-27 (2000).

65. *See, e.g.*, James Bessen & Michelle Meurer, *Lessons for Patent Policy from Empirical Research on Patent Litigation*, 9 LEWIS & CLARK L. REV. 1 (2006); Rai, *supra* note 44; Heller & Eisenberg, *supra* note 44; Dan L. Burk & Mark A. Lemley, *Biotechnology's Uncertainty Principle, in* PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT, *supra* note 61 at 325-53.

66. *See* Bessen & Meurer, *supra* note 65; *see also supra* note 54.

67. *See, e.g.*, Burk & Lemley, *supra* note 65 at 339-353; Rebecca S. Eisenberg, *Reaching Through the Genome, in* PERSPECTIVES ON PROPERTIES OF THE HUMAN GENOME PROJECT, *supra* note 61 at.209-30; Heller & Eisenberg, *supra* note 41.

68. Cf., e.g. W. Kingston, *An Agenda for Radical Intellectual Property Reform, in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 653-61.

69. *See* Reichman, *Saving the Patent Law from Itself*, *supra* note 62.

how to the initial innovator and cannot proceed to deliver value-adding improvements without incurring the risk of actions for infringement.[70] The domestic patent laws, and their *sui generis* counterparts, thus clumsily impede the pace of innovation because of a well-intentioned aim to immunize the first-comers from free-riding appropriations of their initial investments in R&D.

From a broader perspective, the forgoing analysis shows the dominant Cosean model, in which rational actors contract around strong and clearly defined exclusive property rights,[71] to be at war with two pre-existing subsystems on which competitive economies traditionally depended. One such subsystem was the set of liability rules that governed trade secrets in the past, especially when patents were hard to obtain because of high eligibility standards, and routine engineers could freely provide value-adding improvements by reverse-engineering the technical know-how embodied in sub-patentable innovation.[72] The second major subsystem undermined by a mindless expansion of exclusive property rights was the Mertonian model of open access and sharing of scientific research results, which provided a continuous flow of upstream knowledge inputs often funded by government science agencies.[73] It also complicates the evolution of promising new innovation models based on voluntary forms of coordinated collective action.[74]

From a theoretical perspective, I have elsewhere argued that policymakers should be exploring and experimenting with novel intellectual property regimes that could defend cumulative and sequential innovation against free-riding appropriators without unduly blocking value-adding improvements and without depriving first-comers of a fair share of the revenues from such improvements. To this end, a set of "take and pay" liability rules, known as a "compensatory liability regime," can be fashioned to regulate the pace of improvements while impeding wholesale duplication of pro-

70. *See* Reichman, *Green Tulips*, *supra* note 63 (discussing Arrow's Information Paradox).

71. *See* Rober P. Merges, *Of Property Rules, Coase, and Intellectual Property*, 94 COLUM. L. REV. 2655 (1994).

72. *See* Reichman, *Legal Hybrids*, *supra* note 63.

73. *See, e.g.*, Arti Kaur Rai, *Evolving Scientific Norms and Intellectual Property Rights: A Reply to Kieff*, 95 NW. U. L. REV. 707 (2001); Jerome H. Reichman & Paul F. Uhlir, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, 66 L. & CONTEMP. PROBS. 317 (2003); Graeme B. Dinwoodie & R. Cooper Dreyfuss, *Patenting Science: Protecting the Domain of Accessible Knowledge*, *in* THE FUTURE OF THE PUBLIC DOMAIN: IDENTIFYING THE COMMONS IN INFORMATION LAW 191-221 (Lucie Guibault & P. Bernt Husgenholtz eds., Kluwer Law International 2006) [hereinafter *Patenting Science*].

74. *See, e.g.*, Yochai Benkler, *Coase's Penguin or Linnux and the Nature of the Firm*, 102 YALE L. J. 369 (2002); *see also* GLYN MOODY, REBEL CODE: LINUX AND THE OPEN SOURCE REVOLUTION (Perseus Books Group 2002).

tected small-scale innovation.[75] This alternative form of protection would provide *ex ante* entitlements to promote value-adding uses of cumulative and sequential innovation with low transaction costs and fewer barriers to entry, and it would also avoid many of the coordination problems that frustrate the collective action needed for complex innovative undertakings.[76]

This is not the place to explore such proposals in detail. I mention them here because they attempt to address the problems that an increasingly dysfunctional intellectual property system has elicited. Many other ambitious proposals are on the table, such as open-source initiatives, patent pools, science commons and other clearing house models,[77] which merit investigation and study. Yet, all these worthwhile responses to the pressing problems of the day could be compromised if the knowledge cartel that has captured the international IP law-making process continues to ratchet up ever-more protectionist standards in the name of so-called "harmonization."

B. A Moratorium on Stronger International Intellectual Property Standard-Setting Exercises

The forgoing discussion suggests that the last thing that an incipient transnational system of innovation needs at the moment are additional rounds of international IP law-making exercises. On the contrary, the developing countries need a breathing space in which to accommodate the social costs of the TRIPS Agreement (and posterior TRIPS-plus agreements, if any). They must particularly master the nuances of existing international standards of protection, including both built-in and subsequently added flexibilities, with a view to adapting this legal infrastructure to their own assets, needs and capabilities.[78] At the same time, policymakers in

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75. Reichman, *Green Tulips*, *supra* note 63; *see also* Jerome H. Reichman & Tracy Lewis, *Using Liability Rules to Stimulate Local Innovation in Developing Countries: Application to Traditional Knowledge*, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 337-66.

76. *See,* Tom Dedeurwaerdere, A Philosopher's View, paper presented to the International Workshop on Gene Patents and Clearing Models: From Concepts to Cases, Catholic University, Leuven, Belgium, 8-10 June 2006.

77. YOCHAI BENKLER, THE WEALTH OF NETWORKS: HOW SOCIAL PRODUCTION TRANSFORMS MARKETS AND FREEDOM (2006); JANET HOPE, OPEN SOURCE BIOTECHNOLOGY (forthcoming 2008); *see generally* papers presented to the International Workshop on Gene Patents and Clearing Models: From Concepts to Cases, Catholic University, Leuven, Belgium, 8-10 June 2006.

78. *See, e.g.*, Dutfield, *supra* note 14; *see generally* Mueller *supra* note 34 (for an in-depth survey of India's struggle to reconcile international patent standards with its own development goals); *see also* Abbott & Reichman, *supra* note 33 (discussing potential impact of amended TRIPS provision 31*bis*).

developed countries need to step back and take stock of their growing intellectual property predicaments, without worsening existing problems by further succumbing to the "more is always better" propaganda of a powerful knowledge cartel.

For all these reasons, Keith Maskus and I have called for a moratorium on intellectual property standard-setting exercises for the immediate future. In our view, "further harmonization is not an improper goal, but rather a premature exercise under the new and uncertain conditions that attend the development of cutting-edge technologies generally and information-based technologies in particular."[79]

Professor Dreier correctly understands our proposal to be directed at developed and developing countries alike.[80] Our hope is that, as states at different levels of development "accommodate[d] existing international [IP] standards to their own nascent or evolving systems of innovation," a body of fresh empirical data would emerge with which to compare and test different development strategies.[81] In the long run, such data might make it more feasible for states to trade further intellectual property concessions once again, "on a win-win basis, without coercion and with fewer risks that powerful interest groups had rigged the rules to lock in fleeting competitive advantages."[82]

If developing countries (whose interests vary greatly according to per capita GDP and industrial capacities) rallied around the call for such a moratorium, it could help them collectively resist bilateral pressures in FTA negotiations that have so far succeeded on a "divide and conquer" strategy. These countries should, however, remain willing to consider minimalist, good faith responses to new or rampant free-riding practices that might unexpectedly emerge during the moratorium period.[83]

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79. Maskus & Reichman in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3, at 36. *See also*, Reichman & Cooper Dreyfuss, *supra* note 39.(For efforts to bolster the recognition of foreign judgments obtained under IP laws already conforming to TRIPS standards, *see*, Jane C. Ginsberg, & R. Cooper Dreyfuss, *Draft Convention on Jurisdiction and Recognition of Judgments, in* INTELLECTUAL PROPERTY MATTERS, 77 CHI.-KENT L. R. 1065 (2002); Yoav Ostreicher, *The Rise and Fall of the "Mixed" and "Double" Convention Models Regarding Recognition and Enforcement of Foreign Judgments*, 6 WASH. U. GLOBAL STUD. L. REV. 338 (2007).

80. *See* Dreier, *supra* note 9.

81. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 37; *see also* Reichman & Cooper Dreyfuss, *supra* note 39.

82. Maskus & Reichman, *in* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 37.

83. For example, certain rampant forms of free-riding on digital sound recordings might require a positive response, in the spirit of TRIPS, even if not clearly covered by treaty obligations. By the same token, had developing countries been willing to consider

C. New Institutional Initiatives

While both the European Commission and the European Patent Office[84] have recently demonstrated greater awareness of the dangers of extending IP protection in the absence of solid economic justification, there is no sign that either USTR or the administration will reduce pressures currently being exerted to stiffen intellectual property standards in multilateral, regional, and bilateral forums.[85] Accordingly, if a healthy worldwide system of innovation is to emerge in the post-TRIPS environment, the need for a proper balance of public and private interests within that system is factually dependent on the developing countries' ability to resist the drive to re-regulate the world economy. Important in this regard was the WIPO Development Agenda,[86] and other parallel initiatives, such as the Access to Essential Medicines[87] and Access to Knowledge[88] campaigns, whose mission it is to document developing country complaints about how they may be ill-served by TRIPS and TRIPS-plus standards of IP protection.

At the same time, we need more reliable information about how IPRs may be helping the developing countries, especially in certain fields and at certain levels of per capita GDP.[89] In so doing, it is important to take account of the different conditions affecting different industrial sectors in these countries. For example, while a stronger patent regime has certainly caused problems for Brazil's public health program,[90] that country has become a major innova-

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early U.S. proposals for compensatory fees for access to clinical trial data, they might have avoided the imposition of tough exclusive rights regimes in recent FTAs. *See, e.g.,* Jerome Reichman, *The International Legal Status of Undisclosed Clinical Trial Data: From Private to Public Goods?, in* NEGOTIATING HEALTH: INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES, EarthScan, (Pedro Roffe et al. eds., 2006) [hereinafter Negotiating Health].

84. *See Interviews for the Future*, European Patent Office, 2006.

85. *See, e.g.,* Abbott, *supra* note 14.

86. *See, supra* note 52.

87. *See, e.g., Access to Essential Medicines Campaign*, Doctors Without Borders, http://www.accessmed-msf.org; Karin Timmermans, *Ensuring Access to Medicines in 2004 and Beyond,* in NEGOTIATING HEALTH, *supra* note 83 at 41-54; Frederick M. Abbott, *Managing the Hydra: The Herculean Task of Ensuring Access to Essential Medicines* in INTERNATIONAL PUBLIC GOODS AND IP 393-424, *supra* note 3.

88. *See, e.g., CPTech, Draft Treaty on Access to Knowledge*, 9 May 2005, available at http://www.cptech.org.

89. *See, e.g.,* Mueller, *supra* note 34 (case of Indian pharmaceutical industry); Straus, *supra* note 26; Michael P. Ryan, *Brazil's Quiet Bio-Medical Innovation Revolution: Drugs, Patents, and the '10/90 Health Research Gap,'* Creative and Innovative Economy Center Research Paper (2006), *available at* http://www.law.gwu.edu/Academics/CIEC/Research+Papers.htm; *see also* Ryan, *supra* note 22.

90. *See, e.g.,* Mirta Levis, *Role, Perspectives and Challenges of the Generic Pharmaceutical Industry in Latin America, in* NEGOTIATING HEALTH, 55-63, *supra* note 83; *see also* Barbara Rosenberg, *Market Concentration of the Transnational Pharmaceutical Industry and the Generic Industries: Trends on Mergers, Acquisitions and Other Transactions, in*

tor and exporter in the aircraft industry and, allegedly, in the biomedical sector as well.[91] IPRs may have played a positive role in both cases.

Similarly, some Indian and Chinese pharmaceutical companies are reportedly well-positioned to benefit from universal patent norms, even if many smaller Indian firms may be denied prior opportunities to reverse-engineer cheap generic drugs.[92] Ideally, our quest for reliable empirical studies of what actually transpires in developing countries should enable scholars and policymakers better to differentiate the situations in low and middle-income countries from those at a more advanced state of industrialization.[93]

Because today's most scientifically and commercially valuable knowledge goods are likely to be products of cumulative and sequential innovation, all countries — not just developing countries — need norms that reinforce the natural sharing ethos of public science and that expand the semi-commons of nonpatentable or subpatentable ideas and know-how accessible to routine engineers.[94] To this end, the developing countries in particular need to embrace a pro-competitive ethos by strengthening their capacities and technologies of reverse-engineering.[95] They need to experiment with new intellectual property models, including those based on open-source solutions and on the strategic use of liability rules, which can cure market failures without impeding follow-on innovation and without creating barriers to entry.

Above all, developing countries need to formulate suitable competition law rules and policies (hopefully coordinated) to ensure that foreign technologies and know-how flow to local markets at prices local entrepreneurs can afford. In so doing, they should also make use of competition law exceptions in the TRIPS-Agreement

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NEGOTIATING HEALTH, 65 & 73-75, *supra* note 83.

91. *See supra* note 89.

92. *See, e.g.*, Mueller, *supra* note 34; Timmermans, *supra* note 87 at 50-53. *See also* Joan Rovira, *Creating and Promoting Domestic Drug Manufacturing Capabilities: A Solution for Developing Countries?, in* NEGOTIATING HEALTH, 227-40, *supra* note 83.

93. *See generally* KEITH E. MASKUS, INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY (Institute for International Economics 2000); Phillip McCalman, *Reaping What You Sow: An Empirical Analysis of International Patent Harmonization*, 55 *J INT'L ECON.* 161 (2001); Maskus, *Lessons, supra* note 48, at 2224-39.

94. *See supra* text accompanying notes 63-76; *see also* R. Cooper Dreyfuss & G. Dinwoodie, *WTO Dispute Resolution and the Preservation of the Public Domain of Science Under International Law* in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3 at 861-883 (providing innovative proposals); Marianne Levin & Annette Kur, *Towards More Balanced, User Friendly Paradigms in IP Law: A Project to Reform TRIPS*, Special Session: the *IP in Transition Research Programme* presented to the International Association for the Advancement of Teaching and Research in Intellectual Property (ATRIP) conference in Parma, Italy, (Sep. 5, 2006) (providing innovative proposals).

95. *See supra* note 29.

to obtain bulk access to educational and scientific texts at prices the local educational community can afford.[96]

Ideally, all developing countries should experimentally be testing different approaches to stimulating and disseminating innovation in their national and regional systems of innovation and to defining the relevant supporting legal standards that could prove effective for different players at different levels of development, all of whom are necessarily operating within the incipient transnational system of innovation. Valid experiments of this kind should eventually lead to bottom up proposals for future intellectual property standards that are demonstrably consistent with development goals and that suitably reconcile public and private interests at national, regional and, ultimately, global levels.[97]

Another overarching goal for developing countries is to experiment with new techniques, strategies and institutions for maintaining the supply of knowledge as a public good. While this dimension was painfully ignored during the multilateral trade negotiations that gave birth to the TRIPS Agreement, governments in the most technologically advanced countries clearly understand the importance of funding basic research and the need to provide critical upstream inputs for groundbreaking scientific research, which the private sector cannot sustain. [98] Yet, one of the biggest defects of multilateral and bilateral standard-setting exercises, without public interest negotiators seated at the table, is precisely the emergence of a one dimensional normative infrastructure that can make the provision of the public good side of innovation ever harder and more costly.[99]

In this regard, we must particularly ensure that developing countries are connected to the worldwide flow of scientific and technical information, in what UNESCO calls the drive for "knowledge societies,"[100] a goal that will require restraints on electronic fencing of disembodied information.[101] We will need better research exemptions to all intellectual property regimes. We must

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96. *See, e.g.*, Drexl, *supra* note 50; Correa, *supra* note 29; Ullrich, *supra* note 19; Okediji, *supra* note 19.

97. *See, e.g.*, Dreyfuss & Dinwoodie, *supra* note 94; Levin & Kur, *supra* note 94.

98. *See, e.g.*, Arti K. Rai & Rebecca S. Eisenberg, *Bayh-Dole Reform and the Progress of Biomedicine*, 66 L. & CONTEMP. PROBS. 289 (2003).

99. *See e.g., Patenting Science, supra* note 73; Pamela Samuelson, *Mapping the Digital Public Domain: Threats and Opportunities*, 66 L. & CONTEMP. PROBS. 147 (2003).

100. *See Towards Knowledge Societies*, UNESCO WORLD REPORT (UNESCO Publishing 2005).

101. *See* Jerome H. Reichman, Paul F. Uhlir, & Heather Ritch, *Access to Scientific and Technological Knowledge: UNESCO's Past, Present and Future Roles, in UNESCO,* SIXTY YEARS OF STANDARD-SETTING IN EDUCATION, SCIENCE AND CULTURE (2007).

ensure that both government-funded and government-generated scientific research results are widely disseminated at affordable costs.[102] And we need to encourage developing countries to invest wisely in forms of public-private cooperation that focus on capacity building in universities and on the transfer of both innovative capacity and technology from the public to the private sectors.

In so doing, we must also take pains to distinguish problems of distributive injustice from problems directly dependent on IPRs. While these issues are often interrelated, Peter Gerhart's recent work shows that we have not thought enough about how developed countries cope with distributional aspects "behind the scenes," and why this absence of secondary coping mechanisms magnifies the social costs of IPRs in developing countries.[103]

Finally, looking beyond innovation as such, we must find ways to ensure that progress in stimulating the production of knowledge goods leads to the support of other public goods, such as public health, agriculture, the environment, education and scientific research generally. In other words, we must reverse the trend that makes the globalization of private knowledge goods increasingly at odds with the provision of global public goods, and instead take steps to ensure that the emerging transnational system of innovation adequately fosters and supports the supply of both, in an environment that remains responsive to basic human needs and fundamental human rights.[104]

V. CONCLUDING REMARKS

The TRIPS Agreement of 1994 is usually characterized as a technical harmonization exercise that consecrates basic standards of intellectual property protection established in developed countries. From that perspective, there has been a sustained emphasis on compliance by other countries that must conform their laws and practices to these international standards, and on the need for still higher levels of protection that technology exporting countries demand in the name of efficiency and wealth maximization.[105]

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102. *See, e.g.*, JOHN WILLINSKY, THE ACCESS PRINCIPLE: THE CASE FOR OPEN ACCESS TO RESEARCH AND SCHOLARSHIP 55-69 & 111-126 (MIT Press 2006); Ruth Okediji, *Toward an International Fair Use Doctrine*, 39 COLUM. J. TRANSNAT'L L. 75 (2000).

103. *See* Gerhart, *supra* note 29; *see also* Chon, *supra* note 8.

104. *See* Chon, *supra* note 8; Yu, *supra* note 43.

105. *See, e.g.*, Kal Raustiala, *Compliance and Effectiveness in International Regulatory Cooperation*, 32 CASE W. RES. J. INT'L L. 387 (2000); Yu, *supra* note 40; Jerome H. Reichman, *The TRIPS Agreement Comes of Age: Conflict or Cooperation with the Developing Countries?*, 32 CASE W. RES. J. INT'L L. 441 (2000).

In contrast, Maskus and I contend that, perhaps as an unintended consequence, the TRIPS Agreement has spawned an incipient transnational system of innovation, which could provide worldwide incentive effects with positive gains for both innovation and welfare. A number of developing countries, including Brazil, Chile, China, India, Malaysia and Thailand have taken steps to profit from these opportunities, and critics of globalization ignore these growing successes at their peril.[106]

Higher intellectual property standards have nonetheless engendered new problems for all countries, and they have particularly complicated the already arduous task of formulating and implementing economic development strategies in poor countries.[107] In his early work, Maskus emphasized that IP regimes were but one component of a healthy, development-oriented economy and that, without a broader, well-coordinated infrastructure that included corporate law, bankruptcy law, and a solid educational system, among other variables, IP protection might add little to economic growth in its own right.[108] In a perceptive recent article, Margaret Chon argues that the interrelation between IPRs and overall development policies may be far more complex than was previously understood, and that differential and more favorable treatment — which Professor Chon calls "substantive equality" — will become essential if developing countries are to succeed in the post-TRIPS environment.[109]

Other recent studies have focused on the interplay of private and public goods in a healthy, pro-competitive global economy.[110] One key phenomenon here is the extent to which expanding international IP legislation to support the "globalization of private knowledge goods" has increasingly burdened and complicated developing country efforts to achieve broader development goals that

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106. *See, e.g.*, Straus, *supra* note 26; Ryan, *supra* note 22.

107. *See, e.g.*, Dutfield, *supra* note 14 (documenting the role of low intellectual property standards in the history of developed countries' technological evolution); Paul J. Heald, *Mowing the Playing Field: Addressing Information Distortion and Asymmetry in the TRIPS Game*, 88 Minn. L. Rev 249 (2003). *See also* Ketih Aoki, *Neocolonialism, Anticommons Property, and Biopiracy in the (Not-So-Brave) New World Order of International Intellectual Property Protection*, 6 IND. J. GLOBAL LEGAL STUD. 11 (1998).

108. *See* Maskus, *supra* note 93; *see also* Jerome H. Reichman, *Taking the Medicine with Angst: An Economist's View of the TRIPS Agreement*, 4 J. INT'L ECON. L. 795, 802 (2001) (reviewing Keith E. Maskus, INTELLECTUAL PROPERTY RIGHTS IN THE GLOBAL ECONOMY (2000)).

109. *See generally* Chon, *supra* note 8. Whether articles 7 and 8 of the TRIPS Agreement, *supra* note 3, provide some legal foundation for preferential treatment for poor countries remains an open question. *See, e.g.*, Robert Howse, *The Canadian Generic Medicines Panel: A Dangerous Precedent in Dangerous Times*, 3 J. WORLD INTELL. PROP. 493, 502 (2000).

110. *See generally* INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3.

provide both measurable economic growth and equitable access to the fruits of growth for poor and disadvantaged citizens.[111] While history demonstrates that the enforcement of intellectual property rights and the pursuit of overall economic welfare are not antithetical in relatively free-market economies, as some human rights declarations expressly recognize, the one-sided emphasis on private rights in the WTO and WIPO law-making processes has made it far more difficult than in the past for most developing countries to bridge the technology divide[112] and to maintain the supply of such basic public goods as health, education, food security, environmental protection and even a pro-competitive economic environment.

In this regard, they have so far received little comfort from the WTO Dispute Settlement apparatus, which has tended to ignore adverse distributional effects of the TRIPS standards, despite certain enabling provisions in that agreement.[113] While recent legislative concessions regarding public health adopted by the WTO[114] may be seen as a partial response to demands for less "formal equality"[115] and more "substantive equality,"[116] the developing countries have largely been left on their own to sort out the developmental difficulties that TRIPS and post-TRIPS pressures have engendered.[117]

From a broader perspective, the incipient transnational system of innovation that the TRIPS Agreement brought to life in 1994 needs time and a stable competitive environment in which to grow and flourish through the efforts of entrepreneurs in both developed and developing countries, without further top-down regulatory interference from misguided protectionist legislation. WTO Members

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111. *See generally* Maskus & Reichman in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3.

112. *See, e.g., Towards Knowledge Societies*, UNESCO WORLD REPORT, *supra* note 100; PETER DRAHOS & JOHN BRAITHWAITE, INFORMATION FEUDALISM: WHO OWNS THE KNOWLEDGE ECONOMY? (New Press 2002); *see also* Heald, *supra* note 107; Peter K. Yu, *Bridging the Digital Divide: Equality in the Information Age*, 20 CARDOZO ARTS & ENT. L. J. 1 (2002).

113. *See* Howse, *supra* note 109: Gerhart, *supra* note 29; *but see* Jerome H. Reichman, *Securing Compliance with the TRIPS Agreement After US v. India*, 1 J. INT'L ECON. L. 585, 586 & 594-97 (1998)(finding that WTO Appellate Body may defer to local law under art. 1.1 of TRIPS when good-faith effort to comply is otherwise demonstrated).

114. *See supra* note 25; Abbott & Reichman, *supra* note 33.

115. *See, e.g.*, Graeme B. Dinwoodie, & R. Cooper Dreyfuss, *TRIPS and the Dynamics of Intellectual Property Lawmaking*, 36 CASE W. RES. J. INT'L L. 95, 95-96 (2004).

116. *See* Chon, *supra* note 8.

117. Post-TRIPS Pressures under so-called Free Trade Agreements have significantly cut back upon even the public health concessions made under the Doha Ministerial Declaration, *supra* note 25; *see, e.g.*, Abbott & Reichman, *supra* note 33. See also Thomas Cottier, *The Doha Waiver and Its Effects on the Nature of the TRIPS System and on Competition Law—The Impact of Human Rights*, *in* INTELLECTUAL PROPERTY, PUBLIC POLICY, AND INTERNATIONAL TRADE, *supra* note 9 at 173-99.

must be allowed broad latitude to ensure that this system remains pro-competitive, with affordable access to knowledge inputs and outputs for both creators and users of knowledge goods. By the same token, WTO Members must retain sufficient autonomy and power to preserve the supply of global public goods that are indispensable to both growth and welfare in a properly functioning worldwide intellectual property regime.[118]

With specific regard to the promotion of innovation as such, concerned governments must make strenuous efforts to resist claims that the technology exporting industries know what is best for the rest of the world. In reality, legal scholars and economists have never been less certain about the levels of IP protection likely to preserve these industries' long-term competitive advantages even in their home countries.[119] We do not stand at the end of intellectual property history, as the high-protectionist lobby wants us to believe. Nor will ever-stronger IPRs and ever higher levels of harmonization redound to the benefit of even the most developed countries, let alone the rest of the world.

On the contrary, we have crossed a new historical threshold where an emerging transnational system of innovation in an integrated global market place with an interconnected research community breeds unprecedented opportunities and uncharted means of realizing them. Far from locking in the sixteenth and twentieth century intellectual property models of the past, we need new models, and we need time and space to experiment with them, and with new legal approaches to finding the best balance of private and public interests for this global economy. It is precisely a time for experimentation,[120] comparable to the period in the 1880s, when the Paris and Berne Conventions were first negotiated. It is not a time to codify obsolete approaches and standards that are likely to boomerang against the long-term interests of developed countries as well as to undermine economic growth and human welfare in the developing countries.

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118. *See* Maskus & Reichman in INTERNATIONAL PUBLIC GOODS AND IP, *supra* note 3, at 27-33 (suggesting legal modalities to secure this objective by discussing "impact of intellectual property standards on the reserved welfare powers of WTO members").

119. *See, e.g.*, Reichman & Cooper Dreyfuss, *supra* note 39; Dutfield, *supra* note 14 (predicting shift in terms of IP trade favoring China and India).

120. John F. Duffy, *Harmony and Diversity in Global Patent Law*, 17 BERKELEY TECH. L. J. 685, 709-25 (2002).