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Three Megatrends in the International Intellectual Property Regime

Peter K. Yu

THREE MEGATRENDS IN THE INTERNATIONAL INTELLECTUAL PROPERTY REGIME♦♠

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INTRODUCTION

Since the establishment of the Paris Convention for the Protection of Industrial Property[1] in 1883 and the Berne Convention for the Protection of Literary and Artistic Works in 1886,[2] the international intellectual property regime has encountered two world wars, struggled with several global pandemics, welcomed dozens of newly independent nations, and interacted with a wide variety of technologies and innovative practices. Although this regime progressed only slowly for the larger part of its first century, it saw major transformation in the past four decades.

Due to its limited length, this Article is unable to provide a comprehensive analysis of the different aspects of this transformation. Instead, it identifies three megatrends[3] to illuminate the magnitude and

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1 Paris Convention for the Protection of Industrial Property, Mar. 20, 1883, 828 U.N.T.S. 305 (revised at Stockholm July 14, 1967) [hereinafter Paris Convention].

2 Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, 828 U.N.T.S. 221 (revised at Paris July 24, 1971) [hereinafter Berne Convention].

3 Thanks in part to John Naisbitt's New York Times bestseller, *Megatrends*, the identification of megatrends was quite popular in the 1980s. The book was first published in 1982, just when the international intellectual property regime was about to undergo a major transformation. JOHN

ramifications of such transformation: (1) the rise of emerging countries; (2) the increased complexity of the international intellectual property regime; and (3) spatial transformation brought about by the proliferation of new technologies. Focusing on the myriad of impacts that changing actors, institutions, and technologies have brought to the international intellectual property regime, this Article discusses each megatrend in turn and explores its significance for the ongoing and future development of the international intellectual property regime.

I. EMERGING COUNTRIES

Many commentators traced the origin of the international intellectual property regime to the European powers' use of bilateral commercial treaties to govern matters in this area.[4] While these conventions strengthened protections for foreign authors and inventors while facilitating cross-border trade by providing a more predictable legal environment,[5] major disruptions such as wars and revolutions caused these treaties to be suspended, revoked, or renegotiated.[6] Establishing an international intellectual property regime was therefore urgent and highly desirable.

For the regime's first few decades, the development of international intellectual property standards involved very limited participation from the developing world.[7] As Ruth Okediji reminds us, colonial powers set

NAISBITT, MEGATRENDS: TEN NEW DIRECTIONS TRANSFORMING OUR LIVES (1982).

[4] For discussions of the use of bilateral commercial treaties to protect foreign authors before the establishment of the Berne Convention, see generally STEPHEN P. LADAS, THE INTERNATIONAL PROTECTION OF LITERARY AND ARTISTIC PROPERTY 43–55 (1938); SAM RICKETSON & JANE C. GINSBURG, INTERNATIONAL COPYRIGHT AND NEIGHBORING RIGHTS: THE BERNE CONVENTION AND BEYOND 27–40 (2d ed. 2006).

[5] In an earlier article, I observed:

> As cross-border markets developed and expanded, countries became concerned about the limited national protection and the virtually nonexistent international protection for foreign authors and inventors. Although foreign creators and inventors could obtain protection as resident aliens, this protection was woefully inadequate, due largely to antiquated law, technical objections, and the lack of an adequate private international law theory. Justice was often unreasonably denied, and the need for stronger international intellectual property protection therefore arose.

Peter K. Yu, *Currents and Crosscurrents in the International Intellectual Property Regime*, 38 LOY. L.A. L. REV. 323, 333–34 (2004) [hereinafter Yu, *Currents and Crosscurrents*] (footnotes omitted).

[6] *See* Sam Ricketson, *The Birth of the Berne Union*, 11 COLUM.-VLA J.L. & ARTS 9, 15 (1986) ("[T]he duration of [bilateral copyright] conventions was uncertain, in that they were linked to some wider treaty of trade or commerce between the countries in question and might suddenly fall to the ground if the latter was revoked or renegotiated.").

[7] *See* RICKETSON & GINSBURG, *supra* note 4, at 883 ("Of the initial signatories of the Berne Act, two can be fairly regarded as falling within the category of what are today called developing countries."); Peter K. Yu, *Caught in the Middle: WIPO and Emerging Economies*, *in* RESEARCH HANDBOOK ON THE WORLD INTELLECTUAL PROPERTY ORGANIZATION: THE FIRST 50 YEARS AND BEYOND 358, 359 (Sam Ricketson ed., 2020) [hereinafter Yu, *Caught in the Middle*] ("While the Berne Convention initially included only Haiti and Tunisia from the developing world, the Paris Convention counted Brazil, Ecuador, El Salvador, Guatemala and Tunisia among its early

up these standards primarily to protect their comparative advantage while extracting resources from colonies.[8] If developing countries were involved in the development of international intellectual property standards, they participated as dependent territories.[9] This form of participation did not change until after the Second World War.

In the two decades immediately following the war, many newly independent countries emerged out of the decolonization movement.[10] These countries cherished the opportunity to exercise their newfound sovereignty to determine whether to succeed to the preexisting international intellectual property obligations that their former colonial masters have entered on their behalf.[11] While some considered withdrawing from the Paris and Berne Conventions, many stayed behind.[12] Some of the latter went even further to demand special concessions that would accommodate their divergent economic, social, cultural, and technological conditions.[13]

developing country members. Sadly, Ecuador, El Salvador and Guatemala withdrew from the Convention in 1886, 1887 and 1895, respectively." (footnotes omitted)).

[8] *See* Ruth L. Okediji, *The International Relations of Intellectual Property: Narratives of Developing Country Participation in the Global Intellectual Property System*, 7 SING. J. INT'L & COMPAR. L. 315, 324 (2003) [hereinafter Okediji, *International Relations*] ("Intellectual property law was not merely an incidental part of the colonial legal apparatus, but a central technique in the commercial superiority sought by European powers in their interactions *with each other* in regions beyond Europe.").

[9] *See* RICKETSON & GINSBURG, *supra* note 4, at 885 ("[I]n the years immediately following [World War II], the process of decolonization brought into existence a large number of new independent states, notably in Africa and Asia. The majority of these had previously been subject to the provisions of the Berne Convention as dependent territories of metropolitan states that were members of the Berne Union."); Peter K. Yu, *A Tale of Two Development Agendas*, 35 OHIO N.U. L. REV. 465, 471 (2009) [hereinafter Yu, *Development Agendas*] ("When the Berne Convention was revised in Brussels in 1948, only India and Pakistan participated as fully independent nations. While other less developed countries were previously subject to the Berne provisions, the Convention applied to them only by virtue of their status 'as dependent territories.'" (footnote omitted)).

[10] *See* Okediji, *International Relations*, *supra* note 8, at 325–34 (providing excellent discussion of how the former colonies conducted their international intellectual property relations following their declarations of independence).

[11] *See* Yu, *Development Agendas*, *supra* note 9, at 470 (noting that the determination of the membership status of international intellectual property agreements "would provide these countries with highly desirable opportunities to exercise their newfound independence and sovereignty"); *see also* CHRISTOPHER MAY, THE WORLD INTELLECTUAL PROPERTY ORGANIZATION: RESURGENCE AND THE DEVELOPMENT AGENDA 22 (2007) (noting that newly independent states were "keen to establish their membership of international society by joining various multilateral agreements and international organizations"); Georges M. Abi-Saab, *The Newly Independent States and the Rules of International Law: An Outline*, 8 HOWARD L.J. 95, 103 (1962) ("For the newly independent states, sovereignty is the hard won prize of their long struggle for emancipation. It is the legal epitome of the fact that they are masters in their own house.").

[12] *See* Yu, *Development Agendas*, *supra* note 9, at 471–72 ("While India, Pakistan, the Philippines, and many former French and Belgian African colonies elected to remain bound by the [Berne] Convention, Indonesia decided to withdraw from the Union.").

[13] *See* Barbara A. Ringer, *The Role of the United States in International Copyright—Past, Present, and Future*, 56 GEO. L.J. 1050, 1065 (1968) (noting that India and other developing countries made these demands during the Stockholm Conference).

The developing countries' push for new international intellectual property standards precipitated the first development agenda,[14] which emerged in the early 1960s and continued well into the early 1980s. This agenda included the drafting of the Protocol Regarding Developing Countries to the Berne Convention (Stockholm Protocol),[15] the formation of the World Intellectual Property Organization (WIPO) as a U.N. specialized agency,[16] the establishment of the draft International Code of Conduct on the Transfer of Technology (TOT Code) under the auspices of the United Nations Conference on Trade and Development (UNCTAD),[17] and the revision of the Paris Convention.[18] While this development agenda helped developing countries garner attention on the significant mismatch between their development needs and existing international intellectual property standards, these countries struggled tremendously to change these standards.

Consider, for example, the developments in the copyright area. Although developing countries managed to push for the adoption of the Stockholm Protocol in the 1967 Intellectual Property Conference of Stockholm,[19] at which both the Paris and Berne Conventions were revised, that protocol was reduced to an optional appendix four years later.[20] Similar challenges arose in the area of technology transfer. In November 1961, Brazil, with the support of other developing countries, introduced before the United Nations General Assembly a draft resolution entitled *The Role of Patents in the Transfer of Technology to Under-Developed Countries*.[21] From the late 1970s to the mid-1980s, developing countries took further advantage of the momentum generated by the New International Economic Order[22] to push for the negotiation of

14 *See* Yu, *Development Agendas*, *supra* note 9, at 468–511 (discussing this agenda).
15 *See id.* at 471–84.
16 *See id.* at 484–93.
17 *See id.* at 493–505.
18 *See id.* at 505–11.
19 Protocol Regarding Developing Countries to the Berne Convention for the Protection of Literary and Artistic Works, July 14, 1967, 828 U.N.T.S. 221, 281. For discussions of the Stockholm Protocol, see generally RICKETSON & GINSBURG, *supra* note 4, at 879–963; Charles F. Johnson, *The Origins of the Stockholm Protocol*, 18 BULL. COPYRIGHT SOC'Y U.S.A. 91 (1970); Dorothy M. Schrader, *Analysis of the Protocol Regarding Developing Countries*, 17 BULL. COPYRIGHT SOC'Y U.S.A. 160 (1970); Yu, *Development Agendas*, *supra* note 9, at 471–84.
20 Berne Convention, *supra* note 2, app.
21 Andréa Koury Menescal, *Changing WIPO's Ways? The 2004 Development Agenda in Historical Perspective*, 8 J. WORLD INTELL. PROP. 761, 765 (2005). The resolution was cosponsored by Argentina, Austria, Bolivia, Chile, Colombia, Costa Rica, Denmark, Ecuador, Iraq, and Nigeria. U.N. Gen. Assembly, *The Role of Patents in the Transfer of Technology to Developing Countries* ¶ 4, U.N. Doc. A/6193 (1965). The resolution was adopted a month later. G.A. Res. 1713 (XVI), The Role of Patents in the Transfer of Technology to Underdeveloped Countries (Dec. 19, 1961).
22 G.A. Res. 3201 (S-VI), Declaration on the Establishment of a New International Economic Order (May 1, 1974). The New International Economic Order "sought to bring about fundamental changes in the international economic system by redistributing power, wealth, and resources from the developed North to the less developed South." Yu, *Development Agendas*, *supra* note 9, at 500.

the TOT Code.[23] This code sought "to eliminate those clauses in transfer of technology contracts which [were] harmful to the economic development of developing countries," as well as other restrictive foreign investment practices.[24] Despite these efforts, the TOT Code remained incomplete and had only a limited impact[25] on the later negotiation of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement).[26] Meanwhile, the developing countries' efforts to revise the Paris Convention ended up with a stalemate.[27] Even today, international transfer of technology remains a highly challenging topic in the international intellectual property area,[28] notwithstanding the technology transfer obligation in the TRIPS Agreement.[29]

During the TRIPS negotiations, a clear North-South divide can be seen between developed and developing countries.[30] While the United States, the European Communities (now the European Union), and Japan

[23] For discussions of the negotiation of this Code, see generally MICHAEL BLAKENEY, LEGAL ASPECTS OF THE TRANSFER OF TECHNOLOGY TO DEVELOPING COUNTRIES 131–61 (1989); INTERNATIONAL TECHNOLOGY TRANSFER: THE ORIGINS AND AFTERMATH OF THE UNITED NATIONS NEGOTIATIONS ON A DRAFT CODE OF CONDUCT (Surendra J. Patel, Pedro Roffe & Abdulqawi Yusuf eds., 2001); SUSAN K. SELL, POWER AND IDEAS: NORTH–SOUTH POLITICS OF INTELLECTUAL PROPERTY AND ANTITRUST 79–106 (1998); Peter K. Yu, *International Technology Contracts, Restrictive Covenants and the UNCTAD Code*, *in* EMPLOYEES, TRADE SECRETS AND RESTRICTIVE COVENANTS 41 (Christopher Heath & Anselm Kamperman Sanders eds., 2017); Yu, *Development Agendas*, *supra* note 9, at 493–505.

[24] Ton J.M. Zuijdwijk, *The UNCTAD Code of Conduct on the Transfer of Technology*, 24 MCGILL L.J. 562, 563 (1978).

[25] *See* Abdulqawi A. Yusuf, *TRIPS: Background, Principles and General Provisions*, *in* INTELLECTUAL PROPERTY AND INTERNATIONAL TRADE: THE TRIPS AGREEMENT 3, 10 & n.19 (Carlos M. Correa & Abdulqawi A. Yusuf eds., 3d ed. 2016) (recounting that some of the provisions in the developing countries' negotiation text "were either directly based on or inspired by those of the Draft International Code of Conduct on the Transfer of Technology which was negotiated under the auspices of UNCTAD but was never adopted as an international instrument" (citation omitted)); Peter K. Yu, *The U.S.-China Forced Technology Transfer Dispute*, 52 SETON HALL L. REV. 1003, 1036 (2022) [hereinafter Yu, *Forced Technology Transfer*] (noting that developing countries "manage[d] to transplant a number of draft provisions of the TOT Code on to the Agreement," which became Articles 7, 8, 31(k), and 40 of the TRIPS Agreement).

[26] 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 [hereinafter TRIPS Agreement].

[27] *See* Pedro Roffe & Gina Vea, *The WIPO Development Agenda in an Historical and Political Context*, *in* THE DEVELOPMENT AGENDA: GLOBAL INTELLECTUAL PROPERTY AND DEVELOPING COUNTRIES 79, 98–105 (Neil Weinstock Netanel ed., 2009) (discussing the revision of the Paris Convention).

[28] *See* Yu, *Forced Technology Transfer*, *supra* note 25, at 1025–39 (discussing the longstanding North-South technology transfer debate).

[29] *See* TRIPS Agreement, *supra* note 26, art. 66.2 (requiring 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 Members in order to enable them to create a sound and viable technological base").

[30] For discussions of the TRIPS negotiations, *see generally* DANIEL GERVAIS, THE TRIPS AGREEMENT: DRAFTING HISTORY AND ANALYSIS 3–27 (3d ed. 2008); THE MAKING OF THE TRIPS AGREEMENT: PERSONAL INSIGHTS FROM THE URUGUAY ROUND NEGOTIATIONS (Jayashree Watal & Antony Taubman eds., 2015) [hereinafter MAKING OF THE TRIPS AGREEMENT]; JAYASHREE WATAL, INTELLECTUAL PROPERTY RIGHTS IN THE WTO AND DEVELOPING COUNTRIES 11–47 (2001); Peter K. Yu, *TRIPS and Its Discontents*, 10 MARQ. INTELL. PROP. L. REV. 369, 371–79 (2006).

worked closely together to develop common positions regarding their preferred international intellectual property standards, developing countries advanced their own negotiating text with the help of UNCTAD and other intergovernmental organizations.[31] The latter's effort had limited success, with only few provisions adopted in the final text of the TRIPS Agreement.[32] Notwithstanding this major setback, developing countries did receive important concessions in other trade areas, such as agriculture and textiles.[33]

Given the developing countries' limited success in pushing for standards that addressed their specific needs and conditions, the TRIPS Agreement included standards that were higher than appropriate for these countries. A 2002 World Bank study estimated that "rent transfers to major technology-creating countries—particularly the United States, Germany, and France—in the form of pharmaceutical patents, computer chip designs, and other intellectual property, would amount to more than $20 billion."[34] Likewise, Keith Maskus observes:

> A reasonable . . . estimate [based on figures UNCTAD provided on setup and training costs in relation to TRIPS implementation] is that [the] average operating costs of an effective system might be perhaps $2.5 million per year for 10 years postreform in those countries that upgrade most rapidly and $1.5 million per year for 20 years in the others. These figures imply that, discounted at 3 percent per annum, the net present value of investment costs in effective enforcement in the developing world would be $4.1 billion over 20 years.[35]

Interestingly, despite these unfavorable conditions, some developing countries managed to improve their economic and technological conditions, due perhaps to the practice of "selective adaptation."[36]

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[31] *See* Daniel J. Gervais, *Intellectual Property, Trade & Development: The State of Play*, 74 FORDHAM L. REV. 505, 508 (2005) (recounting that the Uruguay Round Secretariat "prepar[ed] a 'composite' text, which melded all industrialized countries' proposals into what became the 'A' proposal, while the developing countries' text became the 'B' text" (footnotes omitted)).

[32] *See* Peter K. Yu, *Are Developing Countries Playing a Better TRIPS Game?*, 16 UCLA J. INT'L L. & FOREIGN AFFS. 311, 315–16 (2011) ("In the end, less developed countries only obtained limited concessions in the form of articles 1.1, 7, 8, 40, 41.5, 65, 66, and 67, and some minor adjustments in other provisions.").

[33] *See* WATAL, *supra* note 30, at 44 (noting "the differing expectations of gains in other areas of the Uruguay Round, notably agriculture and textiles"); Yu, *Currents and Crosscurrents*, *supra* note 5, at 385 ("While developed countries received stronger protection for intellectual property rights and a reduction in restrictions against foreign direct investment, less developed countries obtained, in return, lower tariffs on textiles and agriculture and protection against unilateral sanctions imposed by the United States and other developed countries via the mandatory settlement process.").

[34] WORLD BANK, GLOBAL ECONOMIC PROSPECTS AND THE DEVELOPING COUNTRIES 2002: MAKING TRADE WORK FOR THE WORLD'S POOR xvii (2002).

[35] KEITH E. MASKUS, PRIVATE RIGHTS AND PUBLIC PROBLEMS: THE GLOBAL ECONOMICS OF INTELLECTUAL PROPERTY IN THE 21ST CENTURY 227 (2012).

[36] *See generally* Peter K. Yu, *TRIPS and Its Contents*, 60 IDEA 149, 207–15 (2020) (discussing the process of selective adaptation).

Although commentators often single out countries such as Brazil, China, and India—or the so-called "BRICS" countries[37]—for their considerable improvements, many middle-income countries have made considerable progress, though not always to the same extent.[38] One could therefore suggest that the first decade of the TRIPS Agreement has helped precipitated the rise of emerging countries—a phenomenon with which the international intellectual property regime is hitherto unfamiliar.

Consider, for instance, the latest WIPO statistics. In 2022, China (1st), India (12th), Russia (23rd), Brazil (26th), South Africa (34th), Thailand (38th), Malaysia (39th), and Egypt (46th) were ranked among the world's top fifty countries filing international applications under the Patent Cooperation Treaty.[39] With respect to international trademark applications under the Madrid Agreement Concerning the International Registration of Marks and its related protocol, the top fifty countries included China (3rd), Russia (14th), India (22nd), Brazil (38th), Vietnam (39th), Malaysia (40th), and Indonesia (49th).[40] Based on these statistics, one could certainly debate what caused these countries to emerge in the international intellectual property regime—and what role the TRIPS Agreement and other international intellectual property standards have played.[41] Regardless of one's conclusion, the rise of emerging countries—or what I have called "middle intellectual property powers" in prior work[42]—has several significant impacts on the future development of the international intellectual property regime.

First, instead of fostering a binary debate that focuses on the age-old North-South divide, the rise of emerging countries has given the

[37] The BRICS countries include Brazil, Russia, India, China, and South Africa. For the Author's discussions of intellectual property developments in the BRICS countries, see generally Peter K. Yu, *Intellectual Property Negotiations, the BRICS Factor and the Changing North–South Debate*, *in* THE BRICS-LAWYERS' GUIDE TO GLOBAL COOPERATION 148 (Rostam J. Neuwirth, Alexandr Svetlicinii & Denis De Castro Halis eds., 2017) [hereinafter Yu, *Intellectual Property Negotiations*]; Peter K. Yu, *Access to Medicines, BRICS Alliances, and Collective Action*, 34 AM. J.L. & MED. 345, 371–72 (2008) [hereinafter Yu, *Access to Medicines*].

[38] *See generally* Peter K. Yu, *The Middle Intellectual Property Powers*, *in* LAW AND DEVELOPMENT OF MIDDLE-INCOME COUNTRIES: AVOIDING THE MIDDLE-INCOME TRAP 84 (Randall Peerenboom & Tom Ginsburg eds., 2014) (discussing the rise of "middle intellectual property powers").

[39] World Intell. Prop. Org., *Annex 1: International Patent Applications by Origin (PCT System)*, WORLD INTELL. PROP. ORG. (Feb. 10, 2022), https://www.wipo.int/export/sites/www/pressroom/en/documents/pr-2023-899-annexes.pdf [https://perma.cc/D9RM-4UM5].

[40] World Intell. Prop. Org., *Annex 5: International Trademark Applications by Origin (Madrid System)*, WORLD INTELL. PROP. ORG. (Feb. 10, 2022), https://www.wipo.int/export/sites/www/pressroom/en/documents/pr-2023-899-annexes.pdf [https://perma.cc/XTN8-GCN2].

[41] *See* Yu, *Caught in the Middle*, *supra* note 7, at 364 ("[O]ne could debate whether emerging economies would have moved up even more rapidly had that system been better tailored to their needs, interests, conditions and priorities. Nevertheless, there is no denying that many of these economies have greatly benefited from stronger intellectual property protection (along with the many complementary trade policies that were implemented after the formation of, or accession to, the WTO).").

[42] Yu, *The Middle Intellectual Property Powers*, *supra* note 38, at 84.

international intellectual property regime a middle path. This path affects not only the policy choices available to member states but also brings with it unseen or largely underexplored problems.[43] To address these problems, emerging countries have come up with new solutions that draw on their unique conditions and experiences.[44]

Second, the positions taken by emerging countries fluctuate, aligning with those of developing countries sometimes and with those of developed countries at other times.[45] The recent positions taken by China on patent reform is illustrative. Since its "innovative turn" in the mid-2000s,[46] the country has adopted high patent standards that are closer to those found in the United States and other developed countries.[47] The Fourth Amendment to the Patent Law, which China adopted in October 2020 amid the COVID-19 pandemic, provided for the so-called Hatch-Waxman extension, which extended the patent term for up to five years to compensate for the time lost when a pharmaceutical product undergoes regulatory review.[48] Article 76 of the Patent Law, along with the Provisional Measures for the Implementation of Early Resolution Mechanisms for Drug Patent Disputes, further introduced a new patent linkage system that would prevent the marketing approval of the generic version of a patented drug until after the expiration of its patent.[49] In

[43] *See id.* at 98–100 (discussing uneven developments, internal tensions, and continuing piracy and counterfeiting challenges in emerging countries).

[44] *See id.* at 96–98 (discussing the presence of alternative forms of innovation in emerging countries); Yu, *Caught in the Middle*, *supra* note 7, at 364–65 (noting the different policy experiments that emerging economies have conducted to implement the new standards required by the TRIPS Agreement).

[45] *See* Yu, *Intellectual Property Negotiations*, *supra* note 37, at 169 ("Although Brazil, China and India still want to retain leadership in the developing world, they have also sided with developed countries in many negotiations—or at least in the negotiation of many items."); Peter K. Yu, *Five Oft-Repeated Questions About China's Recent Rise as a Patent Power*, 2013 CARDOZO L. REV. DE NOVO 78, 113 [hereinafter Yu, *Five Oft-Repeated Questions*] ("It will indeed be no surprise if China is aligned with the developing world with respect to certain issues, but with the developed world with respect to others.").

[46] *See* Peter K. Yu, *China's Innovative Turn and the Changing Pharmaceutical Landscape*, 51 U. PAC. L. REV. 593, 599–602 (2020) [hereinafter Yu, *China's Innovative Turn*] (discussing China's innovative turn).

[47] *See* Yu, *Five Oft-Repeated Questions*, *supra* note 45, at 113 ("It will . . . be no surprise if China is aligned with the developing world with respect to certain issues, but with the developed world with respect to others."); *see also* Peter K. Yu, *The RCEP and Trans-Pacific Intellectual Property Norms*, 50 VAND. J. TRANSNAT'L L. 673, 722 (2017) ("Although [China, India, and other emerging countries] have yet to embrace the very high protection and enforcement standards found in the European Union, Japan, or the United States, they now welcome standards that are higher than what is currently available in the Asia-Pacific region.").

[48] Zhonghua Renmin Gongheguo Zhuanli Fa (中华人民共和国专利法) [Patent Law of the People's Republic of China] (promulgated by the Standing Comm. Nat'l People's Cong., Mar. 12, 1984, amended Oct. 17, 2020, effective June 1, 2021), art. 42 [hereinafter 2020 Patent Law]; *see also* Drug Price Competition and Patent Term Restoration Act of 1984, Pub. L. No. 98-417, § 201(a), 98 Stat. 1585, 1598–1602 (codified at 35 U.S.C. § 156) (providing a limited extension of the patent term based on the period during which a pharmaceutical product undergoes regulatory review); Yu, *China's Innovative Turn*, *supra* note 46, at 604 (discussing the Hatch-Waxman extension in China).

[49] 2020 Patent Law, *supra* note 48, art. 26; Provisional Measures for the Implementation of Early

addition, the National Medical Products Administration of China released the draft Provisional Measures for the Implementation of Test Data Protection for Pharmaceutical Products in April 2018.[50] Those proposed measures sought to match the U.S. standard by offering twelve years of market exclusivity to undisclosed test or other data for biological products.[51] Thus, even though China remained reluctant to give up its leadership in the developing world,[52] its recent reforms in the patent and pharmaceutical areas shows a growing alignment of the country's intellectual property policies with those of the United States, members of the European Union, and other developed countries.[53]

Finally, the disagreements between emerging countries have upset the coalition dynamics within the WTO and WIPO, thereby disrupting the developing countries' collective resistance to high standards of intellectual property protection and enforcement.[54] A case in point is the recent negotiation of the COVID-19 TRIPS waiver.[55] While India and

Resolution Mechanisms for Drug Patent Disputes (promulgated by the Nat'l Med. Prods. Admin. & China Nat'l Intell. Prop. Admin., July 4, 2021, effective July 4, 2021), http://www.gov.cn/zhengce/zhengceku/2021-07/04/content_5622330.htm [https://perma.cc/6VM4-9WRM] (China).

[50] Yaopin Shiyan Shuju Baohu Shishi Banfa (Zhanxing) (药品试验数据保护实施办法 (暂行)) [Provisional Measures for the Implementation of Test Data Protection for Pharmaceutical Products] (China), https://www.nmpa.gov.cn/directory/web/nmpa/images/uL28qO60qnGt8rU0enKb7dsaO7pMq1yqmw7Leoo6jU3dDQo6mjqNX3xPS4rz7uOWjqS5kb2M=.doc [https://perma.cc/LM8X-AKYN].

[51] *Id.* art. 5; *see also* 42 U.S.C. § 262(k)(7)(A) (providing twelve years of protection to undisclosed test or other data for biological products). *But see* Mark Cohen, *Unpacking the Role of IP Legislation in the Trade War*, CHINA IPR (May 19, 2019), https://chinaipr.com/2019/05/19/unpacking-the-role-of-ip-legislation-in-the-trade-war [https://perma.cc/3END-9FFW] ("There were . . . rumors that China and [the United States Trade Representative] has scaled back regulatory data protection for biologics from the 12 years that had originally been proposed by China in 2018 to the 10 year period provided by the US Mexico Canada Free Trade Agreement.").

[52] *See* Yu, *Intellectual Property Negotiations*, *supra* note 37, at 169 (noting that China "still want[s] to retain leadership in the developing world").

[53] *See* Peter K. Yu, *The Rise of China in the International Intellectual Property Regime*, *in* HANDBOOK ON THE INTERNATIONAL POLITICAL ECONOMY OF CHINA 424, 437 (Zeng Ka ed., 2019) ("[China's] intellectual property model is now aligning more closely with that of developed countries than that of developing countries.").

[54] *See* Yu, *Caught in the Middle*, *supra* note 7, at 368 (noting the addition of a new layer of disagreements between emerging and developing countries over the appropriate international minimum standards for intellectual property protection and enforcement); Yu, *Access to Medicines*, *supra* note 37, at 371–72 ("The growing complexities [in the international intellectual property regime] have . . . upset the existing coalition dynamics between actors and institutions within the international trading system, thus threatening to reduce the bargaining power and influence the less developed world has obtained through past coalition-building initiatives.").

[55] Council for Trade-Related Aspects of Intell. Prop. Rts., *Waiver from Certain Provisions of the TRIPS Agreement for the Prevention, Containment and Treatment of COVID-19: Communication from India and South Africa*, WTO Doc. IP/C/W/669 (Oct. 2, 2020); Council for Trade-Related Aspects of Intell. Prop. Rts., *Waiver from Certain Provisions of the TRIPS Agreement for the Prevention, Containment and Treatment of COVID-19: Revised Decision Text*, WTO Doc. IP/C/W/669/Rev.1 (May 25, 2021). For the Author's discussions of the proposal for the COVID-19 TRIPS waiver and its aftermath, see generally Peter K. Yu, *A Critical Appraisal of the COVID-19 TRIPS Waiver*, *in* INTELLECTUAL PROPERTY RIGHTS IN THE POST PANDEMIC WORLD: AN INTEGRATED FRAMEWORK OF SUSTAINABILITY, INNOVATION AND GLOBAL JUSTICE (Taina E. Pihlajarinne, Jukka Mähönen & Pratyush Upreti eds., forthcoming 2023); Peter K. Yu, *China, the TRIPS Waiver and the Global Pandemic Response*, *in* INTELLECTUAL PROPERTY, COVID-19, AND THE NEXT PANDEMIC: DIAGNOSING PROBLEMS, DEVELOPING CURES (Madhavi Sunder & Sun Haochen eds.,

South Africa, along with sixty countries, supported the suspension of more than thirty provisions of the TRIPS Agreement to facilitate the "prevention, containment or treatment of COVID-19,"[56] several developed countries—notably, the European Union, Switzerland, and the United Kingdom—vehemently opposed the instrument.[57] In the meantime, China was supportive of the waiver, even though it stopped short of endorsing the instrument.[58] By contrast, Brazil joined developed countries in their opposition.[59] The disagreement between emerging countries is particularly problematic when one thinks about the leadership needed to advance debates on key issues at the intersection of intellectual property and development, such as access to medicines. During both the first development agenda[60] and the TRIPS negotiations, India and Brazil provided strong leadership in the effort that pushed back the developed countries' aggressive demands.[61]

forthcoming 2023) [hereinafter Yu, *China, the TRIPS Waiver*]; Peter K. Yu, *The COVID-19 TRIPS Waiver and the WTO Ministerial Decision*, *in* IPR IN TIMES OF CRISIS: LESSONS LEARNED FROM THE COVID-19 PANDEMIC (Jens Schovsbo ed., forthcoming 2023).

56 *See* Carlos M. Correa, Nirmalya Syam & Daniel Uribe, *Implementation of a TRIPS Waiver for Health Technologies and Products for COVID-19: Preventing Claims Under Free Trade and Investment Agreements* 1 (S. Ctr., Research Paper No. 135, 2021) (noting the co-sponsorship of "64 countries from Asia, Africa and Latin America, including the African Group and the least developed countries (LDC) group").

57 *See* D. Ravi Kanth, *EU, Switzerland, UK Continue Opposition, amid Support for TRIPS Waiver*, TWN INFO SERV. ON WTO & TRADE ISSUES (Sept. 16, 2021), https://www.twn.my/title2/wto.info/2021/ti210913.htm [https://perma.cc/66MP-69R9] (reporting that "the European Union led by Germany, Switzerland, and the United Kingdom . . . seem determined to undermine an expeditious decision on the temporary waiver for combating the COVID-19 pandemic"); *see also* Ashleigh Furlong, Sarah Anne Aarup & Samuel Horti, *Who Killed the COVID Vaccine Waiver?*, POLITICO (Nov. 10, 2022), https://www.politico.eu/article/covid-vaccine-poor-countries-waiver-killed/ [https://perma.cc/Z9LE-NEV9] (providing an investigative report on the lobbying against the COVID-19 TRIPS waiver).

58 *See* Council for Trade-Related Aspects of Intell. Prop. Rts., *Minutes of Meeting: Held in the Centre William Rappard on 15–16 October and 10 December 2020*, ¶ 977, WTO Doc. IP/C/M/96/Add.1 (Feb. 16, 2021) ("China is willing to discuss access to commodities in relation to the prevention and control of COVID-19, including medicines and vaccines under the framework of the TRIPS Agreement, and supports the discussions on possible waiver or other emergency measures to respond to the pandemic, which are 'targeted, proportional, transparent and temporary', and which do not create unnecessary barriers to trade or disruption to global supply chains.").

59 *See id.* ¶ 1099 ("At this point in time, we are not convinced that a waiver to the TRIPS Agreement would guarantee us meaningful improvement of access, while it might give the wrong signs to innovators and potentially hinder efforts to produce the solutions we need."). For the Author's discussions of China's global pandemic diplomacy in relation to the COVID-19 TRIPS waiver, see generally Yu, *China, the TRIPS Waiver*, *supra* note 55; Peter K. Yu, *Vaccine Development, the China Dilemma and International Regulatory Challenges*, 55 N.Y.U. J. INT'L L. & POL. (forthcoming 2023).

60 *See* Yu, *Development Agendas*, *supra* note 9, at 505–07 (noting the leadership provided by Brazil and India in the first development agenda).

61 *See* Yu, *Intellectual Property Negotiations*, *supra* note 37, at 153 ("Brazil and India . . . served as key leaders of the developing world."); Peter K. Yu, *The Objectives and Principles of the TRIPS Agreement*, 46 HOUS. L. REV. 979, 987–89 (2009) (noting the opposition from Brazil and India to the inclusion of new substantive intellectual property norms in the General Agreement on Tariffs and Trade).

II. INCREASED REGIME COMPLEXITY

Within the past four decades, the biggest transformation in the international intellectual property regime has been the marriage of intellectual property to trade, which the contributors to this collection of articles have explored.[62] Given the different interests, objectives, and emphases involved in these two areas of international regulation, some commentators have termed the arrangement a "marriage of convenience."[63] To be sure, intellectual property has always had a strong relationship with international trade, and such a relationship dates back to at least the negotiation of bilateral commercial treaties in the early to mid-nineteenth century and the origin of the international intellectual property regime.[64] Nevertheless, the arrival of the TRIPS Agreement has generated greater attention on intellectual property standards in the international trade context.

Article 64 of the TRIPS Agreement mandates the use of the WTO dispute settlement process for resolving disputes arising under the Agreement.[65] Until the creation of the WTO, there was no common mechanism for resolving international intellectual property disputes, and countries resorted to diplomacy and negotiations instead.[66] Although both the Paris and Berne Conventions include an optional mechanism for settling disputes through the International Court of Justice (ICJ),[67] no country has ever used this mechanism to resolve any international intellectual property dispute.[68] The TRIPS Agreement therefore provides a new dispute settlement mechanism for the international intellectual property regime.[69]

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62 *See, e.g.*, Frederick M. Abbott, *100 Years of International IP—Reflections on Past, Present and Future*, 41 CARDOZO ARTS & ENT. L.J. 415 (2023); Rochelle C. Dreyfuss, *The Past and Future in International Patent Law*, 41 CARDOZO ARTS & ENT. L.J. 425 (2023).

63 *See, e.g.*, R. Michael Gadbaw, *Intellectual Property and International Trade: Merger or Marriage of Convenience?*, 22 VAND. J. TRANSNAT'L L. 223 (1989); Joseph Straus, *A Marriage of Convenience: World Economy and Intellectual Property from 1990 to 2012*, 40 AIPLA Q.J. 633 (2012).

64 *See supra* text accompanying notes 4–6.

65 TRIPS Agreement, *supra* note 26, art. 64.

66 *See* Oscar Schachter, *International Law in Theory and Practice*, 178 RECUEIL DES COURS 9, 208 (1982) ("Litigation is uncertain, time consuming, troublesome. Political officials do not want to lose control of a case that they might resolve by negotiation or political pressures. Diplomats naturally prefer diplomacy; political leaders value persuasion, manoeuvre and flexibility.").

67 *See* Berne Convention, *supra* note 2, art. 33(1) (providing the dispute settlement mechanism); Paris Convention, *supra* note 1, art. 28(1) (providing the dispute settlement mechanism).

68 Yu, *Currents and Crosscurrents*, *supra* note 5, at 355.

69 *See* GERVAIS, *supra* note 30, at 10 (describing "the absence of a binding and effective dispute settlement mechanism (for disputes between states)" as a fundamental perceived flaw of the Paris and Berne Conventions); Peter K. Yu, *International Enclosure, the Regime Complex, and Intellectual Property Schizophrenia*, 2007 MICH. ST. L. REV. 1, 9 [hereinafter Yu, *Regime Complex*] (noting that the WTO's mandatory dispute settlement process "has greatly improved the enforceability of international intellectual property treaties, which hitherto have been virtually unenforceable").

More importantly, WTO panels and the Appellate Body tend to focus more on the trade bottom line than the balance in the intellectual property system,[70] even though many panel and Appellate Body members were involved in TRIPS negotiations or in other international or regional intellectual property discussions.[71] For example, Rochelle Dreyfuss criticizes the WTO panel in *Canada—Patent Protection of Pharmaceutical Products* for failing to "directly conside[r] the public welfare goals that Canada was seeking to promote."[72] She is also disappointed that the panel in *United States—Section 110(5) of the US Copyright Act* construed the three-step test in a way that "le[ft] no room for consideration of the public interest."[73] Likewise, Robert Howse condemns the former panel for being "only interested in how much the rights holder might lose, not in how much society might gain, from a given exception."[74] Bernt Hugenholtz and Ruth Okediji further lament that the WTO's view of "IP protection . . . through its impact on free trade . . . [has] provide[d] a distinct gloss on the interpretation of TRIPS obligations that often disregards cultural and other relevant criteria central to both national and international copyright systems."[75]

While the linkage of intellectual property to trade has transformed the international intellectual property regime considerably, this regime has also interacted with, and encountered pressures or intrusions from,

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[70] *See* Daniel J. Gervais, *How Intellectual Property and Human Rights Can Live Together: An Updated Perspective*, *in* INTELLECTUAL PROPERTY LAW AND HUMAN RIGHTS 3, 12 (Paul L.C. Torremans ed., 4th ed. 2020) ("Exceptions to copyright are seen through a trade-related effects-based prism."); Peter K. Yu, *The Second Transformation of the International Intellectual Property Regime*, *in* GLOBAL INTELLECTUAL PROPERTY PROTECTION AND NEW CONSTITUTIONALISM: HEDGING EXCLUSIVE RIGHTS 176, 179 (Jonathan Griffiths & Tuomas Mylly eds., 2021) [hereinafter NEW CONSTITUTIONALISM] ("[T]he TRIPS Agreement has put a heavy trade gloss on international IP [intellectual property] norms."); Ruth L. Okediji, *Public Welfare and the Role of the WTO: Reconsidering the TRIPS Agreement*, 17 EMORY INT'L L. REV. 819, 914–15 (2003) (expressing disappointment that WTO panels, despite focusing on the purpose and objective of the TRIPS Agreement and the context of the negotiations, "have interpreted the provisions almost solely in light of the economic expectations of the private right holders"); Peter K. Yu, *Intellectual Property and Human Rights in the Nonmultilateral Era*, 64 FLA. L. REV. 1045, 1083–84 (2012) [hereinafter Yu, *Nonmultilateral Era*] (noting that the views taken by intellectual property rights holders and their supportive governments "are often colored by the trade-based—and at times, trade-only—approach developed through the founding of the WTO and the adoption of the TRIPS Agreement").

[71] The three panelists involved in *China—Measures Affecting the Protection and Enforcement of Intellectual Property Rights* were "Adrian Macey, a New Zealand diplomat who was involved in the [TRIPS negotiations,] . . . Marino Porzio, a Chilean lawyer who served as WIPO Deputy Director-General during 1980–1987, and the late Sivakant Tiwari, a Singaporean government attorney who chaired the APEC Intellectual Property Rights Experts' Group." Peter K. Yu, *The TRIPS Enforcement Dispute*, 89 NEB. L. REV. 1046, 1055 (2011).

[72] Rochelle C. Dreyfuss, *Hedging Bets with BITS: The Impact of Investment Obligations on Intellectual Property Norms*, *in* NEW CONSTITUTIONALISM, *supra* note 70, at 157, 160.

[73] *Id.*

[74] Robert Howse, *The Canadian Generic Medicines Panel: A Dangerous Precedent in Dangerous Times*, 3 J. WORLD INTELL. PROP. 493, 496 (2000).

[75] P. Bernt Hugenholtz & Ruth L. Okediji, *Contours of an International Instrument on Limitations and Exceptions*, *in* THE DEVELOPMENT AGENDA: GLOBAL INTELLECTUAL PROPERTY AND DEVELOPING COUNTRIES 491 (Neil Weinstock Netanel ed., 2008).

other issue areas. For instance, the past decade has seen policymakers and commentators paying growing attention to the arrival of international investment law.[76] Although intellectual property has been included in international investment agreements long before the adoption of the TRIPS Agreement and the debate on intellectual property and development has always surrounded issues relating to foreign direct investment,[77] the growing use of investor-state dispute settlement (ISDS) has brought investment standards into the international intellectual property regime. Among the most notable ISDS cases in this area are complaints brought by Philip Morris against Australia and Uruguay,[78] Eli Lilly against Canada,[79] Bridgestone against Panama,[80] and the Einarssons and Geophysical Service Inc. against Canada.[81]

It remains to be seen how international investment standards will impact the international intellectual property regime, especially considering that multinational intellectual property rights holders have slowed down the use of ISDS since the COVID-19 pandemic.[82] Nevertheless, there remain concerns that arbitrators who are charged with evaluating ISDS claims will subscribe to a narrow view of intellectual property that "focus[es] primarily on the protection levels without adequately considering the corresponding limitations or exceptions."[83]

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[76] For book-length treatments of the interplay of intellectual property and investment law, see generally SIMON KLOPSCHINSKI, CHRISTOPHER S. GIBSON & HENNING GROSSE RUSE-KHAN, THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS UNDER INTERNATIONAL INVESTMENT LAW (2021); EMMANUEL KOLAWOLE OKE, THE INTERFACE BETWEEN INTELLECTUAL PROPERTY AND INVESTMENT LAW: AN INTERTEXTUAL ANALYSIS (2021); RESEARCH HANDBOOK ON INTELLECTUAL PROPERTY AND INVESTMENT LAW (Christophe Geiger ed., 2020); PRATYUSH NATH UPRETI, INTELLECTUAL PROPERTY OBJECTIVES IN INTERNATIONAL INVESTMENT AGREEMENTS (2022); LUKAS VANHONNAEKER, INTELLECTUAL PROPERTY RIGHTS AS FOREIGN DIRECT INVESTMENTS: FROM COLLISION TO COLLABORATION (2015).

[77] *See* Peter K. Yu, *The Investment-Related Aspects of Intellectual Property Rights*, 66 AM. U. L. REV. 829, 837–39 (2017) [hereinafter Yu, *Investment-Related Aspects*] (pointing out that intellectual property has been linked to foreign investment as early as the 1960s).

[78] Philip Morris Asia Ltd. v. Commonwealth of Austl., PCA Case No. 2012-12, Award on Jurisdiction and Admissibility (Dec. 17, 2015); Philip Morris Brands Sàrl v. Oriental Republic of Uru., ICSID Case No. ARB/10/7, Award (July 8, 2016).

[79] Eli Lilly & Co. v. Gov't of Can., ICSID Case No. UNCT/14/2, Final Award (Mar. 16, 2017).

[80] Bridgestone Licensing Servs., Inc. v. Republic of Pan., ICSID Case No. ARB/16/34, Award (Aug. 14, 2020).

[81] Einarsson v. Gov't of Can., ICSID Case No. UNCT/20/6, Notice of Arbitration (Apr. 18, 2019), https://www.italaw.com/sites/default/files/case-documents/italaw11478_0.pdf [https://perma.cc/9BLL-PCW3].

[82] *See* Peter K. Yu, *The Changing Chemistry Between Intellectual Property and Investment Law*, *in* IMPROVING INTELLECTUAL PROPERTY: A GLOBAL PROJECT 405, 411 (Susy Frankel, Margaret Chon, Graeme B. Dinwoodie, Barbara Lauriat & Jens Schovsbo eds., 2023) [hereinafter Yu, *Changing Chemistry*] ("Although investor-state disputes over COVID-19 relief measures have already surfaced in developing countries, no new ISDS complaint has been filed in the intellectual property area."). *See generally* Rochelle Cooper Dreyfuss, *ISDS and Intellectual Property in 2020—Protecting Public Health in the Age of Pandemics*, *in* YEARBOOK ON INTERNATIONAL INVESTMENT LAW & POLICY 2020, at 206 (Lisa E. Sachs, Lise J. Johnson & Jesse Coleman eds., 2022) (discussing intellectual property–related investor-state disputes in the pandemic context).

[83] Yu, *Investment-Related Aspects*, *supra* note 77, at 857; *see also* Yu, *Changing Chemistry*, *supra* note 82, at 410 (noting that "ISDS arbitrators tend to overemphasize intellectual property rights as

These arbitrators may also overlook the contingent nature of intellectual property rights.[84] In addition, commentators have identified many structural weaknesses and procedural shortcomings in the ISDS mechanism.[85] Some commentators also lament the increased "assetization"[86] or "investmentization" of intellectual property.[87]

Apart from the interplay of intellectual property, international trade, and investment law, there has been increased engagement between intellectual property and human rights.[88] Since WIPO and the U.N. High Commissioner for Human Rights cosponsored an event on intellectual property and human rights[89] to commemorate the fiftieth anniversary of the Universal Declaration of Human Rights,[90] commentators have paid greater attention at this intersectional area. For example, shortly after the expiration of the TRIPS transition period for developing countries, the High Commissioner issued a highly critical report highlighting the shortcomings of the TRIPS Agreement.[91] The U.N. Sub-Commission on the Promotion and Protection of Human Rights issued two resolutions calling for the use of the principle of human rights primacy to ensure that human rights obligations prevail over intellectual property commitments.[92] In the past two decades, the U.N. Committee on

investors' rights").

[84] As Professor Okediji observes:

> [A]ll intellectual property rights are to some extent contingent rights only; whether a claimant is a rightful owner, has complied with national eligibility standards for protection, whether there are any applicable subject-matter limits or supervening policy considerations, or whether a granting agency has appropriately granted (or denied) such rights are always subject to question before national courts.

Ruth L. Okediji, *Is Intellectual Property "Investment"?* Eli Lilly v. Canada *and the International Intellectual Property System*, 35 U. PA. J. INT'L L. 1121, 1126 (2014); *see also* Yu, *Investment-Related Aspects*, *supra* note 77, at 881 ("[I]t is . . . important to recall the contingent nature of intellectual property rights. Just because these rights have been granted does not mean that they can be enforced through the international investment agreement.").

[85] *See* Yu, *Investment-Related Aspects*, *supra* note 77, at 851–64 (identifying these deficiencies). *See generally* Peter K. Yu, *The Pathways of Multinational Intellectual Property Dispute Settlement*, *in* INTELLECTUAL PROPERTY AND INTERNATIONAL DISPUTE RESOLUTION 123 (Christopher Heath & Anselm Kamperman Sanders eds., 2019) (comparing investor-state dispute settlement with state-to-state dispute settlement under the WTO Dispute Settlement Body).

[86] Rochelle Dreyfuss & Susy Frankel, *From Incentive to Commodity to Asset: How International Law Is Reconceptualizing Intellectual Property*, 36 MICH. J. INT'L L. 557, 560 (2015).

[87] UPRETI, *supra* note 76, at 9.

[88] *See* Peter K. Yu, *Intellectual Property and Human Rights 2.0*, 53 U. RICH. L. REV. 1375, 1383–99 (2019) (reviewing the literature on the interplay of intellectual property and human rights).

[89] *See generally* WORLD INTELL. PROP. ORG., INTELLECTUAL PROPERTY AND HUMAN RIGHTS (1999) (providing the proceedings of the "Intellectual Property and Human Rights" panel).

[90] G.A. Res. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948).

[91] U.N. Econ. & Soc. Council, Sub-Comm'n on the Promotion & Prot. of Hum. Rts., *The Impact of the Agreement on Trade-Related Aspects of Intellectual Property Rights on Human Rights: Report of the High Commissioner*, U.N. Doc. E/CN.4/ Sub.2/2001/13 (June 27, 2001); *see also* Yu, *Nonmultilateral Era*, *supra* note 70, at 1084–86 (discussing the High Commissioner's report).

[92] Sub-Commission on Human Rights Res. 2001/21, Intellectual Property and Human Rights, ¶ 3, U.N. Doc. E/CN.4/Sub.2/RES/2001/21 (Aug. 16, 2001) (requesting governments "to take international human rights obligations and principles fully into account in international economic policy formulation" in national, regional and international economic policy forums); Sub-

Economic, Social and Cultural Rights issued authoritative interpretive comments on the right to the protection of interests resulting from intellectual productions,[93] the right to take part in cultural life,[94] and the right to enjoy the benefits of scientific progress and its applications.[95] In addition, the Special Rapporteur in the Field of Cultural Rights[96] and the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression have released reports expressing concerns about the overprotection of intellectual property rights.[97]

All of these resolutions and publications have direct relevance to the development of the international intellectual property regime. Consider, for instance, the latest interpretive comment on the right to science issued by the U.N. Committee on Economic, Social and Cultural Rights. This comment identified three areas that intellectual property law and policy has had a negative impact on the protection, fulfillment, and realization of the right to enjoy the benefits of scientific progress and its applications:

> Firstly, intellectual property can sometimes create distortions in the funding of scientific research as private financial support might go only to research projects that are profitable, while funding to address issues that are crucial for economic, social and cultural rights might not be adequate, as these issues do not seem financially attractive for business. This has been the case with the so-called neglected diseases. Second, some intellectual property regulations limit the sharing of information on scientific research for a certain period, as is the case with data exclusivity for patent holders included in some of the "[TRIPS]-plus" treaties.

Commission on Human Rights Res. 2000/7, Intellectual Property Rights and Human Rights, ¶ 3, U.N. Doc. E/CN.4/Sub.2/RES/2000/7 (Aug. 17, 2000) (emphasizing "the primacy of human rights obligations over economic policies and agreements").

93 Comm. on Econ., Soc. & Cultural Rts., *General Comment No. 17: The Right of Everyone to Benefit from the Protection of the Moral and Material Interests Resulting from Any Scientific, Literary or Artistic Production of Which He or She Is the Author (Article 15, Paragraph 1(c), of the Covenant)*, U.N. Doc. E/C.12/GC/17 (Jan. 12, 2006).

94 Comm. on Econ., Soc. & Cultural Rts., *General Comment No. 21: Right of Everyone to Take Part in Cultural Life (Art. 15, Para. 1(a), of the International Covenant on Economic, Social and Cultural Rights)*, U.N. Doc. E/C.12/GC/21 (Dec. 21, 2009).

95 Comm. on Econ., Soc. & Cultural Rts., *General Comment No. 25 (2020) on Science and Economic, Social and Cultural Rights (Article 15(1)(b), (2), (3) and (4) of the International Covenant on Economic, Social and Cultural Rights)*, U.N. Doc. E/C.12/GC/25 (Apr. 30, 2020) [hereinafter *General Comment No. 25*].

96 Farida Shaheed (Special Rapporteur in the Field of Cultural Rights), *Copyright Policy and the Right to Science and Culture*, U.N. Doc. A/HRC/28/57 (Dec. 24, 2014); Farida Shaheed (Special Rapporteur in the Field of Cultural Rights), *Cultural Rights*, U.N. Doc. A/70/279 (Aug. 4, 2015); Farida Shaheed (Special Rapporteur in the Field of Cultural Rights), *The Right to Enjoy the Benefits of Scientific Progress and Its Applications*, U.N. Doc. A/HRC/20/26 (May 14, 2012).

97 *See* Frank La Rue (Special Rapporteur on the Promotion & Prot. of the Right to Freedom of Opinion & Expression), *Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression*, ¶ 78, U.N. Doc. A/HRC/17/27 (May 16, 2011) ("The Special Rapporteur considers cutting off users from Internet access, regardless of the justification provided, including on the grounds of violating intellectual property rights law, to be disproportionate and thus a violation of article 19, paragraph 3, of the International Covenant on Civil and Political Rights.").

> Furthermore, the excessive price of some scientific publications is an obstacle for low-income researchers, especially in developing countries. All those restrictions hinder the advancement of science. Third, although intellectual property provides positive incentives for new research activities and thus plays an important role in contributing to innovation and the development of science, it may, in some cases, pose significant obstacles for persons wishing to access the benefits of scientific progress, which may be crucial for the enjoyment of other economic, social and cultural rights, such as the right to health.[98]

Another issue area that has impacted the development of the international intellectual property regime is biological diversity.[99] Both the Convention on Biological Diversity[100] and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization[101] have received growing attention from intellectual property policymakers and commentators. Building on the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of Their Utilization, developing countries demanded the greater disclosure in patent applications of the origin of the biological resources and traditional knowledge used in inventions.[102] Such disclosure led to the introduction of the proposal to amend the TRIPS Agreement by adding a new Article 29*bis*.[103] Some member states have also introduced legislation supporting such disclosure.[104]

The issue of biological diversity also ties well into the ongoing discussion of the need for greater protection of genetic resources,

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98 *General Comment No. 25*, *supra* note 95, ¶ 61.

99 *See generally* Yu, *Development Agendas*, *supra* note 9, at 529–34 (discussing the interplay of intellectual property and biological diversity).

100 Convention on Biological Diversity, June 5, 1992, 1760 U.N.T.S. 143.

101 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity, Oct. 29, 2010, http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf [https://perma.cc/ZG6U-5ZVK]; *see also* SAM F. HALABI, INTELLECTUAL PROPERTY AND THE NEW INTERNATIONAL ECONOMIC ORDER: OLIGOPOLY, REGULATION, AND WEALTH REDISTRIBUTION IN THE GLOBAL KNOWLEDGE ECONOMY 175–84 (2018) (discussing this protocol as an intellectual property shelter).

102 *See* SECRETARIAT OF THE CONVENTION ON BIOLOGICAL DIVERSITY, BONN GUIDELINES ON ACCESS TO GENETIC RESOURCES AND FAIR AND EQUITABLE SHARING OF THE BENEFITS ARISING OUT OF THEIR UTILIZATION ¶ 16(d)(2) (2002), https://www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf [https://perma.cc/P4L7-49XW] (stating that contracting Parties "could consider . . . measures to encourage the disclosure of the country of origin of the genetic resources and of the origin of traditional knowledge, innovations and practices of indigenous and local communities in applications for intellectual property rights").

103 Communication from Brazil, China, Colombia, Cuba, India, Pakistan, Peru, Thailand, and Tanzania, Doha Work Programme—The Outstanding Implementation Issue on the Relationship Between the TRIPS Agreement and the Convention on Biological Diversity, WTO Doc. WT/GC/W/564/Rev.2 (July 5, 2006).

104 *See, e.g.*, 2020 Patent Law, *supra* note 48, art. 26 (requiring the disclosure in patent applications of the origin of the biological resources and traditional knowledge used in inventions).

traditional knowledge, and traditional cultural expressions.[105] Since its establishment in September 2000, the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore has engaged in discussions of the development of appropriate instruments to offer protection in this area.[106] These longstanding discussions eventually led to an agreement by the WIPO membership in July 2022 to hold a diplomatic conference to consider the Draft International Legal Instrument Relating to Intellectual Property, Genetic Resources and Traditional Knowledge Associated with Genetic Resources.[107]

The brevity of this section does not allow for a comprehensive exploration of all the different issue areas that have affected the development of the international intellectual property regime. Nevertheless, with the COVID-19 pandemic gradually transitioning to an endemic,[108] it is not difficult to see the immediate connection between intellectual property and public health, which has been extensively discussed in intellectual property literature.[109] The ongoing effort to create an international treaty on pandemics under the auspices of the World Health Organization (WHO) will have a direct impact on the protection of intellectual property in the public health context.[110] There

105 For the Author's discussions of traditional knowledge and traditional cultural expressions, see generally Peter K. Yu, *Cultural Relics, Intellectual Property, and Intangible Heritage*, 81 TEMP. L. REV. 433 (2008); Peter K. Yu, *Traditional Knowledge, Intellectual Property, and Indigenous Culture: An Introduction*, 11 CARDOZO J. INT'L & COMPAR. L. 239 (2003). For a collection of articles from the first academic symposium on traditional knowledge and traditional cultural expressions in an U.S. law school, see generally Symposium, *Traditional Knowledge, Intellectual Property, and Indigenous Culture*, 11 CARDOZO J. INT'L & COMPAR. L. 239 (2003).

106 *See Intergovernmental Committee (IGC)*, WORLD INTELL. PROP. ORG., http://www.wipo.int/tk/en/igc [https://perma.cc/C86X-RDXB]. *See generally* PROTECTING TRADITIONAL KNOWLEDGE: THE WIPO INTERGOVERNMENTAL COMMITTEE ON INTELLECTUAL PROPERTY AND GENETIC RESOURCES, TRADITIONAL KNOWLEDGE AND FOLKLORE (Daniel F. Robinson, Ahmed Abdel-Latif & Pedro Roffe eds., 2017) (collecting articles that offer detailed analyses of the Intergovernmental Committee's effort).

107 Press Release, World Intell. Prop. Org., WIPO Member States Approve Diplomatic Conferences for Two Proposed Accords Geneva (July 21, 2022).

108 *See* Lara Herrero & Eugene Madzokere, *COVID Will Likely Shift from Pandemic to Endemic—but What Does That Mean?*, CONVERSATION (Sept. 20, 2021), https://theconversation.com/covid-will-likely-shift-from-pandemic-to-endemic-but-what-does-thatmean-167782 [https://perma.cc/5XBF-SVL8]; Nicky Phillips, *The Coronavirus Is Here to Stay—Here's What That Means*, NATURE (Feb. 16, 2021), https://www.nature.com/articles/d41586-021-00396-2 [https://perma.cc/GTM6-XV7V].

109 *See, e.g.*, CYNTHIA M. HO, ACCESS TO MEDICINE IN THE GLOBAL ECONOMY: INTERNATIONAL AGREEMENTS ON PATENTS AND RELATED RIGHTS (2011); NEGOTIATING HEALTH: INTELLECTUAL PROPERTY AND ACCESS TO MEDICINES (Pedro Roffe, Geoff Tansey & David Vivas-Eugui eds., 2006); THE GLOBAL GOVERNANCE OF HIV/AIDS: INTELLECTUAL PROPERTY AND ACCESS TO ESSENTIAL MEDICINES (Obijiofor Aginam, John Harrington & Peter K. Yu eds., 2013).

110 *See generally* Fernando dos Santos, Caroline B. Ncube & Marisella Ouma, *Intellectual Property Framework Responses to Health Emergencies—Options for Africa*, 118 S. AFR. J. SCI. 12775, at 4 (2022); Obijiofor Aginam, *The Proposed Pandemic Treaty and the Challenge of the South for a Robust Diplomacy* (S. Ctr., SouthViews No. 218, 2021); Germán Velásquez & Nirmalya Syam, *A New WHO International Treaty on Pandemic Preparedness and Response: Can It Address the*

has also been considerable cooperation between institutions in these two related issue areas. During the pandemic, WIPO collaborated with the WTO and the WHO to release a revised trilateral study on access to medical technologies and innovation.[111] In December 2022, the three intergovernmental organizations held a joint technical symposium to "examine the challenges of the COVID-19 pandemic and discuss possible ways forward within the health, [intellectual property] and trade frameworks."[112] These joint efforts dovetailed WIPO's work at the intersection of intellectual property and public health, including an important patent landscape report on COVID-19-related vaccines and therapeutics.[113]

The foregoing discussion has shown the increased complexity of the international intellectual property regime. Instead of technical issues found in the Paris and Berne Conventions, policymakers and commentators now engage with issues lying in intersectional areas. Such increased complexity has influenced the regime's ongoing and future development in three ways.

First, increased complexity brings to the international intellectual property debate new actors, institutions, issues, values, and vocabularies.[114] Such complexity not only creates opportunities for cross-fertilization between regulatory standards in different regimes[115] but also raises the prospects of negative regulatory impact.[116] Gone are the days when intellectual property policymakers and commentators can focus solely on technical issues, such as the rule of the shorter term in copyright

Needs of the Global South? (S. Ctr., Policy Brief No. 93, 2021).

111 WORLD HEALTH ORG., WORLD INTELL. PROP. ORG. & WORLD TRADE ORG., PROMOTING ACCESS TO MEDICAL TECHNOLOGIES AND INNOVATION: INTERSECTIONS BETWEEN PUBLIC HEALTH, INTELLECTUAL PROPERTY AND TRADE (2d ed. 2020).

112 *WHO, WIPO, WTO Joint Technical Symposium on the COVID-19 Pandemic: Response, Preparedness, Resilience*, WORLD INTELL. PROP. ORG., https://www.wipo.int/meetings/en/2022/wipo-wto-who-technical-symposium.html [https://perma.cc/X8HK-9FP7].

113 WORLD INTELL. PROP. ORG., COVID-19-RELATED VACCINES AND THERAPEUTICS PRELIMINARY INSIGHTS ON RELATED PATENTING ACTIVITY DURING THE PANDEMIC (2022).

114 *See* JOHN BRAITHWAITE & PETER DRAHOS, GLOBAL BUSINESS REGULATION 565 (2000) ("Each international organization has different rules by which it operates and so offers different games and different pay-offs."); UPRETI, *supra* note 76, at 15, 54 (noting that "IP law has its own institutions, rationale, flexibilities and standards" and that "international investment law has its own rationale, struggles and principles"); Yu, *Regime Complex*, *supra* note 69, at 16–17 (noting the emergence of new actors and institutions in a regime complex and the incorporation of new issue areas).

115 *See* Cynthia M. Ho, *A Collision Course Between TRIPS Flexibilities and Investor-State Proceedings*, 6 U.C. IRVINE L. REV. 395, 464 (2016) ("[I]increased awareness and cross-fertilization in the investment arena of TRIPS norms would be desirable."); Peter K. Yu, *Crossfertilizing ISDS with TRIPS*, 49 LOY. U. CHI. L.J. 321 (2017) (advocating for the cross-fertilization of investor-state dispute settlement with the WTO system).

116 As Kal Raustiala observes: "[N]ew international rules and institutions are rarely negotiated on a clean slate. As a result rulemakers are not able to choose any substantive legal rule(s) they might favor; frequently they are limited by the existing constellation of rules and, most importantly, the political interests these rules have engendered." Kal Raustiala, *Density and Conflict in International Intellectual Property Law*, 40 U.C. DAVIS L. REV. 1021, 1026 (2007).

law[117] or the working requirement in patent law.[118] Instead, they now have to tackle broader intersectional issues, such as what public international law principles are applicable when addressing issues lying at the intersection of intellectual property and international trade,[119] what legitimate expectations an intellectual property right holder should have over its investments,[120] or how intellectual property–irrelevant issues can impact access to COVID-19 vaccines.[121]

Second, the constant interactions between the different international regimes have resulted in the creation of an "intellectual property regime complex,"[122] which can be defined as a large international regulatory framework that "includes both the traditional international intellectual property regime and those other international regimes or fora in which intellectual property issues play a growing role or with which formal or informal linkages have been established."[123] This regime complex enables countries to practice "regime shifting"[124] by moving norm-setting activities from a disadvantageous forum to a more favorable one.[125]

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117 *See* Berne Convention, *supra* note 2, art. 7(8) ("[T]he term shall be governed by the legislation of the country where protection is claimed; however, unless the legislation of that country otherwise provides, the term shall not exceed the term fixed in the country of origin of the work.").

118 *See* Paris Convention, *supra* note 1, art. 5A (providing rules governing the working of a patent).

119 *See* Peter K. Yu, *Teaching International Intellectual Property Law*, 52 ST. LOUIS U. L.J. 923, 929–30 (2008) (noting the increasing importance of public international law concepts and tools in the intellectual property context).

120 *See generally* KLOPSCHINSKI, GIBSON & GROSSE RUSE-KAHN, *supra* note 76, at 328–47 (discussing reasonable reliance on legitimate expectations in the intellectual property context); UPRETI, *supra* note 76, at 80–83 (discussing the protection of legitimate expectations in investor-state disputes in the intellectual property area).

121 *See* Francis Gurry, *Some Considerations on Intellectual Property, Innovation, Access and COVID-19*, ¶ 10, WORLD INTELL. PROP. ORG. (Apr. 24, 2020), https://www.wipo.int/about-wipo/en/dg_gurry/news/2020/news_0025.html [https://perma.cc/L8LF-BP34] (noting the "many . . . policy challenges in the management of the COVID-19 crisis that are not directly related to IP and innovation" and that do not involve the "question of IP blocking access to vital medical vaccines, treatments or cures"); *see also* Peter K. Yu, *The International Enclosure Movement*, 82 IND. L.J. 827, 853 (2007) (noting the need "to distinguish among the IP-relevant, IP-related, and IP-irrelevant factors and develop solutions that are tailored to each type of factor").

122 Yu, *Regime Complex*, *supra* note 69, at 13 (coining the term). The term "regime complex" was coined by Kal Raustiala and David Victor. Kal Raustiala & David G. Victor, *The Regime Complex for Plant Genetic Resources*, 58 INT'L ORG. 277, 279 (2004); *see also* Raustiala, *supra* note 116, at 1025 (defining a regime complex as "a collective of partially overlapping and even inconsistent regimes that are not hierarchically ordered, and which lack a centralized decisionmaker or adjudicator").

123 Yu, *Regime Complex*, *supra* note 69, at 14.

124 For discussions of "forum shifting" or "regime shifting" strategies, see generally BRAITHWAITE & DRAHOS, *supra* note 114, at 564–71; Laurence R. Helfer, *Regime Shifting: The TRIPs Agreement and New Dynamics of International Intellectual Property Lawmaking*, 29 YALE J. INT'L L. 1 (2004); Yu, *Currents and Crosscurrents*, *supra* note 5, at 408–16.

125 *See* Helfer, *supra* note 124, at 14 (defining regime shifting as "an attempt to alter the status quo ante by moving treaty negotiations, lawmaking initiatives, or standard setting activities from one international venue to another" (footnote omitted)); *see also* Raustiala, *supra* note 116, at 1027 ("Increasingly, international actors—not only states but also firms and civil society groups—seek to use different fora to develop and elaborate international IP rules. Because these fora have different rules of access, membership, and participation, they empower and disempower distinct actors." (footnote omitted)).

Although such activities can help developing countries create "counterregime norms"[126] and strategic inconsistencies, many commentators agree that such regime-shifting activities, and the resulting fragmentation of the international regulatory system, will hurt more than help developing countries.[127] As Eyal Benvenisti and George Downs observe:

> First, [fragmentation] limits the ability of weaker states to engage in the logrolling that is necessary for them to bargain more effectively with more powerful states. . . . Second, by creating a multitude of competing institutions with overlapping responsibilities, fragmentation provides powerful states with the opportunity to abandon—or threaten to abandon—any given venue for a more sympathetic venue if their demands are not met. . . . Third, a fragmented system's piecemeal character suggests an absence of design and obscures the role of intentionality. . . . This has helped obscure the fact that fragmentation is in part the result of a calculated strategy by powerful states to create a legal order that both closely reflects their interests and that only they have the capacity to alter.[128]

After all, countries, especially those in the developing world, face resource constraints in undertaking negotiations in multiple fora—be it intellectual property, international trade, investment law, or public health.[129]

Third, increased complexity has created tensions and conflicts between regulatory standards within each distinct international regime.[130]

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126 *See* Donald J. Puchala & Raymond F. Hopkins, *International Regimes: Lessons from Inductive Analysis*, *in* INTERNATIONAL REGIMES 61, 66 (Stephen D. Krasner ed., 1983) (defining "counterregime norms" as norms that "either circulate in the realm of rhetoric or lie dormant as long as those who dominate the existing regime preserve their power and their consequent ability to reward compliance and punish deviance"); Helfer, *supra* note 124, at 14 (defining "counter-regime norms" as "binding treaty rules and nonbinding soft law standards that seek to alter the prevailing legal landscape").

127 *See* Raustiala, *supra* note 116, at 1027–28 (noting that "'strategic inconsistency' occurs when actors deliberately seek to create inconsistency via a new rule crafted in another forum in an effort to alter or put pressure on an earlier rule").

128 Eyal Benvenisti & George W. Downs, *The Empire's New Clothes: Political Economy and the Fragmentation of International Law*, 60 STAN. L. REV. 595, 597–98 (2007). *See generally* Int'l L. Comm'n, *Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law: Report of the Study Group of the International Law Commission*, U.N. Doc. A/CN.4/L.682 (Apr. 13, 2006) (prepared by Martti Koskenniemi) (discussing the impact of fragmentation on international law).

129 *See* Yu, *Nonmultilateral Era*, *supra* note 70, at 1089 ("[N]ot every country has the ability to undertake discussions in a multitude of fora—in this case, in both intellectual property and human rights fora and in both multilateral and nonmultilateral fora."); Peter K. Yu, *Sinic Trade Agreements*, 44 U.C. DAVIS L. REV. 953, 977 (2011) ("[C]ountries—especially those in the less-developed world—have very limited resources. As a result, they may not have the ability to dedicate efforts to normmaking in a multitude of competing fora." (footnote omitted)).

130 *See* Raustiala, *supra* note 116, at 1024 ("As the number of institutions within the international system grows—and with new international agreements, new organizations, and new actors increasingly engaged in varied aspects of global governance—it is inevitable that some of these agreements, organizations, and actors will overlap and even conflict with one another.").

Such complexity also leads countries to develop incoherent policies. For example, in the area of traditional knowledge and traditional cultural expressions, those countries embracing high intellectual property standards will want lower standards, due in large part to the fact that these countries tend to be poorer in cultural knowledge and expressions than their less developed counterparts.[131] Similarly, at the intersection of intellectual property and data protection, those countries advocating strong protection and enforcement of intellectual property rights embrace standards supporting the free flow of data.[132] Meanwhile, those resisting demands for intellectual property reforms call for standards permitting the introduction of data localization measures[133] to protect what they perceive as the "new oil" in today's economy.[134] Because both sets of issues are part of a larger field or related to each other, the resulting policy incoherence in these areas can have serious ramifications for not only intellectual property rights holders but also society at both the domestic and international levels.

III. TECHNO-SPATIAL TRANSFORMATION

Since its inception in the 1880s, the international intellectual property regime has experienced many technological changes. If one looks at the early revisions of the Berne Convention, one cannot help but notice the important roles technologies have played in the development of new international standards.[135] For instance, the 1908 Berlin Act was introduced to update the Convention in light of photographic and cinematographic technologies.[136] The 1928 Rome Act included new

131 *See* Peter K. Yu, *Intellectual Property and the Information Ecosystem*, 2005 MICH. ST. L. REV. 1, 8 ("[A]s far as traditional knowledge is concerned, th[e] group [of low-protectionists who favors limited protection of intellectual property] often finds itself on the side of high-protectionists, along with Big Pharma and multinational agrochemical conglomerates.").

132 *See* Yu, *TRIPS and Its Contents*, *supra* note 36, at 221–22 ("[T]hose policymakers and commentators who are eager to support the development of strong intellectual property industries have argued for greater protection and enforcement as well as the affirmation of the territoriality principle . . . . Yet, in the electronic commerce or digital trade area, these policymakers and commentators increasingly find themselves arguing for the free flow of information and deterritorialization.").

133 For discussions of data localization measures, see generally W. KUAN HON, DATA LOCALIZATION LAWS AND POLICY: THE EU DATA PROTECTION INTERNATIONAL TRANSFERS RESTRICTION THROUGH A CLOUD COMPUTING LENS (2017); Anupam Chander & Uyên P. Lê, *Data Nationalism*, 64 EMORY L.J. 677 (2015).

134 *See* Peter K. Yu, *Data Producer's Right and the Protection of Machine-Generated Data*, 93 TUL. L. REV. 859, 860 n.1 (2019) (collecting sources that discuss data as the "new oil" in today's economy).

135 *See* Peter K. Yu, *Marshalling Copyright Knowledge to Understand Four Decades of Berne*, 12 IP THEORY 59, 69–76 (2022) [hereinafter Yu, *Marshalling Copyright Knowledge*] (discussing how the Berne Convention "has evolved to keep pace with new technology").

136 *See* Berne Convention for the Protection of Literary and Artistic Works art. 3, Sept. 9, 1886, 1 L.N.T.S. 217 (revised at Berlin Nov. 13, 1908) (stating expressly that the Convention "shall apply to photographic works and to works produced by a process analogous to photography"); *id.* art. 14 (extending protection to "the exclusive right of authorizing the reproduction and public representation of their works by cinematography").

provisions covering the broadcasting of copyrighted works.[137] And the 1948 Brussels Act extended the coverage to situations involving "television broadcasts, retransmissions, public communication of transmissions by such means as loudspeakers, and the fixation of works after transmission."[138]

Compared with their role in shaping copyright law, new technologies have had even more obvious impacts on patent law. Although the patent system provides incentives to stimulate the development of new technologies,[139] the emergence of these technologies has raised novel questions about the appropriate standards for intellectual property protection. In the TRIPS context, there is no better example than biotechnology. Even though this then-new technology was at an early stage when the TRIPS negotiations were launched,[140] and therefore had received only limited attention from the negotiators,[141] the issue has become increasingly important in later negotiations of international intellectual property agreements or international trade agreements containing intellectual property chapters. A case in point is the major controversy concerning protections for undisclosed test or other data for biological products[142] toward the end of the Trans-Pacific Partnership negotiations.[143] To avoid a similar impasse, such protection was not

137 *See* Berne Convention for the Protection of Literary and Artistic Works art. 11*bis*(1), Sept. 9, 1886, 123 L.N.T.S. 233 (revised at Rome June 2, 1928) ("Authors of literary and artistic works shall enjoy the exclusive right of authorizing the communication of their works to the public by radio-diffusion.").

138 RICKETSON & GINSBURG, *supra* note 4, at 117; *see also* Berne Convention for the Protection of Literary and Artistic Works art. 11*bis*(1)(i), Sept. 9, 1886, 331 U.N.T.S. 217, 231 (revised at Brussels June 26, 1948) (mentioning the "wireless diffusion of signs, sounds or images").

139 *See* WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF INTELLECTUAL PROPERTY LAW 294–310 (2003) (discussing the economic logic of patent law).

140 *See* Antonio Gustavo Trombetta, *Negotiating for Argentina*, *in* MAKING OF THE TRIPS AGREEMENT, *supra* note 30, at 257, 260 (noting that "[b]iotechnology was a relatively new field and international experience was scarce").

141 *See* Yu, *TRIPS and Its Contents*, *supra* note 36, at 168 ("Although the biotechnology revolution has been proceeding very rapidly since the 1980s, thanks in part to the United States Supreme Court decision of *Diamond v. Chakrabarty*, the Agreement includes only two sub-provisions addressing the policy and ethical concerns sparked by this revolution." (footnote omitted)); *see also* J.H. Reichman, *From Free Riders to Fair Followers: Global Competition Under the TRIPS Agreement*, 29 N.Y.U. J. INT'L L. & POL. 11, 36–37 (1996) (stating that it is "unlikely that states could use the WTO framework to oblige other states to adopt high levels of patent protection for [biotechnological] inventions for the foreseeable future").

142 *See* Frederick M. Abbott, *The Evolution of Public Health Provisions in Preferential Trade and Investment Agreements of the United States*, *in* CURRENT ALLIANCES IN INTERNATIONAL INTELLECTUAL PROPERTY LAWMAKING: THE EMERGENCE AND IMPACT OF MEGA-REGIONALS 45, 55 (Pedro Roffe & Xavier Seuba eds., 2017) (noting that "negotiation of the duration of the biologics exclusivity period was perhaps the most controversial part of the TPP negotiations"); Burcu Kilic & Courtney Pine, *Inside Views: Decision Time on Biologics Exclusivity: Eight Years Is No Compromise*, INTELL. PROP. WATCH (July 27, 2015), https://www.ip-watch.org/2015/07/27/decision-time-on-biologics-exclusivity-eight-years-is-no-compromise/ [https://perma.cc/4C6Q-N5QJ] ("As the Trans-Pacific Partnership . . . negotiations approach their endgame, biologics exclusivity is still considered 'one of the most difficult outstanding issues in the negotiation.'").

143 Trans-Pacific Partnership Agreement, Feb. 4, 2016, https://ustr.gov/trade-agreements/free-trade-agreements/trans-pacific-partnership/tpp-full-text [https://perma.cc/7NNT-LSUW]; *see also*

explored much in the negotiations on the Regional Comprehensive Economic Partnership Agreement and was completely left out of the agreement's final text.[144]

Despite the many impacts that the proliferation of new technologies has on the international intellectual property regime, the megatrend this Part seeks to highlight is not simply about such proliferation. Rather, it is about the spatial transformation brought about by these technologies—or what this Article will refer to as "techno-spatial transformation." For instance, the mainstreaming of the internet and the arrival of new communications technologies have called into question the appropriateness of existing intellectual property standards.[145] Not only does digital technology "greatly reduc[e] the cost and speed of reproduction while substantially increasing the quality of the reproduced work,"[146] such technology, along with the internet and later social media, has broken many traditional access barriers, including those relating to geography and language.[147] Given the potential for major transformation, it is no surprise that the WIPO membership eagerly negotiated the WIPO Copyright Treaty[148] and the WIPO Performances and Phonograms Treaty[149] only two years after the adoption of the TRIPS Agreement.[150]

More recently, the emergence of cloud computing has raised questions yet again about the appropriate intellectual property standards,

Peter K. Yu, *TPP and Trans-Pacific Perplexities*, 37 FORDHAM INT'L L.J. 1129 (2014) (criticizing the Trans-Pacific Partnership negotiations). Following the United States' withdrawal, the TPP Agreement evolved into the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Comprehensive and Progressive Agreement for Trans-Pacific Partnership, Mar. 8, 2018, https://www.mfat.govt.nz/en/trade/free-trade-agreements/free-trade-agreements-concluded-but-not-in-force/cptpp/comprehensive-and-progressive-agreement-for-trans-pacific-partnership-text [https://perma.cc/LYX9-CMJ6].

144 Regional Comprehensive Economic Partnership Agreement, Nov. 15, 2020, https://rcepsec.org/legal-text/ [https://perma.cc/B9W7-EJCT].

145 *See generally* COMM. ON INTELL. PROP. RTS. & THE EMERGING INFO. INFRASTRUCTURE, NAT'L RSCH. COUNCIL, THE DIGITAL DILEMMA: INTELLECTUAL PROPERTY IN THE INFORMATION AGE (2000) (discussing the threat digital technology has posed to the copyright system).

146 Peter K. Yu, *The Copyright Divide*, 25 CARDOZO L. REV. 331, 375 (2003); *see also* Raymond Shih Ray Ku, *The Creative Destruction of Copyright: Napster and the New Economics of Digital Technology*, 69 U. CHI. L. REV. 263, 264 (2002) (noting that "digital technology makes it possible to make an unlimited number of perfect copies of music, books, or videos in digital form, and through the Internet individuals may distribute those digital works around the world at the speed of light"); Eugene Volokh, *Cheap Speech and What It Will Do*, 104 YALE L.J. 1805, 1808–33 (1995) (arguing that the internet has greatly reduced the production and reproduction costs of information).

147 *See generally* Peter K. Yu, *A Seamless Global Digital Marketplace of Media and Entertainment Content*, *in* RESEARCH HANDBOOK ON INTELLECTUAL PROPERTY IN MEDIA AND ENTERTAINMENT 265, 266–76 (Megan Richardson & Sam Ricketson eds., 2017) [hereinafter Yu, *Seamless Digital Marketplace*] (noting that the internet and new communications technologies have broken six types of access barrier in the digital environment—namely, geographical, temporal, economic, linguistic, legal, and technological).

148 WIPO Copyright Treaty, Dec. 20, 1996, 2186 U.N.T.S. 121.

149 WIPO Performances and Phonograms Treaty, Dec. 20, 1996, 2186 U.N.T.S. 203.

150 *See* Yu, *Currents and Crosscurrents*, *supra* note 5, at 369–74 (discussing the 1996 WIPO diplomatic conference that led to the establishment of these two international intellectual property agreements).

due in large part to the need for "replicat[ion of content] . . . for reasons of performance, availability, backup, and redundancy."[151] Because cloud platforms tend to involve remote servers located abroad, distribution of copyrighted works on these platforms has raised additional territoriality-related questions concerning applicable laws and their extraterritorial application.[152]

In the past decade, the emergence of streaming technology and the need for travelers to have access to lawfully purchased copyrighted content have raised interesting questions that have not been explored in the first few decades of the international intellectual property regime. People are now more mobile, and technology has provided them with easy global access to digital copyrighted content. To tackle these questions, former WIPO Director General Francis Gurry, in his welcoming address to the 2013 WIPO Assemblies, called for the launch of a global multi-stakeholder dialogue to help develop "a seamless global digital marketplace" of copyrighted content.[153] As he observed in a follow-up interview with *Intellectual Property Watch* a few months later:

> I do not think this is a legislative exercise. This is something that involves a little bit of legislation, for example, the Bruce Willis problem, which is that he has 50,000 songs that he has bought on iTunes, can he give them to his children? If it were 50,000 CDs, he could. So there are some legislative tweaks. But it is mainly about better business models, which is for the private sector to do. It is about improving the culture and understanding, it is about infrastructure, and data standards. That marketplace is a marketplace of data. Metadata constitute creative work and metadata have to talk to each other, so I would like to see us working on developing in a multi-stakeholder dialogue a loose roadmap of things that need to be done to achieve the efficient seamless legal global digital marketplace.[154]

Recognizing the need for multijurisdictional arrangements is important because copyright laws vary from country to country and region to region. In the past few decades, industries across the world have actively deployed technological tools to retrofit national borders, ranging

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151 Ian Walden, *Law Enforcement Access to Data in Clouds*, *in* CLOUD COMPUTING LAW 285, 287 (Christopher Millard ed., 1st ed. 2013).

152 *See* Peter K. Yu, *Towards the Seamless Global Distribution of Cloud Content*, *in* PRIVACY AND LEGAL ISSUES IN CLOUD COMPUTING 180, 186 (Anne S.Y. Cheung & Rolf H. Weber eds., 2015) [hereinafter Yu, *Cloud Content*] ("If the cloud platform involves remote servers located outside the country, such distribution will raise two additional sets of territoriality questions: (1) What is the applicable law? (2) Will such law be applied extraterritorially?").

153 Francis Gurry, Director General, WIPO, Address at the 2013 WIPO Assemblies (Sept. 23, 2013) (transcript available at http://www.wipo.int/about-wipo/en/dgo/speeches/a_51_dg_speech.html [https://perma.cc/ZG6P-CS8T]); *see also* Yu, *Seamless Digital Marketplace*, *supra* note 147, at 279–80 (discussing the development of a a global multi-stakeholder dialogue as a reform pathway).

154 Catherine Saez, *WIPO Director Gurry Speaks on Naming New Cabinet, Future of WIPO*, INTELL. PROP. WATCH (May 8, 2014), https://perma.cc/9T92-PY5H.

from the use of technological protection measures[155] to the introduction of geoblocking technologies.[156] In response, individual users have resorted to geocircumvention tools, which have sparked lawsuits, new anti-circumvention legislation, and the introduction of new business models and licensing practices.[157]

Techno-spatial transformation is important to the future development of the international intellectual property regime in four ways. First, such transformation directly targets territoriality, the bedrock principle of intellectual property law.[158] Closely relating to this principle is the independence-of-right doctrine recognized in both the Paris and Berne Conventions.[159] Under the existing international intellectual property regime, there is no world copyright or patent. Instead, authors and inventors secure protections in Australia, Brazil, and China.[160] Whether those protections extend extraterritorially is at the discretion of each jurisdiction.[161] While the national treatment provisions in the Paris and Berne Conventions and the TRIPS Agreement prevent countries from discriminating against foreign authors and inventors,[162] countries retain sovereign power to determine the protections for their own nationals.[163]

155 For discussions of the use of region codes to protect copyrighted content in DVDs, see generally Rostam J. Neuwirth, *The Fragmentation of the Global Market: The Case of Digital Versatile Discs (DVDs)*, 27 CARDOZO ARTS & ENT. L.J. 409 (2009); Peter K. Yu, *Region Codes and the Territorial Mess*, 30 CARDOZO ARTS & ENT. L.J. 187 (2012) [hereinafter Yu, *Region Codes*].

156 *See* Peter K. Yu, *A Hater's Guide to Geoblocking*, 25 B.U. J. SCI. & TECH. L. 503, 506–12 (2019) [hereinafter Yu, *Geoblocking*] (criticizing the use of geoblocking tools).

157 *See id.* at 519–22 (discussing the need for geocircumvention exceptions). For discussions of geocircumvention, see generally Tal Kra-Oz, *Geoblocking and the Legality of Circumvention*, 57 IDEA 385 (2017); Michelle Edelman, Note, *The Thrill of Anticipation: Why the Circumvention of Geoblocks Should Be Illegal*, 15 VA. SPORTS & ENT. L.J. 110, 126–28 (2015).

158 *See* Berne Convention, *supra* note 2, art. 5(3) ("Protection in the country of origin is governed by domestic law."); Paris Convention, *supra* note 1, art. 4*bis*(1) ("Patents applied for . . . by nationals of a country of the Union shall be independent of patents obtained for the same invention in other countries"); Yu, *Geoblocking*, *supra* note 156, at 516 ("For many, territoriality remains the bedrock principle of the copyright system."); Peter K. Yu, *A Spatial Critique of Intellectual Property Law and Policy*, 74 WASH. & LEE L. REV. 2045, 2064 (2017) [hereinafter Yu, *Spatial Critique*] ("Territoriality is the bedrock principle of the intellectual property system, whether the protection concerns copyrights, patents, trademarks, or other forms of intellectual property rights.").

159 *See* Yu, *Cloud Content*, *supra* note 152, at 184–85 (discussing the independence-of-right doctrine); Frederick M. Abbott, *Seizure of Generic Pharmaceuticals in Transit Based on Allegations of Patent Infringement: A Threat to International Trade, Development and Public Welfare*, 1 WIPO J. 43, 44 (2009) (distinguishing between the territoriality and independence of intellectual property rights).

160 *See* Yu, *Region Codes*, *supra* note 155, at 188 ("Copyright holders cannot yet obtain unitary protection throughout the world. Instead, they obtain rights in Australia, Brazil, China, France, South Africa, and the United States.").

161 *See* Yu, *Spatial Critique*, *supra* note 158, at 2119–22 (discussing the extraterritorial application of intellectual property laws).

162 *See* Berne Convention, *supra* note 2, art. 5(1) (providing for national treatment); Paris Convention, *supra* note 1, art. 2(1) (providing for national treatment); TRIPS Agreement, *supra* note 26, art. 3 (providing for national treatment).

163 *See* Berne Convention, *supra* note 2, art. 5(1) ("Protection in the country of origin is governed by domestic law.").

Second, techno-spatial transformation has raised new and interesting choice-of-law questions. A case in point is the emergence of satellite communications following the adoption of the 1971 Paris Act of the Berne Convention. Such emergence has sparked debates on when an act of communication to the public through a satellite has taken place and how choice-of-law questions involving such communication are to be resolved.[164] In September 1993, the European Union adopted the Satellite and Cable Directive, which included a provision to help address these questions.[165] Article 1.2(d) stipulates how infringing activities conducted via satellite communication are to be localized by reference to the sites of the uplink station and the broadcasting organization.[166] Such choice-of-law analysis, in turn, has paved the way for later analyses in the context of cyberspace[167] and cloud computing.[168]

Third, techno-spatial transformation affects the equitable distribution of benefits the international intellectual property regime provides at the international, regional, and national levels. The North-South debate captures well the discussion on the widening gap between developed and developing countries.[169] Even after taking into account the rise of emerging countries explored in Part I,[170] that discussion tends to rely heavily on cross-country comparisons. What is less observed, however, is the equally growing divide between the rich and the poor within each individual country—whether developed, emerging, or developing.[171] For instance, WIPO has highlighted the development of innovation clusters in many developing countries, virtually all of which

164 As Paul Geller observed:

> One medium has stretched this elastic territoriality to the breaking point: the satellite broadcast of works. In particular, there has been debate on the questions: Which country's law applies to determine whether, and where, such broadcasts might be infringing? Should the law of each country in a satellite-broadcast footprint apply as a work is relayed by the satellite into each country? Or should the law of the country of the uplink broadcast to the satellite apply throughout the footprint?

Paul Edward Geller, *New Dynamics in International Copyright*, 16 COLUM.-VLA J.L. & ARTS 461, 467 (1992).

165 Council Directive 93/83/EEC, 1993 O.J. (L 248) 15.

166 *Id.* art. 1.2(d).

167 *See* Paul Edward Geller, *Conflicts of Laws in Cyberspace: Rethinking International Copyright*, 44 J. COPYRIGHT SOC'Y U.S.A. 103, 104 (1996) ("[I]n digitally generated networks, transmitters and receivers can interact and change roles instantaneously across thousands of miles in cyberspace. This type of case accordingly requires a new analysis of choice-of-law options [different from the one involving satellite broadcasting].").

168 *See* Yu, *Cloud Content*, *supra* note 152, at 204–06 (discussing choice-of-law questions in the cloud computing context).

169 *See supra* text accompanying notes 30–35.

170 *See* discussion *supra* Part I.

171 *See* Peter K. Yu, *Intellectual Property, Global Inequality and Subnational Policy Variations*, *in* INTELLECTUAL PROPERTY, INNOVATION AND GLOBAL INEQUALITY (Daniel Benoliel, Francis Gurry, Keun Lee & Peter K. Yu eds., forthcoming 2023) [hereinafter Yu, *Global Inequality*] (noting the need to understand inequalities within countries in the intellectual property context).

are distributed unevenly throughout each individual country.[172] In prior work, I have also offered solutions to address the significant disparities between intellectual property and innovative activities within these countries.[173]

Finally, techno-spatial transformation could exacerbate in the future and bring new scenarios and questions that intellectual property policymakers and commentators have not yet explored. Consider, for example, intellectual property protection in "The Next 100 Years of International Law"—the theme selected for the centennial meeting of the American Branch of the International Law Association, which this collection of articles commemorates. Going forward, it will be important to explore the protection of intellectual property rights in outer space. Such exploration remains rare even though international space treaties have existed for more than half a century.[174] Few commentators have examined how these instruments are to be applied in the intellectual property context, or whether they need updates or revisions.[175]

A good illustration is what some engineers and technology researchers have called "4D printing."[176] Technology already exists to allow water, heat, or light to transform products. Due to very different environmental conditions that involve some or all of these factors, the designs in outer space are likely to be quite different from those on Earth even if the designs originate from the same right holders. It will therefore not be far-fetched to assume that activities conducted in outer space will raise many unexplored questions in the intellectual property field. To some extent, the urgency to grapple with these questions resembles the ongoing effort[177] on the part of policymakers and commentators to

172 *See* WORLD INTELL. PROP. ORG., GLOBAL INNOVATION INDEX 2021: TRACKING INNOVATION THROUGH THE COVID-19 CRISIS 203 (Soumitra Dutta, Bruno Lanvin, Lorena Rivera León & Sacha Wunsch-Vincent eds., 2021) (providing a top 100 ranking of the world's science and technology clusters).

173 *See* Yu, *Global Inequality*, *supra* note 171; Yu, *Spatial Critique*, *supra* note 158, at 2091–100, 2123–27.

174 *See, e.g.*, G.A. Res. 34/68, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Dec. 5, 1979); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119; Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187; Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15; Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.T 2410, 610 U.N.T.S. 205.

175 Some rare book-length treatments include TOSAPORN LEEPUENGTHAM, THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS IN OUTER SPACE ACTIVITIES (2017); RESEARCH AND INVENTION IN OUTER SPACE: LIABILITY AND INTELLECTUAL PROPERTY RIGHTS (Sa'id Mosteshar ed., 1995).

176 *See, e.g.*, *4D Printing*, SELF-ASSEMBLY LAB'Y, https://selfassemblylab.mit.edu/4d-printing [https://perma.cc/3KZH-WNSN] (providing an overview of a technology that allows the use of water, heat, light, or other simple energy input to facilitate the adaptation of 3D-printed structures and systems).

177 *See* Yu, *Marshalling Copyright Knowledge*, *supra* note 135, at 72–75 (discussing the effort by

address authorship and inventorship involving artificial intelligence.[178] The better we understand how intellectual property law interacts with these new technologies, the more prepared we will be when they enter the mainstream.

CONCLUSION

The international intellectual property regime has experienced significant transformation since its emergence more than a century ago. To illuminate the magnitude and ramifications of this transformation, this Article has identified three megatrends: (1) the rise of emerging countries; (2) the increased complexity of the international intellectual property regime; and (3) spatial transformation brought about by the proliferation of new technologies. Because each megatrend remains active and continues to affect this regime, it will be important not only to take stock of these trends and their ramifications but also to follow the many developments sparked by these trends. As this Article has shown, these three megatrends have played important roles in shaping the development of the international intellectual property regime. They will continue to do so in decades to come.

WIPO and national governments to explore the impact of artificial intelligence on intellectual property law and policy).

[178] *See* Peter K. Yu, *Can Algorithms Promote Fair Use?*, 14 FIU L. REV. 329, 330 n.2 (2020) (collecting the literature that discusses whether creative works generated by intelligent machines are eligible for copyright protection).