AVERTING A "TRIPSXIT" FROM THE GLOBAL INTELLECTUAL PROPERTY SYSTEM

Walter G. Park[*]

INTRODUCTION

Is the global IP system working for developing countries? In a recent op-ed article in the *Wall Street Journal*, the heads of the International Monetary Fund, World Bank, and World Trade Organization noted the growing skepticism over globalization and the world trading system.[1] Remonstrations against the system can be found not just in developing countries but in countries like the U.K. (voting for "Brexit"), Austria, and the U.S. The authors point out that slow global growth and unevenly distributed benefits have eroded support for open trade policies.[2]

Yet these are the kinds of policies that are essential to boosting global economic growth and development. Hence, a key challenge appears to be convincing the skeptics that the policies they are anxious about could actually work to their benefit. As the authors state, countries must, first, pursue sound policies and reforms.[3] This is a given. Second, countries must build public support for these kinds of policies and reforms.[4] Governments and institutions need to better communicate how globalization works and how it can help raise living standards.[5]

These two bits of advice—sound policies and better communication—equally apply to world intellectual property reforms, which have been an integral part of the current world trading order. Do intellectual property rights ("IPRs") contribute to world productivity growth? Have the benefits been shared among nations, especially with poor or emerging nations? Are the economic contributions of IPRs visible to the general public? In light of recent pushbacks against globalization, these questions are timely.

While there are no movements at present calling for a mass exodus from the Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS"), some circles harbor strong discontentment with the system, particularly with the impact of IPRs on developing country interests and welfare. For example, in a recent textbook, Rami M. Olwan writes:

---

[*] Professor, Department of Economics, American University, Washington, D.C.

[1] Christine Lagarde, et al., *How to Make Trade Work for Everyone*, WALL ST. J., Oct. 5, 2016, at A15.

[2] *Id.*

[3] *Id.*

[4] *Id.*

[5] *Id.*

> IP proponents who have attempted to uncritically push IP systems onto developing countries, without taking into account all the relevant considerations, have created an unworkable situation that does not benefit those countries. . . . The long-term failure of the international community to produce an approach to IP laws that promotes development in developing countries has eroded the trust and confidence that such countries have in the international IP system.[6]

If this view about the global IP system is widely shared among member states, it is not likely that the system will be sustainable, and indeed this could lead to retreats from the system in the long run.[7] Such a move, however, would run counter to the interests of economic development in that a key determinant of productivity growth and poverty alleviation is technological progress. And technological progress in turn is dependent on the technology policy regime, of which IPRs are a critical component. In an interdependent world economy, the technology policy regime is fashioned by both national and foreign IPRs. Lack of rules and institutions governing knowledge goods would result in losses of market and technological opportunities for both creators and users.[8]

The purpose of this article is to address the skepticism with the global IP system for developing economies. Part I discusses recent empirical studies which show that the impacts of IPRs on economic development are typically conditioned on the presence of certain complementary factors—for example, on the nature of local markets or the technological environment. Part II presents some recent trends that show mixed experiences. Part III focuses on explanations for the differences in experience that different groups of countries have had with IPR reforms. The main objective is to identify the kinds of policies that will make the global IP system work better for those developing economies that have not yet notably benefited from the system.

I. RESEARCH ON ECONOMIC IMPACTS

At the outset, TRIPS stirred intense debate—much of it speculative—about whether the legal and institutional reforms are conducive to economic development.[9] Ha-Joon Chang states that there "are no sound theoretical and

---

6 RAMI M. OLWAN, INTELLECTUAL PROPERTY AND DEVELOPMENT: THEORY AND PRACTICE 2 (2013).

7 *See* Mark F. Schultz & David B. Walker, *How Intellectual Property Became Controversial: NGOs and the New International IP Agenda*, 6 ENGAGE, 82, 82 (2005) (describing a global counter-agenda against IPRs).

8 *See id.* at 85.

9 *See, e.g.*, Graham Dutfield, *TRIPS and Its Impact on Developing Countries*, SCIDEV.NET (Jan. 10, 2001), http://www.scidev.net/global/policy-brief/trips-and-its-impact-on-developing-countries.html ("Of all the agreements administered by the World Trade Organization (WTO), [TRIPS] is undoubtedly the most controversial with respect to its development-related impacts.").

empirical backings for the argument that a strong protection of private intellectual property rights is necessary for technological progress and therefore economic development," a statement that dismisses decades of prior research.[10]

Using his take on historical cases from nineteenth-century Europe, Chang further argues that IPRs are not essential to economic development.[11] Other scholars have pronounced the system of global IP to be against the interest of poorer countries and an impediment to their economic development.[12] These scholars worry that the system significantly raises the prices of important commodities, such as medicines, seeds, and educational materials, and reduces access to technological goods.[13] An IP system, some fear, limits the ability of developing economies to imitate or adapt technologies from abroad. The system is also biased towards innovations developed in the industrialized world and overlooks (and misappropriates) the traditional knowledge of the developing world.[14]

Proponents of reform make the case that the advantages are mutual. Stronger IPRs increase technology transfers to the developing world, stimulate local innovation, and spur innovation in the developed world.[15] TRIPS incorporated flexibilities such as compulsory licensing, enabled countries to establish their own regulations on parallel importation, scheduled transition periods for the developing and least developed countries, and included a provision (Article 66.2) that obliges developed country members to "provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country

---

10 Ha-Joon Chang, *Intellectual Property Rights and Economic Development: Historical Lessons and Emerging Issues*, 2 J. HUMAN DEV. 287, 299 (2001).

11 *Id.* at 288–302.

12 *See, e.g.*, VANDANA SHIVA, PROTECT OR PLUNDER: UNDERSTANDING INTELLECTUAL PROPERTY RIGHTS 4 (2001). Shiva argues that patents create monopolies, restrict knowledge, and privatize knowledge (that is, take what is in the public domain and put it in the private domain). *Id.* at 4–5. However, patents rarely create a monopoly in the sense of a single firm in an industry, and they do not confine knowledge but require it to be disclosed. The IP rights pertain to the commercial exploitation of the invention, not to the underlying technological knowledge. Furthermore, the novelty requirement of a patent should preclude the patenting of technologies that are already known or a part of the state of the art. Shiva also claims that corporations profit off poor people. *Id.* at 6–7. On the contrary, corporations profit off richer people, which is why they target markets with large expected demands for their output, whether pharmaceuticals, films, or consumer products.

13 *Id.* at 7.

14 *See* Graham Dutfield, *Legal and Economic Aspects of Traditional Knowledge*, *in* INTERNATIONAL PUBLIC GOODS AND TRANSFER OF TECHNOLOGY UNDER A GLOBALIZED INTELLECTUAL PROPERTY REGIME, 495, 505 (Keith E. Maskus & Jerome H. Reichman eds., 2005).

15 *See* ROBERT M. SHERWOOD, INTELLECTUAL PROPERTY AND ECONOMIC DEVELOPMENT 88–89 (1990).

Members in order to enable them to create a sound and viable technological base."[16]

More than twenty years have passed since the TRIPS agreement went into effect.[17] By now, a substantial body of evidence exists on the economic impacts of IPRs, though research remains active and further work is needed. Empirical studies thus far indicate how, and under what conditions, IPRs can facilitate the process of economic development. To conserve space, only a few of the studies will be discussed. In addition to these studies, readers are referred to surveys of the literature for overviews of the research.[18]

Since the TRIPS agreement was conceived in the context of global trade negotiations, it makes sense to ask whether TRIPS expands trade. One study finds that the implementation of TRIPS by developing countries expanded their trade in IP-intensive goods relative to a control group of non-IP-intensive goods, and that the effect was most significant in the information and communications technology ("ICT") sector.[19] Another study is able to deal with potential reverse causality problems (i.e., that it is greater trade that leads to stronger IPRs, which would confound the empirical tests), by controlling for the colonial origin of a developing country.[20] The analysis shows that by making their patent regimes TRIPS-compliant, non-colonial developing countries were able to increase the value of their high-tech (patent-sensitive) imports from the developed world by 8.6 percent.[21]

Another way in which goods, services, and technologies flow internationally is through multinational corporations. Studies show that stronger IPRs can affect incentives for foreign direct investment ("FDI"), but here, too, industries vary in their dependence on IPRs to protect their investments. For example, in high-tech sectors, such as pharmaceuticals, chemicals, ICT,

---

16 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, art. 66, ¶ 2, https://www.wto.org/english/docs_e/legal_e/27-trips.pdf [hereinafter TRIPS Agreement].

17 World Trade Organization, *Overview: the TRIPS Agreement*, https://www.wto.org/english/tratop_e/trips_e/intel2_e.htm#top (last visited Apr. 1, 2017).

18 *See generally* Walter G. Park, *Intellectual Property Rights and International Innovation*, *in* 2 FRONTIERS OF ECONOMICS AND GLOBALIZATION: INTELLECTUAL PROPERTY, GROWTH, AND TRADE 289-327 (Keith E. Maskus ed., 2008); K. Saggi, *Trade, Intellectual Property Rights, and the World Trade Organization*, *in* 1B HANDBOOK OF COMMERCIAL POLICY 433, 433–512 (Kyle Bagwell & Robert W. Staiger eds., 2016); Keith E. Maskus, *Intellectual Property in a Globalizing World: Issues for Economic Research*, 22 ASIA-PAC. J. ACCT. & ECON. 231 (2015); Amanda Watson, *Does TRIPS Increase Technology Transfer to the Developing World? The Empirical Evidence*, 20 INFO. & COMM. TECH. L. 253 (2011).

19 Mercedes Delgado et al., *Intellectual Property Protection and the Geography of Trade*, 61 J. INDUS. ECON. 733, 735 (2013).

20 *See* Olena Ivus, *Do Stronger Patent Rights Raise High-Tech Exports to the Developing World?*, 81 J. INT'L. ECON. 38, 46 (2010). The logic behind the colonial status variable is that the increase in IPRs among former colonies in the post-TRIPS period was likely a consequence of historical legacy, whereas the rise in IPR levels in non-colonies is more likely the result of the TRIPS agreement mandating adjustments in countries with lax standards.

21 *Id.*

and professional and scientific equipment, FDI decisions are more sensitive to the availability of IP protection, whereas in other industries—such as transportation—firms can rely on high setup costs to act as a natural barrier against imitation.[22] Moreover, the importance of IPRs varies depending upon the kind of FDI. For example, IPRs matter more for multinationals that want to establish manufacturing and R&D facilities than for those that want to invest in sales and distribution outlets.[23]

Product life cycle is an important variable firms consider in making multinational location decisions. Firms that produce goods with a short life, such as electronic goods, are not very dependent on IP protection since their products may become obsolete well before they are imitated.[24] In contrast, firms producing goods with a long product life have greater exposure to imitation risks and are therefore more responsive to IPRs.[25]

International licensing is another mode of technology transfer. Previous research using firm-level data finds that foreign IP protection is an important determinant of U.S. outward licensing to both affiliated and unaffiliated parties, particularly for those firms that patent heavily.[26] IPRs are also important to the composition of licensing between affiliated and unaffiliated transactions.[27] Generally, multinational firms prefer to transfer technologies internally within the firm, to subsidiaries or affiliates, when foreign IPRs are not sufficiently secure. Once IPRs are sufficiently strong, firms are more apt to engage in arms-length, or unaffiliated, licensing.[28]

The impact of IPRs on licensing varies by type of industry.[29] Industries producing complex goods, like electronics, computers, and communications, are less dependent on IPRs than are industries producing discrete products, like pharmaceuticals, since complex goods (consisting of multiple, interconnected technologies) are harder to imitate whereas discrete products are relatively easier.[30]

---

22 *See* Edwin Mansfield, Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer 4, 13 (Int'l Fin. Corp. Discussion Paper No. 27, 1995).

23 *See* Beata Smarzynska Javorcik, *The Composition of Foreign Direct Investment and Protection of Intellectual Property Rights: Evidence from Transition Economies*, 48 EUR. ECON. REV. 39, 40 (2004).

24 *See generally* L. Kamran Bilir, *Patent Laws, Product Life-Cycle Lengths, and Multinational Activity*, 104 AM. ECON. REV. 1979 (2014).

25 *Id.* at 1981.

26 For an analysis of affiliated licensing, see generally Lee G. Branstetter et al., *Do Stronger Intellectual Property Rights Increase International Technology Transfer? Empirical Evidence from U.S. Firm-Level Panel Data*, 121 Q.J. ECON. 321 (2006). For an analysis of arms-length or unaffiliated licensing, see generally Walter G. Park & Douglas Lippoldt, *International Licensing and the Strengthening of Intellectual Property Rights in Developing Countries During the 1990s*, 40 OECD ECON. STUD. 7 (2005).

27 These are the findings in Olena Ivus et al., *Intellectual Property Protection and the Industrial Composition of Multinational Activity*, at 2 (Vand. U. Dep't Econ., Working Paper No. 15-00012, 2015).

28 *See generally* Park & Lippoldt, supra note 26.

29 *Id.* at 14

30 *Id.*; *see also* Ivus et al., *supra* note 27, at 2, 22–23.

Other research work focuses on the impact of IPRs on innovation. In a multi-country study spanning 1990 to 2006, strong patent rights were found to stimulate pharmaceutical R&D, but primarily for diseases prevalent in high-income countries, and not for neglected diseases (such as malaria or river blindness) prevalent in developing countries.[31] The expected returns to R&D for neglected diseases are low because the afflicted population is poor and represents a limited market from which to derive revenues.

In India, TRIPS has likely had both a stick and a carrot effect on local pharmaceutical R&D.[32] The stick effect is that by prohibiting simple imitation, TRIPS influenced local firms to pursue adaptive innovations, improve and refine existing technologies, and engage in contract manufacturing. The carrot effect is that Indian firms got access to a large export market in generic medicines—the demand for which came from consumers in the industrialized world who are also eager to obtain cheaper drugs as well as maintain access to blockbuster drugs that go off patent.[33] IP rights matter here, too, as generic producers desire protection for their investments in R&D, skills, training, and infrastructure.[34]

The studies mentioned above are a mere sample of the research on the economic impacts of IPRs. A common element in the empirical studies is that the efficacy of IPRs is conditioned on the presence of other factors. This could explain some of the discrepancies between the results of empirical studies and the actual experiences of countries, in that the results "hold" as long as other factors are held constant or coexist. Part II reflects this, showing the diversity of outcomes among countries post-TRIPS.

II. RECENT TRENDS

This Part considers the progress of the developing world in enhancing its technological potential, and offers some commentary. The progress is somewhat mixed. This is not to suggest that the impacts of IP are inconclusive. There are definite impacts in some cases, but they vary by country group.

---

31 *See generally* Margaret K. Kyle & Anita M. McGahan, *Investments in Pharmaceuticals Before and After TRIPS*, 94 REV. ECON. & STAT. 1157 (2012).

32 *See* Ashish Arora et al., *Strong Medicine: Patent Reform and the Emergence of a Research-Driven Pharmaceutical Industry in India* 4, 20–21 (NBER Conference on Location of Biopharmaceutical Activity, Mar. 2008).

33 *See id.* at 6; *see also* Duncan Matthews, *When Framing Meets Law: Using Human Rights as a Practical Instrument to Facilitate Access to Medicines in Developing Countries*, 3 WIPO J. 113, 126 (2011).

34 *See generally* Iain M. Cockburn, *Intellectual Property Rights and Pharmaceuticals: Challenges and Opportunities for Economic Research*, *in* THE ECONOMICS OF INTELLECTUAL PROPERTY: SUGGESTIONS FOR FURTHER RESEARCH IN DEVELOPING COUNTRIES AND COUNTRIES WITH ECONOMIES IN TRANSITION 150, 154, 160–61 (2009), www.wipo.int/edocs/pubdocs/en/wipo_pub_1012-chapter5.pdf.

U.S. Patent Grants and Rank: Top 10 Foreign Countries					
Countries	Grants 2015	Rank 2015	Rank 2005	Rank 1985	Rank 1970
Japan	52,409	1	1	1	3
Korea, Rep.	17,924	2	4	23	42
Germany	16,549	3	2	2	1
Taiwan	11,690	4	3	16	72
China	8,116	5	17	56	39
Canada	6,802	6	6	5	6
France	6,565	7	7	4	4
United Kingdom	6,417	8	5	3	2
Israel	3,628	9	12	15	20
India	3,355	10	18	36	28
Share of U.S. Patent Grants:		2015	2005	1985	1970
Upper Middle Income, excl. China		1.21%	0.83%	0.72%	1.18%
Lower Middle Income, excl. India		0.14%	0.11%	0.05%	0.18%
Low-Income Countries		0.002%	0.001%	0.003%	0.012%

Table 1[35]

Table 1 draws attention to the inventive performance of countries. Specifically, it lists the top ten foreign countries from which patent grants by the U.S. Patent and Trademark Office ("USPTO") originated.[36] What is striking in year 2015 is the number of formerly poor countries that are currently among the top ten innovative nations. For example, the list in Table 1 includes Korea, China, Taiwan, and India. In 1961, South Korea's GDP per person was $91.50 U.S. (or $1,123.10 in 2010 dollars), less than that of sub-Saharan Africa at the time.[37] Not too long ago (during the late 1980s), countries like Korea and Taiwan were on the U.S. Trade Representative's Priority

35 United States Pat. and Trademark Office, *Calendar Year Patent Statistics*, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/reports.htm (last visited Sept. 14, 2017).

36 An advantage of focusing on patents granted in one location, like the United States, is that a common granting standard is used to evaluate patent applications; patents granted in different national patent offices reflect not only differences in invention characteristics but differences in patentability requirements, and the grants may be for duplicate inventions if they comprise a patent 'family.' Moreover, due to the cost of patenting, firms select their relatively most valuable inventions to apply abroad, especially in a large market such as the United States.

37 *World Development Indicators*, WORLD BANK, http://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=KR&view=chart (last visited Sept. 14, 2017) (adjust the control bar beneath the chart to 1961) (providing historical trend line of South Korea's GDP).

Watch List and the subject of many IP complaints.[38] Now Korea and Taiwan are the second and fourth leading foreign countries, respectively, from which USPTO patent grants originated. While China and India still have major enforcement problems, they, too, have reformed their IP systems considerably during the past decade or so,[39] and are among the top ten foreign countries receiving USPTO grants, beating out Australia, Italy, Switzerland, and Sweden.[40] Going back in time provides perspective for how much these four countries leapfrogged their way up. Ten years back, in 2005, China and India ranked seventeenth and eighteenth, respectively, on the list. Thirty years back, in 1985, Korea ranked twenty-third. In 1970, Taiwan ranked seventy-second on the list.

However, as Table 1 shows, the rest of the developing world accounts for less than 2 percent of all U.S. patents granted to foreign countries. Excluding China, upper-middle-income countries—which include Argentina, Malaysia, Mexico, Romania, and Turkey—received 1.21 percent of patents granted to foreigners by the USPTO in 2015.[41] Excluding India, the lower-middle-income countries—which include Indonesia, Kenya, Nicaragua, Pakistan, and the Philippines—received 0.14 percent.[42] Their shares have remained consistent since 1970. If anything, the share of lower-middle-income countries is slightly lower in 2015 than it was in 1970. The share of USPTO patent grants by the low income, or least developed, economies is extremely low, and even then, their share in 2015 is one-sixth that of their share in 1970.

---

38 Office of the United States Trade Representative, Fact Sheet "Special 301" on Intellectual Property (May 25, 1989), https://ustr.gov/sites/default/files/1989%20Special%20301%20Report.pdf.

39 *China's IP Journey*, WIPO MAGAZINE (Dec. 2010), http://www.wipo.int/wipo_magazine/en/2010/06/article_0010.html; Louis Ritzinger, *India's IP Regime: Renewed Reform Efforts and Ongoing Challenges: An Interview with Ashish Bharadwaj*, NAT'L BUREAU OF ASIAN RES. (May 20, 2015), http://www.nbr.org/downloads/pdfs/Outreach/NBR_IndiaCaucus_May2015.pdf.

40 *Patent Counts by Origin and Type Calendar Year 2015*, U.S. Pat. and Trademark Off. https://www.uspto.gov/web/offices/ac/ido/oeip/taf/st_co_15.htm (last visited Sept. 14, 2017).

41 *Calendar Year Patent Statistics*, *supra* note 35.

42 *Id.*

R&D Performed by Business Enterprises Top 10 Countries		
World Share 2011 - 2013		
1	United States	31.2%
2	China	22.4%
3	Japan	12.1%
4	Germany	6.4%
5	Korea, Rep.	5.4%
6	France	3.4%
7	United Kingdom	2.7%
8	India	1.8%
9	Russia	1.7%
10	Canada	1.4%

Table 2[43]

An analysis of research and development (R&D) performed by business enterprises leads to similar inferences. According to Table 2, India, China, Russia, and Korea are among the top ten contributors of world business enterprise R&D during 2011-2013. But Figure 1 also shows that the rest of the developing world contributes very little to world business enterprise R&D. Excluding China, upper-middle-income countries account for less than 4 percent of world business enterprise R&D during 1996-2013. Their share at the end of this period was about the same as it was at the beginning of this period—roughly 2.5 percent. Excluding India, the share of world business enterprise R&D performed in lower-middle-income countries is less than a half percent throughout the period.

43 UNESCO INSTITUTE FOR STATISTICS, GLOBAL INVESTMENTS IN R&D 3 (2015), http://uis.unesco.org/sites/default/files/documents/fs36-global-investments-in-rd-2015-en.pdf.

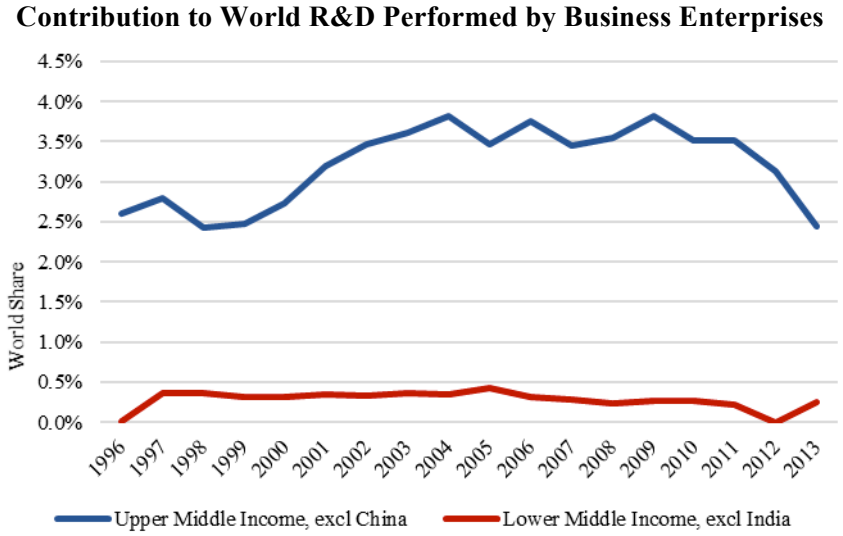

Figure 1[44]

Table 3 turns to a very important indicator: the technological balance of payments ("BOP"). The BOP is measured as the difference between royalties and licensing receipts and royalties and licensing payments of a country.[45] It tracks how much income a country earns from enabling other countries to use the innovations and creations developed by its nationals, as well as the payments that a country has to make in order to use the innovations and creations developed by foreigners. If the technological BOP is positive, a country is considered a net exporter of intellectual property services. If it is negative, the country is considered a net importer of intellectual property services.[46] Table 3 shows figures in millions of constant 2010 dollars so as to control for inflation. All types of intangible assets are considered: patents, copyrights, designs, and trademarks.

---

44 *Id.*

45 *OECD Science, Technology and Industry Scoreboard 2009*, OECD iLIBRARY, http://www.oecd-ilibrary.org/sites/sti_scoreboard-2009-en/04/05/index.html?itemId=/content/chapter/sti_scoreboard-2009-49-en (last visited Sept. 14, 2017).

46 *Id.*

Technological Balance of Payments						
Country/Group	**2003**			**2012**		
	Receipts	Payments	Balance	Receipts	Payments	Balance
Korea, Rep.	1,532	4,171	-2,639	3,307	8,072	-4,766
China	125	4,145	-4,020	1,005	17,083	-16,078
India	28	642	-614	305	3,848	-3,544
South Africa	31	720	-689	65	1,941	-1,876
Brazil	126	1,434	-1,308	492	3,529	-3,037
Russia	203	830	-627	639	7,343	-6,704
	Receipts	Payments	Balance	Receipts	Payments	Balance
United States	66,370	22,499	43,871	119,638	40,416	79,222
Japan	14,339	12,836	1,503	30,651	19,172	11,479
Germany	5,238	6,223	-985	12,892	11,727	1,165
France	4,736	2,833	1,903	12,248	8,365	3,884
United Kingdom	11,776	9,175	2,602	10,949	7,852	3,097
	Receipts	Payments	Balance	Receipts	Payments	Balance
Other High Income	28,366	65,710	-37,344	64,527	120,522	-55,995
Other Upper Middle	511	4,605	-4,095	972	10,008	-9,036
Other Lower Middle	242	1,231	-989	228	3,583	-3,355
Low Income Countries	30	26	4	23	21	2

Table 3[47]

The first group of countries in Table 3 represents net technology importers and the second group net exporters (except for Germany in 2003). The net technology importers tend to be the developing economies, while the net exporters are the industrialized countries. It is expected that the net exporters of technology would gain the most from stronger IPRs worldwide since they own most of the world's intellectual property assets, such as pharmaceuticals, films, song rights, software, hardware, and brands. Between 2003 and 2012, their technological balance of payments surpluses expanded considerably. During the same period, the technological balance of payments deficits of the net importing countries widened.

There are two ways to interpret these trends. On the one hand, increased payments of licensing fees and royalties by the developing world could signify that these countries got increased access to IP assets (e.g., technologies, industrial secrets, medicines, seeds, creative works, and franchising), which

47 UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT, *International Trade in Related Services: Royalties and License Fees, Annual, 2003-2012*, http://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx.

is a positive development. On the other hand, increased payments could represent increased rent for the high-income G5 countries (due to stronger IPRs). That is, their BOP surpluses are the result of improved terms of trade and consequent ability to charge higher fees per transaction. The reality is likely to be a bit of both—that developing economies got more access to knowledge capital and that they paid more for it.

The rest of Table 3 shows the technological balance of payments for the remaining developing countries. The deficits of the upper-middle- and lower-middle-income countries expanded, too, in real terms. Interestingly, the technological balance of payments is positive for low-income countries. But, of course, this surplus position does not connote economic strength, since the levels of technology they create are very low. Rather, it reflects the low levels of technology they import or get to access from abroad.

The positive, but small, technological balance of payments surplus of low-income countries is nonetheless intriguing. It can help speak to one aspect of the controversy about the impact of IPRs on poor countries, which is that they would be burdened by high prices and fees in order to access IP-related goods and services. If they are paying exorbitant fees for access to what limited technologies they do license from abroad, much higher licensing payments—or at least large technological BOP deficits—should have been observed.

III. EXPLANATORY FACTORS

This Part turns to some of the reasons why certain developing economies acquired increased innovative capacities and access to technologies, while others did not. This Part identifies some areas for further work among practitioners and the policy community.

A. *Complementary Factors*

The empirical studies and actual experiences indicate that IPRs are not the only factor determining technological potential. Other conditions must be present, such as good governance and quality institutions. An Asian Development Bank study found that IPRs work well at attracting technology transfer in countries with formal institutions but not so well in those with informal systems.[48]

---

[48] Minsoo Lee & Donghyun Park, *Intellectual Property Rights, Quality of Institutions, and Foreign Direct Investment into Developing Asia* 12–13 (Asian Dev. Bank Econ. Working Paper Series No. 354, 2013), https://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID2295772_code1478488.pdf?abstractid=2295772&mirid=1.

Promoting an overall competitive and outward-oriented market is also essential. The developing nations that seem to have done well with their IPR reforms were those that were export-oriented or became more so, such as South Korea, Taiwan, Singapore, Hong Kong, and India. Open competitive markets help mitigate the market power effects of IPRs. In that regard, the IP system should protect not just the existing rights of incumbent innovators but also enable the acquisition of rights by new entrants or potential entrants.[49] Follow-on innovators, creators, new start-up companies, and spin-off companies should be able to build upon existing works or introduce groundbreaking new works and compete effectively with existing firms. Intense competition can also be a driver of industrial innovation, as firms vie to race ahead.[50] Removal of barriers to technologies falling into the public domain upon the expiration of IPRs should promote and maintain the competitiveness of markets.[51]

B. *Threshold Factors*

IPRs may have a significant impact on innovation after economies reach some threshold level of technological capabilities or absorptive capacities (that is, the capacities to identify, assimilate, and exploit valuable knowledge).[52] Laws and regulations do not change these capacities overnight. The legal and institutional regime helps create an environment conducive to business investment and human capital accumulation, but not the underlying capabilities. This may be why certain developing countries that possess an ability to absorb knowledge—like Brazil, China, India, Russia, and Taiwan—are better able to utilize the IP system.

It is not only the quality of an innovation that affects productivity. A user's understanding and capability of using the technology effectively (and

---

49 For example, changes in patent breadth can shift the relative bargaining strength between incumbents and entrants. A broader scope favors incumbent firms. New entrants need to wait their turn until after existing IP rights expire in order to enjoy the benefits of broader scope. Hence, the broader the scope of patent rights, the more back-loaded the payoffs to innovation are. Depending upon time-discounting and how long entrants would have to wait, the innovation incentives of entrants could be lowered. *See* Ted O'Donoghue & Josef Zweimüller, *Patents in a Model of Endogenous Growth*, 9 J. ECON. GROWTH 81, 107–08 (2004).

50 *See* Philippe Aghion et al., *Competition, Imitation, and Growth with Step-by-Step Innovation*, 68 REV. ECON. STUD. 467, 470 (2001).

51 This applies to the entry of generic drug firms as well as to the expiry of copyrighted materials.

52 *See* Walter G. Park & Juan Carlos Ginarte, *Intellectual Property Rights and Economic Growth*, 15 CONTEMP. ECON. POL'Y 51, 51–52 (1997); *see also* Theo Eicher & Cecilia García-Peñalosa, *Endogenous Strength of Intellectual Property Rights: Implications for Economic Development and Growth* 52 EUR. ECON. REV. 237, 253 (2008) (finding that stronger institutions for intellectual property rights are required for high-growth than for no-growth economies).

safely) matters, too. The case of BtCotton in India is an example of the importance and need for training, education, and assistance on the use of technology. BtCotton is a genetically modified seed variety licensed by Monsanto.[53] It is insect-resistant, particularly to the Bollworm, and has much value to farmers working in tropical climates, such as Southern India.[54] BtCotton has enabled India to become a leading producer and global exporter of cotton.[55] However, if the product is not used properly, soil damage may occur as Bt toxin enters the soil and drains macro nutrients from it, potentially destroying the ability of the land to grow more cotton.[56] This has apparently happened to many Indian farmers who adopted these seeds but without adequate training in the care and handling of the technology.[57]

C. *Big Push Versus Gradualism*

Another consideration is whether it is better to have swift, radical intellectual property reforms or gradual, incremental ones. Some scholars point to the success countries have had with lighter forms of IPRs, such as utility models (or petty patents) that grant intellectual property protection for innovations with a small inventive step.[58] They cost less to apply for, provide a shorter duration of protection than a patent, and require no substantive examination. Historically, countries like Germany, Austria, and Japan relied heavily on utility models.[59]

Some scholars argue that those kinds of IPRs are more appropriate for emerging economies because such forms of protection "incentivize" incremental and adaptive innovative activity, which can then serve as a stepping stone for more revolutionary innovative activity.[60] In that sense, countries could transition to stronger IP regimes gradually—that is, in baby steps from, say, no patent system to a petty patent system to a full-scale modern patent system.

---

53 Lisa L. Mueller, *India's Stringent and Shifting Policy on Genetically Modified Cotton Seeds*, BRIC WALL (June 13, 2016), https://bricwallblog.com/2016/06/13/indias-stringent-and-shifting-policy-on-genetically-modified-cotton-seeds/.

54 *Id.*

55 Prakash Sadashivappa & Matin Qaim, *Bt Cotton in India: Development of Benefits and the Role of Government Seed Price Interventions*, 12 AGBIOFORUM 172, 173 (2009).

56 *Monsanto's Bt Cotton Kills the Soil as Well as Farmers*, SCI. SOC'Y ARCHIVE (Feb. 23, 2009), http://www.i-sis.org.uk/BtCottonKillsSoilandFarmers.php.

57 *See* Mae-Wan Ho, *Farmer Suicides and Bt Cotton Nightmare Unfolding in India*, SCI. SOC'Y ARCHIVE (Jan. 6, 2010), http://www.i-sis.org.uk/farmersSuicidesBtCottonIndia.php.

58 *See* Yee Kyoung Kim et al., *Appropriate Intellectual Property Protection and Economic Growth in Countries at Different Levels of Development*, 41 RES. POL'Y, 358, 358 (2012); Dan Prud'homme, *Utility Model Patent Regime "Strength" and Technological Development: Experiences of China and other East Asian Latecomers*, 42 CHINA ECON. REV. 50, 51–52 (2017).

59 *See* Kim et al., *supra* note 58, at 365–66.

60 *Id.* at 368.

Among the list of successful formerly developing economies in Table 1, China, South Korea, and Taiwan have relied heavily on utility models as part of their industrialization strategy.[61] It is quite interesting to note that their dependence on utility models diminished after they achieved a greater level of economic development and innovative capacity. For example, the ratio of utility model applications to patent applications rose from the 1960s to the mid-1990s, and thereafter it declined. During the same period, IPR laws and regulations had strengthened.[62] Either these intellectual property reforms stimulated more patentable innovations, or, as may be the case here, these countries developed their innovative capacities to a point where their institutional needs shifted. Stakeholders demanded a stronger IPR system, as the nature of R&D shifted from incremental to more cutting-edge. In this case, a structural transformation in indigenous innovative capacity had driven IP reforms. In turn, the stronger IP system provided the environment for firms to continue doing more creative R&D.

Many of the small inventors who sought utility model protection specialized in short-cycle technologies, such as electronics. This proved to be a strategy amenable to technological catch-up.[63] Latecomers, like the newly emerging economies in Asia, were at less of a competitive disadvantage against incumbents in a short-cycle industry since they did not have to depend on the prevailing technologies dominated by incumbents. Those technologies had a short life, and their eventual obsolescence would enable new players to emerge.

In short-cycle industries, new entrants can displace incumbents more frequently. In longer-cycle industries, the latecomers have more catching up to do, such as acquiring the necessary skills, investing in facilities, and competing with technologies that not only had a head start but may have captured brand loyalty among consumers.

---

61 *Id.* at 360. India did not rely on a utility model system. Recently, in 2011, the Indian government solicited feedback from industry, academia, government agencies, and other interested parties, about the need for utility model protection. *See Discussion Paper: Subject Utility Models*, DEP'T OF INDUS. POL'Y & PROMOTION, MINISTRY OF COM. & INDUS. 2 (May 13, 2011) http://dipp.nic.in/english/Discuss_paper/Utility_Models_13May2011.pdf. Reactions were mixed. Several small and medium enterprises were in favor, but others expressed the view that the time had passed for specializing in it, as India's high-tech sector has been growing more complex.

See Comments Received From Public on Utility Models, DEP'T OF INDUS. POL'Y & PROMOTION, MINISTRY OF COM. & INDUS., http://dipp.nic.in/English/Discuss_paper/FeedBack_UtilityModels.htm (last visited Mar. 21, 2017).

62 *See* Kim et al., *supra* note 58, at 360.

63 *See* KEUN LEE, SCHUMPETERIAN ANALYSIS OF ECONOMIC CATCH-UP 6–7 (2013).

D. *Stage of Development*

Another reason why innovation responded positively to stronger IPRs in some developing countries but not in others may have to do with the appropriateness of IP standards at different stages of economic development. A significant strand of the academic literature advocates differentiation of IP standards by level of economic development.[64] It argues that the optimal strength of IPRs—whether the duration or scope of protection—should be lower for poorer countries than for industrialized economies. Of course, the TRIPS agreement establishes minimum standards only and allows countries to provide more extensive protection than the agreement requires.[65] In that sense, TRIPS does not harmonize IP standards around the world (other than set a common minimum). Once countries have met the minimum, their optimal IPRs can vary depending upon their stage of economic development. However, the question is whether the TRIPS minimum standards are too strong—or inefficient—for developing economies, particularly low-income countries.[66]

The appropriate level of IPRs likely varies by country group because the optimal level of protection balances the marginal cost and the marginal benefit of protection. The marginal cost derives from the augmented market power of sellers (i.e., deadweight losses), and the marginal benefit from the increased innovation incentives. Developing economies, in general, have smaller market sizes and lower innovative capacities. These make the marginal benefits of IPR lower and the marginal burden of IPR greater in the developing world. Consequently, the social-welfare-maximizing level of IPR is lower in the developing world than in the developed world. The majority of innovation returns arise in the developed world, where markets are larger and purchasing power greater. The majority of R&D occurs in the developed world, and the majority of profits from innovation accrue to that part of the world. These factors make it more socially valuable to have stronger IPRs in the developed world.

Examples where the developing world benefited from different IP standards include the utility model case discussed earlier. They can also include the case of India, for which TRIPS exempted product patents for pharmaceuticals until 2005.[67] This gave the pharmaceutical sector in India some time to make internal adjustments. Appropriate IPRs for economic develop-

---

64 *See* Angus C. Chu, et al., *Stage-Dependent Intellectual Property Rights*, 106 J. DEV. ECON., 239, 240 (2014); Gene M. Grossman & Edwin L.-C. Lai, *International Protection of Intellectual Property*, 94 AM. ECON. REV., 1635, 1635–36, 1651–52 (2004).

65 Grossman & Lai, *supra* note 64, at 1635.

66 *Id.*

67 *See* TRIPS Agreement, *supra* note 16, at art. 65, ¶ 4; *see also Pharmaceutical Patents and the TRIPS Agreement*, WTO, (Sept. 21, 2006), https://www.wto.org/english/tratop_e/trips_e/pharma_ato 186_e.htm.

ment can also refer to different types of IPR. For example, developing economies whose comparative advantage is in agriculture may benefit from a system of geographical indications, which are product names associated with particular locations and specific product characteristics (such as Darjeeling Tea, Karoo Lamb, or Kampot Pepper). Geographical indications can be a source of export earnings for developing nations and help support their rural development.

E. *Costs of IP Procurement and Enforcement*

It is one thing to strengthen legal rights, but it is another to make those rights accessible or affordable. The costs of obtaining and defending IPRs, such as patent rights, are well known to be quite significant.[68] The current global IP system is very costly or prohibitive for small players. The costs include not only official fees but also agent or attorney fees, and the costs of translating applications into local official languages, where required.

This might explain why inventors from developing countries account for a tiny share of world patents granted (as well as other kinds of IP, like trademarks). A positive feedback effect could also arise whereby the lack of IP rights further weakens the negotiating positions of developing country players vis-à-vis the developed world. Thus, while developing countries may have strengthened their IP systems in accordance with TRIPS standards, local innovators are not able to benefit from IP protection because of the cost of acquiring IP rights nationally, regionally, or worldwide. And even if they acquired those rights, the high costs of enforcement may have rendered it difficult to assert their rights.

F. *Technology Transfer Shortcomings*

Most often it is the developing nations that come to mind when the subject of noncompliance with TRIPS comes up. Rarely is the compliance of developed countries at issue. Recall, though, that governments of developed countries have an obligation under Article 66.2 of TRIPS to provide incentives for enterprises and institutions within their territories to engage in technology transfers to least developed countries.[69] It was not until after the Doha Round of 2001 that the TRIPS Council adopted a decision to set up a "mechanism" for monitoring and implementing the mandate.[70] The decision called

---

68 Walter G. Park, *On Patenting Costs*, 2 WIPO J. 38 (2010).

69 TRIPS Agreement, *supra* note 16, at art. 66, ¶ 2.

70 Council for Trade-Related Aspects of Intellectual Property Rights, Decision of the Council for TRIPS of 19 February 2003, *Implementation of the Article 66.2 of the TRIPS Agreement*, WTO DOC. IP/C/28 (Feb. 20, 2003).

for developed country governments to submit reports annually to demonstrate how they were fulfilling this obligation. Full reports are to be submitted every three years (beginning with 2003), with updates in the intervening years.[71] Previous scholars have questioned whether these reports provide any useful information about the technology policies of developed country governments.[72] Even so, these reports convey some information about the efforts at, or degree of, compliance with Article 66.2.[73]

Article 66.2 does not mandate that the government itself perform the technology transfers. Rather it simply requires governments to provide incentives for firms and other organizations within its jurisdiction to engage in technology transfer activities in less developed countries. Furthermore, Article 66.2 does not specify what kinds of incentives to provide. Should they be fiscal incentives or involve government programs? Since the manner by which governments should create these incentives is not stipulated, concern arises that even policies that are remotely relevant to technology transfer activities may count as being compliant.[74] Before discussing the kinds of programs that developed countries reported in their submissions to the TRIPS Council, it will be useful to check whether reports were submitted at all.

---

71 *Id.* at ¶ 1.

72 Suerie Moon, *Does TRIPS Article 66.2 Encourage Technology Transfer to LDCs? An Analysis of Country Submissions to the TRIPS Council (1999-2007)*, 2–3 (Int'l Ctr. for Trade & Sustainable Dev., Policy Brief No. 2, Dec. 2008), http://www.ictsd.org/downloads/2008/12/policy_brief_2.pdf.

73 This section borrows from Walter Park, et al., *Europe Beyond Aid: Evaluating Europe's Contribution to the Transfer of Technology and Knowledge to Developing Nations*, 2 (Ctr. for Global Dev. Consultation Draft), https://www.cgdev.org/sites/default/files/europe-beyond-aid-technology_0.pdf.

74 *Id.* at 24.

Developed Country Submission of Reports on Technology Transfer Activities (per Article 66.2 TRIPS)

Countries	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Australia	X			X	X	X	X	X	X	X	X	X	X	X
New Zealand	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Norway	X		X	X	X	X	X	X	X	X	X	X	X	X
Switzerland	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Canada	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Japan	X		X	X	X	X	X	X	X	X	X	X	X	X
United States	X	X	X	X	X	X	X	X	X	X	X	X	X	X
European Union	X	X	X	X	X	X	X	X	X	X	X		X	X
Austria	X				X	X	X	X	X	X			X	X
Belgium					X	X	X	X	X		X		X	
Czech Rep.	X		X	X	X	X	X							
Denmark	X		X		X	X	X	X		X			X	X
Estonia													X	X
Finland	X	X	X		X	X	X	X	X	X	X		X	X
France		X	X	X	X	X	X	X	X	X	X		X	X
Germany	X	X	X	X	X	X*	X	X	X					
Greece														
Ireland		X	X			X				X	X		X	X
Italy			X											
Luxembourg													X	
Netherlands	X		X										X	
Portugal														
Slovakia			X	X					X	X	X		X	
Spain	X	X	X		X	X	X	X		X			X	X
Sweden	X	X	X		X	X	X	X	X	X	X		X	X
United King.	X				X		X	X	X	X	X		X	X
Notes: X indicates that a report was submitted. * indicates no narration; just a table of programs was submitted.														

Table 4[75]

Table 4 provides a list of developed countries and indicates whether they have submitted a report in each year since 2003. As the table indicates, gaps exist in the reporting by countries. In some years, countries missed submitting a report. Some countries, like Greece and Portugal, have never provided a report. Others like Italy submitted only once, and the Netherlands submitted a report three times. In 2008, Germany merely provided two pages of a table, with no narrative.

---

75 *Id.* at 25–26 (citing WORLD TRADE ORGANIZATION, *WTO Documents Online, Intellectual Property*, https://docs.wto.org/dol2fe/Pages/FE_Browse/FE_B_009.aspx?TopLevel=4482 (last visited April 16, 2017)).

Selected Examples of Technology Transfer Activities Reported in the Article 66.2 Submissions, 2011-2015

Authority	Program
Australia	Initiative to improve quality of financial reporting in Tuvalu gov't 2011-2015, $A483,000
Australia	Mining Study Tour for officials from African governments, $A900,000
Austria	Established a 'Trainer of Training Program's via the Austrian Development Agency
Canada	Int'l Development Research Center, mobile and internet access, Myanmar 2015-18, 1.2 million CDN
European Union	Supply of small and medium farm machinery to N. Korea, 2 million euros
European Union	Support for Energy and Environment to Africa Regional, 28.2 million euros
European Union	Private Sector Development in Ethiopia, 11 million euros
European Union	Support to Innovative Enterprises in Ukraine, 2.5 million euros
European Union	Research on aquaculture's impact on human development in Bangladesh, 24,000 euros
European Union	Dengue Fever research in Cambodia: assess risk of transmission to Southern Europe, about 750,000 euros
European Union	Support to a university in Senegal to study the demographics of migrating African women, 15,000 euros
European Union	Horizon 20/20 Climate Action Database, 9.9 million euros
Finland	Business partnership support in Official Development Assistance (ODA)-countries, 4.3 million euros
Finland	Practical training course on copyright law and European Copyright system, Helsinki (2009)
France	Training of officials in charge of Geographical Indications (budget: less than 1 million euros)
Japan	Training program for Good Governance in Pharmaceutical Regulatory Authorities
Japan	Japanese Patent Office (JPO) Courses on Patent Examination practices for ASEAN countries
Japan	Japan International Cooperation Agency (JICA), budget $1.7 billion (FY 2010) for global activities
Japan	Sanitary Napkins via personal hygiene education and dental care services in Myanmar
Spain	Iberoeka Project: Financial and non-financial incentives for FDI, licensing, and franchising abroad
Sweden	Risk capital to companies investing in energy/environment in less developed countries (LDCs)
United Kingdom	Event for Mobile Phone Banking, 30,000 British pounds
United Kingdom	Teaching English in Bangladesh
United Kingdom	Funding for Higher Institutions in Africa and Asia, 3 million euros
United Kingdom	Support for a biometric system (fingerprint scanning) for voter registration in Sierra Leone
United States	Partnerships between U.S. Government agencies (USAID, EPA, CDC) and developing countries
United States	Licensing of Health Care Technologies (Vaccines), Funding of R&D on Infectious Diseases by the NIH
United States	OPIC Provision of Risk Insurance and support for U.S. investment in emerging markets, $800 million
United States	African Growth and Opportunity Act, providing duty free access to goods from sub-saharan Africa
United States	U.S. Department of State and Department of Commerce Workshops and Agreements on Science & Tech
United States	Trade Capacity Building Assistance to less developed countries (LDCs), $771 million
United States	U.S. Department of Agriculture Technology Transfer: distribution of plant germplasms to LDCs
United States	USPTO training and technical assistance to less developed countries (LDCs)

Notes:
Amounts spent on programs are not specified if there was inadequate information.
USAID denotes U.S. Agency for International Development, NIH National Institutes for Health, EPA Environmental Protection Agency, CDC Center for Disease Control, NSF National Science Foundation, OPIC Overseas Private Investment Corporation, and USPTO U.S. Patent and Trademark Office.

Table 5[76]

Table 5 provides a sample of programs and activities reported by the developed countries in their submissions. First, the programs often involve relatively paltry sums. Second, the reports describe programs in general terms, focusing on the mission and intended goals, albeit with some circumlocution. For example, in its 2016 submission the EU describes how a project to build a database on climate action "will implement innovative ways for the communication and dissemination of the results of 'continuous engagement' by local stakeholders."[77] There are repetitious paragraphs from year to year that seem to have been copied and pasted from previously written statements and declarations. The descriptions lack details on how the programs were carried out, who the participants were, and the criteria for measuring success.

---

76 *Id.*

77 Council for Trade-Related Aspects of Intellectual Property Rights, *Report on the Implementation of Article 66.2 of the TRIPS Agreement: European Union*, at 10, WTO Doc. IP/C/W/611/Add.7 (Feb. 18, 2016).

Third, the programs vary in quality and relevance to technology transfer. Some of the Swedish projects are quite substantive, involving the transfer of clean technologies, wind power, electrical distribution systems, and plant breeding techniques to African countries.[78] In contrast, the UK counts a program to teach English in Bangladesh as one of its technology transfer activities, as well as its programs to assist with voter registration in Sierra Leone or to showcase mobile phone banking in Africa.[79] Japan has counted health-related programs, such as personal hygiene education in Myanmar via booklets and other supporting materials as fulfilling its tech transfer obligations.[80] The U.S. reports contain activities to help countries reform their policies and institutions up to higher standards, such as providing seminars to foreign judicial officials and advising them on writing patent and copyright laws.[81]

Fourth, many programs do not specifically target the less developed economies. For example, Spain's *Iberoeka* program promotes technology transfer projects in South American countries like Argentina, Brazil, Chile, and Mexico, by offering financial incentives such as soft loans and nonfinancial support such as advice and contacts for Spanish firms.[82] Independent analysis by Suerie Moon suggests that a minority of reported activities actually qualify as incentives for technology transfer if a narrow definition of qualifying incentives is used.[83] Such a narrow definition includes financing the purchase of technologies, incentives for FDI in technologically oriented fields, providing venture capital, and so forth.[84]

Moon also finds that less than half of the reported activities target the least developed countries.[85] Indeed, the E.U. submission from February 2016 acknowledges that it does not have a specific policy per se for technology transfer:

> [I]t should be borne in mind that no technology transfer program is specifically dedicated to least developed countries as such. [EU] initiatives are usually specific to

---

78 *Id.* at 76, 78–79.

79 Council for Trade-Related Aspects of Intellectual Property Rights, *Report on the Implementation of Article 66.2 of the TRIPS Agreement: European Union*, at 47–48 (teaching English), 55–57 (voter registration), 50–52 (mobile phone banking), WTO Doc. IP/C/W/594/Add.3 (Oct 4. 18, 2013).

80 Council for Trade-Related Aspects of Intellectual Property Rights, *Report on the Implementation of Article 66.2 of the TRIPS Agreement: Japan*, at 9, WTO Doc. IP/C/W/616 (Oct. 21, 2016).

81 Council for Trade-Related Aspects of Intellectual Property Rights, *Report on the Implementation of Article 66.2 of the TRIPS Agreement: United States of America (Addendum)*, at 7–9, WTO Doc. IP/C/W/616/Add.5 (Oct. 27, 2016).

82 *Report on the Implementation of Article 66.2 of the TRIPS Agreement: European Union*, *supra* note 77, at 72–73.

83 Suerie Moon, *Meaningful Technology Transfer to the LDCs: A Proposal for a Monitoring Mechanism for TRIPS Article 66.2*, 4–5 (Int'l Ctr. for Trade & Sustainable Dev., Policy Brief No. 9, Apr. 2011), http://www.ictsd.org/sites/default/files/research/2011/05/technology-transfer-to-the-ldcs.pdf.

84 *Id.*

85 *Id.* at 4.

> countries/groups of countries/regions, since the [EU] strongly supports regional integration, which fosters better understanding and political and economic links between neighbouring countries. However, the [EU's] approach to the allocation of aid and incentives pays particular attention to the situation of the least developed and other low income countries.[86]

It should be clear that there is scope for more improvement in the area of technology transfers to poor countries. As Table 3 showed, the level of access of low-income countries to global technology is extremely low. Greater and better compliance with Article 66.2 should go a long way towards rectifying that situation. More substantive activities and incentives for North-South research collaboration, innovation networks, and joint ventures should be a high priority.[87] Upper-middle-income countries like South Korea, Singapore, and Taiwan should also be included to take part in international technology transfer activities that can benefit the least developed countries.

CONCLUSION

Keeping the global IP system intact and well-functioning requires that member countries have a vested interest in it. Member states need to recognize that they gain from the system, and that IPRs in conjunction with other factors contribute to their innovative capacities. Innovative capacity is paramount to raising productivity and living standards. But it is also a factor that enables countries to better utilize the IP system to their advantage. Innovative capacity gives countries a stake in the system.

This article discussed research on how the IP system can contribute to economic development. It showed the varying experiences of developing countries in achieving innovative capacity and access to global knowledge capital.

The article then turned to factors that could account for the differences in experiences and that may be the basis for improving the utilization of the global IP system for low-income economies. For instance, IP reforms should be complemented by other institutional reforms, including market reforms. Policies and reforms should address not only laws and regulations but also absorptive capacities. They should take into account the circumstances of developing economies, adjusting where needed the types of IP protection and levels of strength appropriate to their technological capacities and comparative advantages. The costs of obtaining IP protection, enforcing IP rights, and

---

86 Council for Trade-Related Aspects of Intellectual Property Rights, *Report on the Implementation of Article 66.2 of the TRIPS Agreement: European Communities (Addendum)*, at 2, WTO Doc. IP/C/W/452/Add.6 (Dec. 12, 2005).

87 For additional discussion on options for international technology transfers, see generally Keith Maskus & Kamal Saggi, *International Technology Transfer: An Analysis from the Perspective of Developing Countries* (Sept. 19, 2014), http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_14/cdip_14_inf_11.pdf.

navigating the global system must also be addressed to ensure a level playing field among new and established players.

The IP system is highly relevant to the development of indigenous innovative capacities. First, empirical studies have shown robustly that IPRs matter for international technology transfer, such as foreign direct investment. Infringement and illicit trade discourage multinational entry into developing country markets if they reduce overall profitability below the cost of entry. With multinational entry, FDI can be a source of income, employment, productivity spillovers, and other opportunities. Local businesses that provide complementary goods and services can form around hubs of affiliates or subsidiaries of multinational companies. Indigenous firms can also learn and establish related businesses via start-ups, spinoffs, licensing, or joint ventures.

Second, by encouraging the growth of knowledge industries, IPRs can indirectly motivate investments in human capital and occupational choice. The literature on international trade has shown that globalization and export orientation can stimulate incentives for education.[88] Globalization and export orientation help raise the returns to education and the acquisition of requisite skills. In related work, export orientation was found to bring about the substitution of schooling for child labor.[89] Where the returns to education are low—say, for lack of industries and employment opportunities that demand educated workers—the opportunity cost for young people to get an education is high in terms of forgone wages (earned in child labor sectors, whether farms or textile factories). Likewise, in economies that do not produce much intellectual property, the returns to occupations in the creative arts, sciences, and engineering are low, as are the returns to investing in the necessary skills. And with limited human capital investments, the indigenous innovative capacities of these economies will remain low. Thus, a kind of "development trap" arises where too little growth in IP-related sectors results in too little accumulation of human capital, and too small a stock of human capital results in limited abilities to produce IP-related products and exploit IPRs effectively.

Lastly, a few words about whether technology trade deficits should worry developing nations. It is to be expected that most developing economies (especially technology followers) will experience wider deficits in their technological balance of payments as they raise their IPRs. The deficits should be a sign that they are attracting more global knowledge products (than they are presently capable of exporting to the rest of the world). As was shown in Table 3, even the developing economies that achieved greater in-

---

88 Emily Blanchard &William W. Olney, *Globalization and Human Capital Investment: Export Composition Drives Educational Attainment* 2 & n.3 (Williams Coll. Econ. Dept., Working Paper No. 2013-18, 2016).

89 Eric V. Edmonds et al., *Child Labor and Schooling in a Globalizing World: Some Evidence from Urban India*, 7 J. EUR. ECON. ASS'N 498, 506–07 (2009).

novative capacities are still running technological balance of payments deficits. Here, technology indebtedness is not necessarily a "bad" and is more likely a "good." The increased imports of knowledge capital can be used as a platform for augmenting domestic productivity and future export potential.

It should also be expected that some sectors, say, pharmaceuticals, will run a deficit, while another sector, say, software, will run a surplus—or that the entire technology sector could be in deficit vis-à-vis the world while another sector, like manufacturing, could be in surplus. Long-term persistence in technology trade deficits may be problematic if dynamic investments in innovative and creative capacities have not been dedicated and if the payments largely represent rent transfers abroad. Nonetheless, the mere observation of technological balance of payments deficits should not be a cause for opting out of international IP obligations.