July 2019

Blunting the Later-Mover Advantage: Intellectual Property and Knowledge Transfer

Irina D. Manta

Mattias G. Ottervik

BLUNTING THE LATER-MOVER ADVANTAGE: INTELLECTUAL PROPERTY AND KNOWLEDGE TRANSFER

*Irina D. Manta**

*Mattias G. Ottervik***

ABSTRACT

The United States followed a path of initially giving little protection to intellectual property (IP) so that the country could benefit from the IP of nations we term earlier-movers on the world stage of economic development. This symposium piece argues that Japan and China have been following a similar trajectory in their intellectual property laws while progressing on their own economic climb. Widespread

* Associate Dean for Research and Faculty Development, Professor of Law, and Founding Director of the Center for Intellectual Property Law, Maurice A. Deane School of Law at Hofstra University; Yale Law School, J.D.; Yale University, B.A.

** Assistant Professor, School of Political Science and Public Administration, Shandong University; The Chinese University of Hong Kong, Ph.D.; University of Gothenburg, M.Sc.; Yale University, B.A. We would like to thank the participants of the 2018 Annual Akron Law IP Scholars Forum, of the 2019 Tri-State Region Intellectual Property Workshop at the New York University School of Law, and of the First Hofstra Scholars Roundtable. We are also grateful to the Maurice A. Deane School of Law and the Waseda University School of Law for institutional support.

international outsourcing of manufacturing has made intellectual property a key asset for private companies, which has strengthened the tendencies of earlier-movers to formulate and enforce strict intellectual property laws. This suggests that countries like China respond not only to pressure from earlier-movers like the United States to increase intellectual property protection, but are also driven by concerns against their own later-movers. Perhaps curiously, if the hierarchy of movers shifts and the relative interest in intellectual property enforcement does as well, China will someday seek to protect its goods against infringement by the likes of the United States and Japan.

I. INTRODUCTION

> On World Intellectual Property Day, we not only celebrate invention and innovation, but also we recognize how integral intellectual property rights are to our Nation's economic competitiveness. Intellectual property rights support the arts, sciences, and technology. They also create the framework for a competitive market that leads to higher wages and more jobs for everyone. The United States is committed to protecting the intellectual property rights of our companies and ensuring a level playing field in the world economy for our Nation's creators, inventors, and entrepreneurs.[1]

Intellectual property is commonly argued to be a source of economic competitiveness, and its protection is critically important to those countries that perceive themselves as having an economic and technological edge. Indeed, intellectual property protection allows earlier-movers (those who through previous scientific or technological innovation have an edge over competitors) to maintain their advantage vis-à-vis later-movers (those who seek to catch up to and overtake earlier-movers). However, historically most scientific or technological innovations of import have—even in the face of penalty of death—been transferred to and critically improved upon by later-movers. Earlier-movers have a tendency to become overtaken by later-movers that learn from and improve upon the knowledge of earlier-movers. From the perspective of countries' economic competitiveness, the danger of knowledge transfer stems not from the prospect of unfair competition but, in the long run, from the possibility that the recipient might overtake the

1. The White House, Proclamation, *President Donald J. Trump Proclaims April 26, 2018, as World Intellectual Property Day*, WHITE HOUSE (Apr. 26, 2018), https://www.whitehouse.gov/presidential-actions/president-donald-j-trump-proclaims-april-26-2018-world-intellectual-property-day/ [https://perma.cc/VUX5-AMV2].

source by innovating on the knowledge transferred. Countries that have the earlier-mover advantage in some domain have a strong incentive to protect their intellectual property against later-movers at any one point in time. That said, to the extent that a country is concerned with maintaining a perceived economic or technical lead, intellectual property protection is only one element of a larger strategy that must emphasize intellectual property production. Intellectual property protection safeguards past innovation, but future innovation requires continuous intellectual property production that necessitates more than just a solid intellectual property legal framework.

Countries' views toward and willingness to enact as well as enforce intellectual property laws often track their level of not just absolute but also relative economic development, as illustrated by the examples of the United States, Japan, and recently, China. All three countries realized rapid economic growth by first building the human and physical infrastructure needed to sustain growth, and then, selectively, by hook or by crook, learning from other countries. As these countries began to overtake competitors economically and technically, their intellectual property protection laws became increasingly strict and severe. With economic growth, countries that previously acted as industrial spies and infringers of others' intellectual property seem to become stalwart defenders and maintainers of (their own) intellectual property rights.

The Trump Administration's full-court press against what it argues to be unfair competition from China—one prong of which is vociferous U.S. government complaints of intellectual property infringement—makes the question of what role intellectual property plays in economic competitiveness not only academically interesting but also highly salient. The basic argument by the Administration seems to be that American economic competitiveness vis-à-vis China can be maintained by strengthening intellectual property protection. This argument rests on the assumption that China is a copycat that on balance infringes more on others' intellectual property than it creates. The situation may be shifting, and the argument overlooks the decades-long investment-driven rise of China. Currently, and going forward, China might in fact be producing more intellectual property of certain types than the United States and protecting it through an increasingly robust legal system. This has far-reaching consequences both for the United States and China. To explore these consequences, this symposium piece analyzes the relationship between intellectual property and economic development over time in

general, as well as specifically in the cases of the United States, Japan, and China.[2]

Part II presents the idea of earlier-mover and later-mover advantages as applied to intellectual property and economic development. The earlier-mover advantage is the technological and economic competitive advantage that a company or country has vis-à-vis its competitors by virtue of relative temporal precedence. The compound nature of economic growth and the importance of earlier inventions for later ones mean that being earlier in seeing rapid, or even comparatively high, economic growth and technological development pays dividends over long periods of time. Being a later-mover provides its own set of advantages, not least of which is the possibility of leapfrogging the earlier-mover by skipping intermediate steps. We use the terms *earlier-mover* (rather than first- or early-mover) and *later-mover* (rather than second- or late-mover) because this piece describes countries' positions relative to each other, which can vary over time. The West in general, and the United States in particular, has for decades had the earlier-mover advantage. East Asia in general, and China in particular, has shown how the later-mover advantage can be exploited with the right policy package.

Part III analyzes three cases of economic development—those of the United States, Japan, and China—and its relationship with infringement, production, and protection of intellectual property. In the past decades, the first two countries have been earlier-movers with a clear economic and technological advantage over later-movers. However, all three countries have a history of being classified as later-movers: the United States vis-à-vis Great Britain and Europe; Japan vis-à-vis the United States and the West; and China vis-à-vis the United States, the West, and Japan. In the cases of the United States and Japan, flagrant initial intellectual property infringement along with a more (for Japan) or less (for the United States) purposeful investment in intellectual property production led to economic growth and increasingly stringent intellectual property protection. Aggressive and successful exploitation of the later-mover advantage over time led both the United States and Japan to equally assertively protect

2. Intellectual property covers a large swath of intangible property, and it is used here in the same sense as indicated in the March 22, 2018 Report of the United States Trade Representative on China. That is to say, it covers the legally protected know-how that undergirds a modern economy, i.e., "patents, copyrights, trademarks, trade secrets." OFFICE OF THE U.S. TRADE REPRESENTATIVE, *Findings of the Investigation Into China's Acts, Policies, and Practices Related to Technology Transfer, Intellectual Property, and Innovation under Section 301 of the Trade Act of 1974*, at 6 (March 22, 2018), https://ustr.gov/sites/default/files/Section%20301%20FINAL.PDF [https://perma.cc/N23A-KBLQ]. Relatedly, when not qualified, development in this symposium piece refers to social and economic development.

their—at times arguably ill-begotten—earlier-mover advantage as they out-grew and out-innovated those upon whose intellectual property they had initially infringed. China has so far followed closely in the footsteps of both the United States and especially Japan, allegedly infringing on the intellectual property of earlier-movers, significantly investing in domestic intellectual property production, and building a comprehensive framework for protecting intellectual property. A future where China expects the same protection of its intellectual property that former earlier-movers demanded from it might not be far off.

Part IV builds on the previous parts and presents the argument that while intellectual property protection is important, production (which depends heavily on many factors outside the legal framework) is equally if not more important. Intellectual property protection alone will not allow any country to maintain an edge vis-à-vis other countries. Historically, with the possible exception of Greek Fire, knowledge transfer has been inevitable even upon pain of death. What allowed some countries to gain and maintain economic competitiveness was their capacity to develop new science and technologies. If an emphasis on the protection of old intellectual property is not accompanied by policy initiatives to promote the production of innovative goods, such emphasis could prove to be highly disadvantageous. Furthermore, to the extent that intellectual property protections blunt the later-mover advantage, an ironclad global intellectual property regime is likely to make it harder for overtaken earlier-movers to catch up again once they become later-movers.

II. EARLIER- AND LATER-MOVER ADVANTAGE

While the idea of earlier-mover and later-mover advantages is well-established in the business world, the concept also holds in political economy. Being an earlier-mover pays dividends for a country over long periods of time because of the largely cumulative nature of scientific and technological progress, and the compound nature of economic growth. In fact, the best predictor of a country's future development level is its past development level.[3] However, history is replete with earlier-movers losing their edge to later-movers that first copy and then innovate.

Being a later-mover provides its own set of advantages, not least of which is the possibility of leapfrogging the earlier-mover by skipping

3. Mattias Ottervik, *Gender and Progress: How Gender Equality Affects Long-Term Human Development* 48–49, Ph.D. thesis, The Chinese University of Hong Kong, Department of Government and Public Administration, 2017 (on file with authors).

intermediate steps.[4] For example, it took almost four hundred years from the publication of William Gilberte's *De Magnete* in 1600, which introduced the word electricity, to the creation of the integrated circuit by Texas Instruments. The earlier-mover advantage of the West allowed for its development of integrated circuits. The later-mover advantage consists of the short-circuiting (no pun intended) of centuries of piecemeal scientific progress. Non-Western integrated circuit designers and manufacturers do not have to start by working themselves up from the first principles of electricity; rather, these actors skip all intermediate steps.

History is replete with examples of later-movers scientifically and economically overtaking earlier-movers. Almost all technical and scientific developments of note and import have invariably been spread. For most of history, knowledge transfer has been an immutable force.[5] The question then is not how to prevent it, but what is to be done given its inevitability. Because of the cumulative nature of scientific and technological development, the key question is how will each innovation be made the basis for the next, and who will the next innovator be? Movable type printing was critical for the progress and dissemination of science during the Western Renaissance and Enlightenment,[6] but foundational to that was the comparatively cheap and sturdy paper invented in China.[7] It is doubtful that movable type printing would have had the impact it did if Gutenberg had been forced to print on papyrus or parchment. Some of this diffusion of knowledge happened naturally (such as Indian numerals being adopted throughout the Middle East before making it to Europe), but most happened through more sordid means. For example, paper-making likely arrived in Europe by way of the Abbasid Caliphate's capture of Chinese paper-makers at the Battle of Talas.

While the Industrial Revolution was a period of rapid technical, economic, and scientific development across the West, its national foundation was laid not seldom through industrial espionage and

4. *See generally* ALEXANDER GERSCHENKRON, ECONOMIC BACKWARDNESS IN HISTORICAL PERSPECTIVE: A BOOK OF ESSAYS (1962).

5. George Basalla, *The Spread of Western Science*, 156 SCIENCE 611 (1967); Steven J. Harris, *Networks of Travel, Correspondence, and Exchange*, *in* 3 CAMBRIDGE HIST. SCI. 341, 341 (Katharine Park & Lorraine Daston eds., 2006).

6. *See* ELIZABETH L. EISENSTEIN, THE PRINTING REVOLUTION IN EARLY MODERN EUROPE 46–101, 164–208 (1983).

7. Susan O. Thompson, *Paper Manufacturing and Early Books*, 314 ANNALS N.Y. ACADEMY SCI. 167, 167 (1978).

intellectual property infringement.[8] British entrepreneurs illegally copied Italian designs for mechanized silk-spinning, and then improved upon and used them to spin cotton, which had a significantly larger market.[9] Later-mover United States, in turn, encouraged the illicit, and according to British law, illegal transfer of knowledge to the United States. Entrepreneurs in the United States improved upon that knowledge, and its government over time became as forceful a proponent of protection of proprietary knowledge as had been Italy's and Great Britain's. Christoph Roser, describing the round-robin industrial espionage behind the creation of modern manufacturing across the West, summarizes it in the following way:

> It is easy to see analogies. Italian and British industrialists back then were probably as upset about the theft of intellectual property as modern industrialists are about technology theft. Similarly, modern China, on the receiving end of many modern-day transfers, is probably as snug as a bug about this gain as the United States or Germany was back then. In all cases, countermeasures were, at best, only able to slow down the knowledge transfers.[10]

Proprietary knowledge was illicitly transferred between competitor nations throughout the Industrial Revolution like it had been in ages past.

8. CHRISTOPH ROSER, "FASTER, BETTER, CHEAPER" IN THE HISTORY OF MANUFACTURING: FROM THE STONE AGE TO LEAN MANUFACTURING AND BEYOND 110 (2017).

9. *Id.* at 104–10.

10. *Id.* at 110.

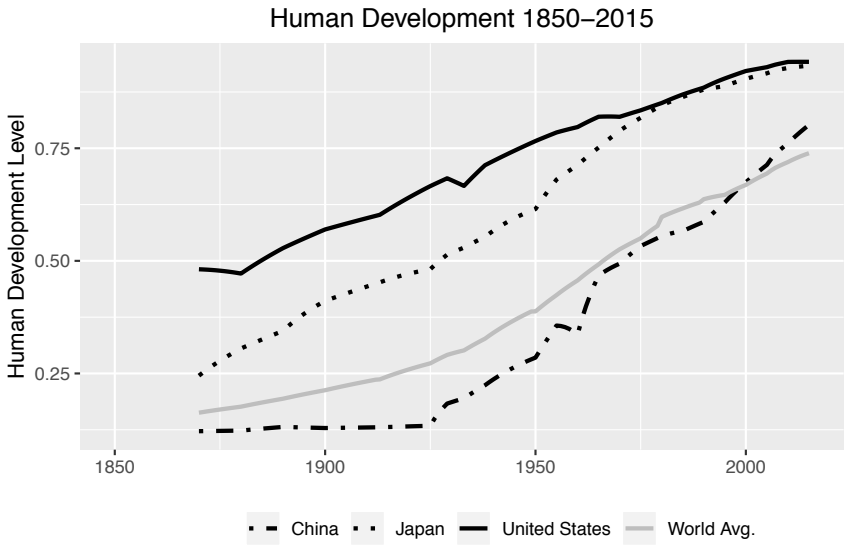

Figure 1. Human Development 1850–2010

In modern times both Japan and China were quintessential later-movers. When American gun-boats forcibly opened Japan, this set off a civil war whose victors formed the Meiji government and concluded that Japan was, in terms of wealth and power, about 40 years behind the West. The new Japanese government initiated a global fact-finding mission, the Iwakura Mission, which visited the most developed countries in the world to search for clues to their economic and military power. The lessons learned were immediately turned into social and economic policy. Judicious application of what it had learned from earlier-movers transformed Japan into an industrial power over the course of a generation. Similarly, at the founding of the People's Republic, China was one of the poorest and least developed countries in the world, and as its government set about improving quality of life for its citizens, it had its work cut out for it. However, China benefited from foreign examples to enhance its learning, and learn it did. Like their Japanese counterparts before them, Chinese intellectuals and the Chinese government scoured the world for the sort of practical knowledge that would allow China to realize rapid development. One way to quantify just how far behind Japan and China were at various points in time with regard to other countries is to compare their level of human development—a United Nations-created

composite measure of education, health, and material welfare.[11] As shown in Figure 1,[12] in terms of human development both Japan and China were able to realize rapid improvements: in the case of Japan allowing it to catch up to earlier-mover United States, and in the case of China going from being one of the least developed to one of the more developed countries in the world.

III. INTELLECTUAL PROPERTY AND DEVELOPMENT

By making some knowledge proprietary, legal protection, at least in theory, offers an effective mechanism of blunting the later-mover advantage in the short term. In the case of the United States, it allowed companies to transfer manufacturing know-how to developing countries like China while still retaining a sense of ownership. Production could be outsourced because there was, in theory at least, little fear that manufacturers would turn around and wholesale infringe on the intellectual property rights of their customers. The lack of fear was justified for two reasons. First, most Western consumer brands sourced manufacturing or design expertise from other companies, an arrangement that would not have been possible without intellectual property protection. Second, and perhaps more importantly, as long as the outsourcing companies had an innovation pipeline (not seldom fed by past public investments), manufacturing was not a key part of the value chain. In the case of the U.S., it had ARPANET, the progenitor of the modern internet,[13] and the space program, which led to the development of integrated circuits. These public investments—especially when paired with world-class universities attracting students from all over the world who often stayed in the U.S—paid dividends decades after they were made and led to the creation of companies like Apple, Microsoft, and Dell, and to the 1990s economic boom in the United States.[14] It took Japan 30

11. UNITED NATIONS DEVELOPMENT PROGRAMME, HUMAN DEVELOPMENT REPORT 1990, 9–16 (1990), http://hdr.undp.org/sites/default/files/reports/219/hdr_1990_en_complete_nostats.pdf [https://perma.cc/2CXD-SXZ4].

12. Leandro Prados de la Escosura, *World Human Development: 1870-2007*, 61 REV. INCOME & WEALTH 220, 230, 234 (2015) (presenting data for Figure 1 from HIHD columns in Table 1 and Table 2); Ottervik, *supra* note 3, at 105–07.

13. ARPANET was funded by the Advanced Research Projects Agency of the United States Department of Defense. WALTER ISAACSON, THE INNOVATORS: HOW A GROUP OF HACKERS, GENIUSES, AND GEEKS CREATED THE DIGITAL REVOLUTION 235–37 (2014).

14. Paul Ceruzzi, *Apollo Guidance Computer and the First Silicon Chips*, SMITHSONIAN AIR & SPACE MUSEUM https://airandspace.si.edu/stories/editorial/apollo-guidance-computer-and-first-silicon-chips [https://perma.cc/PAC4-L6VV]; *see generally* Timothy Sturgeon, *How Silicon Valley Came to Be*, *in* UNDERSTANDING SILICON VALLEY: THE ANATOMY OF AN ENTREPRENEURIAL

years to grant a patent on the integrated circuit,[15] which allowed for infringement of American intellectual property in the meantime. Nevertheless, the innovation pipeline in the United States in general and Silicon Valley in particular enabled American companies to dominate the first decades of the computer revolution.[16] The United States, while the cradle of this revolution, may be losing its edge in that area, though.

There appears to be a significant change in the relative innovativeness of the United States and China. The latter has frequently globally been viewed as the most significant intellectual property thief that reaps where it has not sown.[17] China has long been seen as both a mass manufacturer and significant consumer of goods that infringes upon every area of intellectual property law, be it patents, copyright, trademarks, or trade secrets. In recent years, however, China has taken measures such as to reduce problems previously associated with "local judicial protectionism: challenges in obtaining evidence[;] small damage awards[;] and a perceived bias against foreign firms."[18] In significant part, this change is being driven by both a maturation of the Chinese judicial system and the fact that China is now, like the United States and Japan before it, producing too much valuable intellectual property not to protect it.

REGION 15–47 (Martin Kenney ed., 2000); PAUL FREIBERGER & MICHAEL SWAINE, FIRE IN THE VALLEY: THE MAKING OF THE PERSONAL COMPUTER (2000).

15. John C. Lindgren & Craig J. Yudell, *Protecting American Intellectual Property in Japan*, 10 SANTA CLARA COMPUTER & HIGH TECH. L.J. 1, 7–9 (1994).

16. Tracey Samuelson, *How the U.S. Outgrew 1980s Trade Anxiety Over Japan*, MARKETPLACE para. 19 (Nov. 29, 2018), https://www.marketplace.org/2018/11/29/economy/how-us-outgrew-1980s-anxiety-over-japan [https://perma.cc/Y3WU-NLG6].

17. Peter K. Yu, *The Rise and Decline of the Intellectual Property Powers*, 34 CAMPBELL L. REV. 525, 549 (2012) [hereinafter Yu, *Rise and Decline*]; Peter Yu, *Intellectual Property, Economic Development, and the China Puzzle*, *in* INTELLECTUAL PROPERTY, TRADE AND DEVELOPMENT: STRATEGIES TO OPTIMIZE ECONOMIC DEVELOPMENT IN A TRIPS-PLUS ERA 173 (Daniel J. Gervais ed., 2007) [hereinafter Yu, *China Puzzle*]. *See generally* Peter K. Yu, *From Pirates to Partners: Protecting Intellectual Property in China in the Twenty-First Century*, 50 AM. U. L. REV. 131 (2000); Peter K. Yu, *From Pirates to Partners (Episode II): Protecting Intellectual Property in Post-WTO China*, 55 AM. U. L. REV. 901 (2006).

18. *See* William Weightman, *China's Progress on Intellectual Property Rights (Yes, Really)*, DIPLOMAT (Jan. 20, 2018), para. 4 https://thediplomat.com/2018/01/chinas-progress-on-intellectual-property-rights-yes-really/ [https://perma.cc/RW2G-2286].

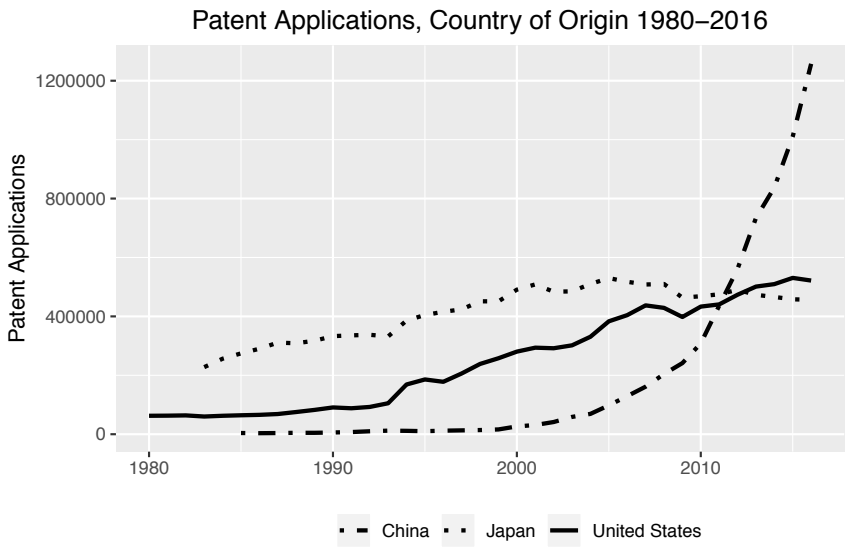

Figure 2. Patent Applications by Country of Origin 1980-2016

As shown in Figure 2, in 2016, Chinese entities applied for as many patents as Japan and the United States combined.[19] There is some reason to question the quality of Chinese patent applications,[20] and the number of applications might be inflated by patent subsidy programs.[21] That being said, while the overall number of patents may be inflated, the growth does reflect an increase in innovation.[22] Supporting the idea that patent filings are showing an underlying change in innovation is that China is making rapid headway in broader measures of innovativeness such as the Global

19. WIPO IP Statistics Data Center, WIPO, https://www3.wipo.int/ipstats/ (last visited May 26, 2019) (WIPO statistics database tool used to pull data for Figure 2).

20. Lulu Yilun Chen, *China Claims More Patents Than Any Country—Most Are Worthless*, BLOOMBERG para. 3 (Sept. 28, 2018), https://www.bloomberg.com/news/articles/2018-09-26/china-claims-more-patents-than-any-country-most-are-worthless [https://perma.cc/PP2F-SMVU].

21. Jianwei Dang & Kazuyuki Motohashi, *Patent Statistics: A Good Indicator for Innovation in China? Patent Subsidy Program Impacts on Patent Quality*, 35 CHINA ECON. REV. 137, 137 (2015).

22. Dan Prud'homme, *Chinese Patent Quantity and Patent Quality, and the Role of the State*, *in* DAN PRUD'HOMME & TAOLUE ZHANG, EVALUATION OF CHINA'S INTELLECTUAL PROPERTY REGIME FOR INNOVATION, REPORT FOR THE WORLD BANK 65 (2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3104260 [https://perma.cc/GU69-QTPG].

Innovation Index shown in Figure 3.[23] This is important for two reasons. First, foreign policy-makers have to drastically change their views of the world. For example, when Apple adjusted its earning guidance—largely based on poor sales in China—Larry Kudlow suggested that intellectual property infringement by Chinese phone manufacturers could explain the drop in sales.[24] However, the thought of China as a source of only cheap, low-quality knock-offs is outdated.

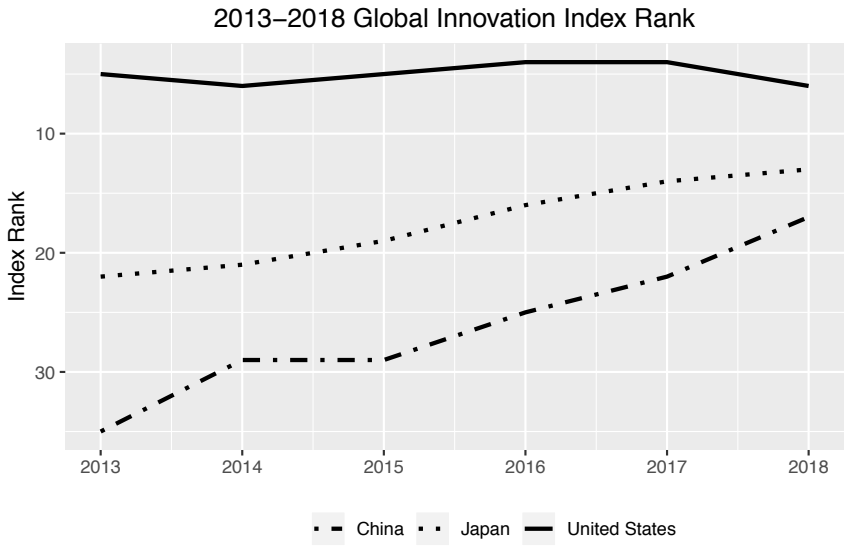

Figure 3. Global Innovation Index Rankings 2013-2018

The second reason why the drastic increase in patent filings is important is that the cases of the United States and Japan suggest that countries' views toward and willingness to enact as well as enforce intellectual property laws track their level of not just absolute, but also relative economic development. The United States was resistant to adopting strong protections during its early stages of development, wanting to borrow liberally from the fruits of earlier-movers like Great Britain. Japan reacted the same way, initially wishing to benefit from its

23. Cornell University, INSEAD, & World Intellectual Property Organization, *Global Innovation Index 2018: Energizing the World with Innovation*, WIPO (2018), https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2018.pdf [https://perma.cc/FRL3-BQ3C].

24. *See* Fred Imbert, *White House Advisor Kudlow Says Apple Technology May Have Been 'Picked off' by China*, CNBC para. 2 (Jan. 4, 2018), https://www.cnbc.com/2019/01/04/white-house-advisor-kudlow-says-apple-technology-may-have-been-picked-off-by-china.html [https://perma.cc/AX7E-DYJC].

own earlier-mover, the United States, until it reached a certain level of wealth. Today, Japan's intellectual property production is increasing at a rapid pace.[25] Modern history is replete with examples where the United States and Japan agree and at times join forces when it comes to pushing for stronger intellectual property protections at both the national and international levels. The two countries emphasize intellectual property protections that weave together civil and criminal measures, and they advocate for the need for proper legal incentives for creation and invention. They both tend to favor a combination of greater sanctions and more powerful enforcement in the international arena, often clashing with countries that do not share the same priorities. China may have reached its own turning point as Chinese companies have begun to assert their patents against companies and competitors in other countries. While China may have historically responded to threats and obligations accepted under international treaties (and even then, far from the level that earlier-movers expected to see), other motivations now seem to be driving the country's behavior.

A. Intellectual Property and Development in the United States

The Founding Fathers understood the importance of including an intellectual property system as they were drafting the Constitution, and they specified in the Intellectual Property Clause of the document that Congress must have the power "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[26] This language was drawn from England's Statute of Anne, which has since become known as "the source of Anglo-American copyright law."[27]

That said, and while the United States became an innovation hub in modern history that sought to advocate for the enforcement of international standards against intellectual property piracy:

> In the nineteenth century, it was a post-colonial nation, its cultural life derivative and its economy underdeveloped [which] declined to participate in international copyright agreements. Only by the end of the

25. *See* Bloomberg, *Japan's Intellectual Property Generating Revenue at Record Pace*, JAPAN TIMES para. 1 (Jan. 16, 2018), https://www.japantimes.co.jp/news/2018/01/16/business/economy-business/japans-intellectual-property-generating-revenue-record-pace/#.W5AVq5NKiu4 [https://perma.cc/676G-4BQ7] (noting that revenue from intellectual property increased by 74% over the previous five years and reached record heights in 2017).

26. U.S. CONST. art. I, § 8, cl. 8.

27. Oren Bracha, *The Adventures of the Statute of Anne in the Land of Unlimited Possibilities: The Life of a Legal Transplant*, 25 BERKELEY TECH. L.J. 1427, 1427 (2010).

> nineteenth century, after the United States had joined the ranks of the world's major industrial powers, did the government adopt legislation protecting the intellectual property of non-U.S. citizens.[28]

In that sense, there was some potential tension between the universalist, Enlightenment-motivated sentiments that the Founders enshrined in the Constitution versus the narrower interests in pre-Constitution state copyright laws and post-Constitution national copyright laws proposed and passed by other politicians.[29]

The United States initially refused to grant copyright protection to foreign authors, which especially hurt English authors; indeed, "[b]etween 1800 and 1860, almost half of the bestsellers in the United States were pirated mostly from English novels."[30] Some English authors (including Charles Dickens and Anthony Trollope) managed to get special protections such that American publishing houses promised not to publish "editions of a foreign work that w[ere] already the subject of an agreement between its author and another publishing house," which enabled the authors to make money through so-called "courtesy copyright" even if they did not officially benefit from U.S. copyright laws.[31] This system eventually failed, as did initial attempts at bilateral treaties between the United States and Great Britain.[32] "Congress [ultimately] did not grant any protection to foreign authors until the 1870s," which also resulted in American authors experiencing the same discrimination in foreign countries.[33]

Other nations alleviated the problem associated with protecting foreign works by joining the Berne Convention for the Protection of Literary and Artistic Works in 1886, a step that the United States did not take for over a hundred years, namely until 1989.[34] The importance of the Berne Convention cannot be overstated. It marked, to some, "the point at which the ramshackle and disorganized collection of bilateral treaties inevitably gave way to the rationality of a multilateral regime that

28. Thomas Bender & David Sampliner, *Poets, Pirates, and the Creation of American Literature*, 29 N.Y.U. J. INT'L L. & POL. 255, 255 (1997) (citing AUBREY J. CLARK, THE MOVEMENT FOR INTERNATIONAL COPYRIGHT IN NINETEENTH-CENTURY AMERICA (1960)).

29. *See id.* at 258 n.11.

30. Yu, *Rise and Decline*, *supra* note 17, at 534 (2012) (citation omitted).

31. *Id*. at 534–35 (citation omitted).

32. *Id.* at 535–36.

33. *Id.* at 537–38 (citations omitted).

34. For a discussion of the background and negotiations surrounding the Berne Convention, *see* Daniel Gervais, Golan v. Holder*: A Look at the Constraints Imposed by the Berne Convention*, 64 VAND. L. REV. EN BANC 147, 147 (2011).

established common standards of copyright protection."[35] It was also a time of uniting the civil and common law traditions of copyright. Indeed, these traditions "were brought together (and simultaneously tainted) in a treaty which stipulated the minimum conditions that signatories had to comply with."[36] All this said, some scholars warn that the shape and membership of the Berne Convention in 1885 were in no way inevitable, but rather hinged on many political forces and contingencies.[37]

In the twentieth century, "the increasing value of intellectual property [was accompanied by] rapid increase in legislative activity, and concomitant lobbying activity."[38] Robert Merges does not believe that lobbying needs to be a cause of concern per se because it is what one would expect when "intellectual property now constitutes a crucial set of corporate assets in the new information economy."[39] He acknowledges that "in some cases increased expenditures may be cause for concern. Both public choice theory and empirical evidence suggest that some types of intellectual property legislation may be prone to excessive private-interest influence, or rent-seeking."[40] In his view, these examples include the extension of copyright terms (which he deems to be almost exclusively the result of such rent-seeking) and special protection when it comes to computer databases.[41]

Patents provide a particularly interesting area of study in the intellectual property public choice landscape. Scholars who conducted empirical research on patent lobbying expenditures and congressional behavior concluded, for example, that:

> Congress does not have a point of view independent from the stakeholders in the patent system. Rather, their votes on the Patent Reform Act of 2007, H.R. 1908, reflect the participation and preferences of major stakeholders, such as the information technology industry, the pharmaceutical industry, the law associations, and the manufacturing sector.[42]

35. Lionel Bently & Brad Sherman, *Great Britain and the Signing of the Berne Convention in 1886*, 48 J. COPYRIGHT SOC'Y U.S.A. 311, 311 (2001) (citations omitted).

36. *Id.* at 312.

37. *Id.* at 339–40.

38. *See* Robert P. Merges, *One Hundred Years of Solicitude: Intellectual Property Law, 1900–2000*, 88 CAL. L. REV. 2187, 2189 (2000).

39. *Id.* at 2235.

40. *Id.* at 2236.

41. *See id.*

42. Jay P. Kesan & Andres A. Gallo, *The Political Economy of the Patent System*, 87 N.C. L. REV. 1341, 1413 (2009).

This reflects a larger trend on the part of the pharmaceutical and biotechnological industries to advocate for stronger property rights, while large corporations specializing in software and information technology tend to prefer reduced protection.[43] The large software and IT companies fear "becoming hostage to small companies' patents" and thus favor less stringent enforcement.[44] Given the flexibility of congressmen when it comes to their patent policy votes, any relative increases in power on the part of pro-patent entities can lead to legislative proposals to increase patent infringement sanctions and/or enforcement.[45]

One of the mechanisms enabling proponents of stronger intellectual property protection is also that, generally speaking, once laws with relatively low penalties are passed, it can become comparatively easier to raise said sanctions over time.[46] This has had dramatic effects especially in the copyright arena, where the law covered an increasing number of behaviors and toughened its sanctions, which included the use of statutory sanctions against large-scale file-sharers in ways that the drafters could have never predicted.[47] This ratcheting effect did not encounter significant pushback from individual citizens and large media companies until the negative responses to the introduction of the Stop Online Piracy Act (SOPA) and Preventing Real Online Threats to Economic Creativity and Theft of Intellectual Property Act (PIPA or PROTECT IP Act), which both sought to address to a greater degree online IP offenses.[48] Around the same time, there was also public upheaval about the prosecution and suicide of internet activist and IP infringer Aaron Swartz.[49]

The last decade has thus brought with it a level of popular attention to and intervention into copyright policy that was essentially unprecedented. Patent policy, on the other hand, is still largely driven by the views of the big players. Most individuals generally do not become embroiled in patent infringement, but—as is the case for trademark

43. *Id.* at 1401.

44. *Id.* at 1370.

45. *See* Irina D. Manta, *The Puzzle of Criminal Sanctions for Intellectual Property Infringement*, 24 HARV. J.L. & TECH. 469, 512 (2011) [hereinafter Manta, *Puzzle of Criminal Sanctions*].

46. *See* Irina D. Manta, *The High Cost of Low Sanctions*, 66 FLA. L. REV. 157, 178 (2014).

47. *See id.* at 179–184.

48. *Id.* at 189–93.

49. *See, e.g.*, Steven Musil, *Researchers Honor Swartz's Memory with PDF Protest*, CNET (Jan. 13, 2013), https://www.cnet.com/news/researchers-honor-swartzs-memory-with-pdf-protest/ [https://perma.cc/98E7-43WY].

infringement—this could change if technologies like 3D printing become more widely used and present new risks to intellectual property owners.[50]

The political landscape of American intellectual property law has generally been dominated by growth in value leading to a greater interest in protection. This expansion has not been entirely unbridled, as exemplified by safety valves such as the fair use doctrines in copyright and trademark law, or ultimately the broad pushback in the years leading up to and during the SOPA/PIPA Era. The large intellectual property owners have also had public relations limitations placed on them. For example, the Recording Industry Association of America (RIAA) mostly ceased pursuing individual users after popular backlash and the RIAA's expenditure of significant amounts of legal fees in exchange for little recovery.[51]

In the international context, after it reached developmental parity with other nations and with few exceptions like its initial reluctance to join the Berne Convention, the United States has been one of the major advocates of stronger sanctions and greater enforcement because that is what it sees as promoting the interest of its intellectual property producers. Like international intellectual property scholar Graeme Dinwoodie has stated, "as the leading exporter of intellectual property in the world, the United States is a strong advocate for treaty membership and implementation."[52] Indeed, "[b]y the twentieth century, the United States was a leader in technological development and one of the world's military and economic leadership superpowers," which led in 1994 to its advocacy for the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS).[53] One of the goals was to provide "a global disincentive to infringe patented products that were placed into the global stream of commerce."[54]

The trajectory of the United States' role in treaty negotiation and adoption is not particularly subtle: At the beginning of the nation's

50. *See* Irina D. Manta, *Intellectual Property and the Presumption of Innocence*, 56 WM. & MARY L. REV. 1745, 1780 (2015) (discussing this issue in the context of trademarks).

51. *See* Manta, *supra* note 45, at 514 (citing Ray Beckerman, *Ha Ha Ha Ha Ha. RIAA Paid Its Lawyers More Than $16,000,000 in 2008 to Recover Only $391,000!!!*, RECORDING INDUSTRY VS THE PEOPLE (July 13, 2010), http://recordingindustryvspeople.blogspot.com/2010/07/ha-ha-ha-ha-ha-riaa-paid-its-lawyers.html [https://perma.cc/GL5Q-TGWP]).

52. GRAEME B. DINWOODIE ET AL., INTERNATIONAL AND COMPARATIVE PATENT LAW 233 (2002).

53. Simone A. Rose, *The Supreme Court and Patents: Moving Toward a Postmodern Vision of "Progress"?*, 23 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1197, 1220 (2013).

54. *Id.* at 1221 (citing Todd Rowe, *Global Technology Protection: Moving Past the Treaty*, 4 MARQ. INTELL. PROP. L. REV. 107, 138 (2000) (identifying this task as the key reason for American negotiators to work with foreign ones to reach international intellectual property agreements)).

history, the United States' role as an intellectual property consumer led to an appetite for free use of other countries' works. As the United States developed economically and moved from being a later-mover to an earlier-mover, it began demanding that other countries respect the boundaries of its patented inventions, copyrighted works, and trademarked goods. It will likely continue to do so unless it experiences a tipping point in maintaining its pole position in the hierarchy of intellectual property producers.

B. Intellectual Property and Development in Japan

While the United States was arguably a later-mover in industrialization vis-à-vis Great Britain, Japan was an across-the-board later-mover when American gunboats under Matthew Perry forcibly opened its markets to the world in 1853 by pressuring Japan into a trade treaty with the United States. That treaty was quickly followed by a series of similar trade treaties with other Western powers. Already beset by numerous domestic challenges and general dynastic decline, the Tokugawa Shogunate did not survive the humiliation of the unequal treaties imposed upon it, and in 1868 the Shogunate was ended by the Meiji Restoration.[55] Coming during a period of Tokugawa dynastic decline, the treaties galvanized young, reform-minded samurai to organize around the emperor to overthrow the Shogunate and to enact reforms that would safeguard Japan from the Western encroachment that Japan and other East Asian countries increasingly suffered. As one of its first acts, in 1871, the new Meiji government sent the Iwakura Mission to all Western countries with whom it had been compelled to sign treaties. Led by Tonomi Iwakura, the mission had three goals: to make goodwill visits with the fifteen heads of state with whom Japan had been forced into diplomatic relations; to sound out these foreign governments on the possibility of renegotiating the unequal treaties Japan had been compelled

55. The Tokugawa Shogunate was the *de jure* feudal military government that ruled Japan between 1603 and 1868. John Whitney Hall, *Introduction*, *in* 4 CAMBRIDGE HISTORY OF JAPAN: EARLY MODERN JAPAN 4 (John Whitney Hall ed., 1991). *See generally* Joseph R. Strayer, *The Tokugawa Period and Japanese Feudalism*, *in* STUDIES IN THE INSTITUTIONAL HISTORY OF EARLY MODERN JAPAN (John Whitney Hall & Marius B. Jansen eds., 1968). The Meiji Restoration, enacted by the Meiji government that succeeded the Tokugawa Shogunate, was the series of political, social, and economic reforms that created modern Japan, turning it from a feudal country to an industrialized, developed country. Marius B. Jansen, *Introduction*, *in* 5 CAMBRIDGE HISTORY OF JAPAN: THE NINETEENTH CENTURY 5 (Marius B. Jansen ed., 1989). *See generally* WILLIAM G. BEASLEY, THE MEIJI RESTORATION (1972); JOHN H. SAGERS, ORIGINS OF JAPANESE WEALTH AND POWER: RECONCILING CONFUCIANISM AND CAPITALISM, 1830–1885 (2006).

to sign in the aftermath of the Perry Expedition; and finally, "to learn firsthand about the West and ferret out its secrets for success."[56]

While it might seem a long time ago today, the Meiji era continues to be important for modern Japan, especially when considering postwar industrial policy and intellectual property laws. Industrial policy goes back to the Meiji era, as do the roots of the fabled Ministry of Commerce and Industry and its successor, the Ministry of International Trade and Industry (MITI).[57] The Meiji Restoration also illustrates the level of institutional transformation required to successfully industrialize, and the comprehensive knowledge transfer that informed that institutional transformation.

The Iwakura Mission represents one of the most important and most organized campaigns of knowledge transfer in modern history. The Mission was assisted in its many ports of call by Japanese nationals who were sent out by the Meiji government to study in the West.[58] After quickly concluding meetings with the officials of host governments, the Mission spread out to study the political, economic, and social systems of the countries it visited. Its members were animated by two questions:

> First . . . . How did the West come to arrive at its contemporary condition? To what, that is, could one attribute the wealth, power, and cultural achievements that seemed so evident everywhere in the United States and Europe. Second, how might the island nation of Japan . . . shape its own quest for modernity so that it too might enter the ranks of the world's advanced nations.[59]

Over the course of two years of close study of the West, the Japanese missioners found that the wealth and power they observed was the product of a specific historical process which had given the West a significant lead over Japan. However, that lead appeared to be only of some 40 years, and it could be closed and overcome with the right policies.[60] One critical way in which that gap could be closed would be through education:

56. JAMES L. MCCLAIN, JAPAN: A MODERN HISTORY 202 (2002) [hereinafter MCCLAIN, MODERN HISTORY].

57. CHALMERS JOHNSON, MITI AND THE JAPANESE MIRACLE: THE GROWTH OF INDUSTRIAL POLICY, 1925–1975 31, 81-111 (1984).

58. Ian Nish, *Introduction, in* THE IWAKURA MISSION IN AMERICA & EUROPE: A NEW ASSESSMENT 6–8 (Ian Nish ed., 1998).

59. MCCLAIN, MODERN HISTORY, *supra* note 56, at 173.

60. Marlene J. Mayo, *Rationality in the Meiji Restoration: The Iwakura Embassy, in* MODERN JAPANESE LEADERSHIP: TRANSITION AND CHANGE 357–58 (Bernard S. Silberman & H.D. Harootunian eds., 1966).

> We clearly must have schools if we are to encourage our country's development as a civilized country, improve ordinary people's knowledge, establish the power of the state, and maintain our independence and sovereignty. . . . Our people are no different from the Americans or Europeans of today: it is all a matter of education or lack of education.[61]

The conclusion was that of the many reforms the Meiji government had to make, education was among the most important. Already in 1872, before the end of the Iwakura Mission, the Meiji government created a modern school system with four-year compulsory education for boys *and* girls, likely based on the observation that in the advanced West both boys and girls were educated. As in the West at the time, education was seen as a way to impart useful skills, inculcate loyalty to the national state, and promote nationalism.[62] As such, education was intimately linked with the overall Meiji project of attaining the "wealth and power" needed to survive in a hostile international system where the strong ate the weak.

The focus on education by the Meiji government is important for two reasons. On the one hand, human capital formation plays an important and in fact critical role in long-term economic growth.[63] On the other hand, the importance of education illustrates the transformative change that the Meiji leadership undertook. Japanese development strategy was not limited to importing any specific technique, technology, or body of science, as it was in nineteenth-century Khedivate Egypt.[64] The Meiji initiative to transform Japan was rooted in the Iwakura Mission's perception that the West's "wealth and technological advances were the products of customs and institutions that were fundamentally different from those in China and Japan."[65] Beyond working on education, Meiji reformers also sought to transform the legal system.

---

61. TAKAYOSHI KIDO, 2 KIDO TAKAYOSHI NIKKI: THE DIARY OF TAKAYOSHI KIDO 126–27 (1933) (see comment – page 54 in Irokawa). TAKAYOSHI KIDO, 4 KIDO TAKAYOSHI MONJO: THE PAPERS OF TAKAYOSHI KIDO 320 (1933) (see comment – page 55 in Irokawa).

62. MCCLAIN, MODERN HISTORY, *supra* note 56, at 179, 260–263. *See generally* EUGEN WEBER, PEASANTS INTO FRENCHMEN: THE MODERNIZATION OF RURAL FRANCE 1870–1914 (1976); JOHN BOLI, NEW CITIZENS FOR A NEW SOCIETY: THE INSTITUTIONAL ORIGINS OF MASS SCHOOLING IN SWEDEN (1989); ANDY GREEN, EDUCATION AND STATE FORMATION: THE RISE OF EDUCATION SYSTEMS IN ENGLAND, FRANCE AND THE USA (1990); BENEDICT ANDERSON, IMAGINED COMMUNITIES: REFLECTIONS ON THE ORIGIN AND SPREAD OF NATIONALISM (2006).

63. Barbara Sianesi & John Van Reenen, *The Returns to Education: Macroeconomics*, 17 J. ECON. SURVS. 157, 157 (2003).

64. DAVID S. LANDES, THE WEALTH AND POVERTY OF NATIONS: WHY SOME ARE SO RICH AND SOME SO POOR 403–07 (1999) (describing Egyptian attempts to develop a textile industry based on Jumel cotton by importing European mechanization).

65. SAGERS, *supra* note 55, at 95.

That law was fundamental to the functioning of a modern country and its economy was not a hard argument to make in nineteenth-century Japan. Impersonal law[66] (before which everyone was equal)[67] administrated by a meritocratic bureaucracy in a highly centralized state has deep roots in Chinese and Japanese political theory, thought, and practice.[68] However, law was primarily administrative and used "to maintain power and policy."[69] It was seen as an "instrument for the complete control of all citizens by the government; punishments were made severe enough to have exemplary effect upon the whole people; stern surveillance over the feudal barons and people insured peace and order; and government control was applied to economic activities."[70] In other words, the legal system filled a practical function by furthering the interests of a state. However, Japan's legal system seemed arbitrary to Western observers, and Meiji reformers realized that Japan could not hope to revise the unequal treaties imposed upon it until the country, in the eyes of the West, "became a nation governed in accordance with rational laws."[71] A constitution and legal system more recognizable by the West were needed, and both were cobbled together largely using foreign models.[72] Japan has a civil law system because this framework is easier to implement from scratch. The civil code was modeled on both German and French law,[73] while its commercial code was largely inspired by German example.[74]

The first patent law was created in 1871, several years before the civil and commercial codes were finalized, but it was considered a failure and quickly abolished.[75] The promulgation of the law became a priority because a patent system in general—and definitely one like the United States'—was seen as critical not necessarily to reward inventors, but to

66. VICTORIA TIN-BOR HUI, WAR AND STATE-FORMATION IN ANCIENT CHINA AND EARLY MODERN EUROPE 103 (2005).

67. *Id.* at 172.

68. Kia-Ngau Chang, *The Influence of Legalism Upon Japanese Government and Economy*. 3&4 TSING HUA J. CHINESE STUD. 1 (1963). *Cf.* SAGERS, *supra* note 55.

69. Dan Fenno Henderson, *Evolution of Tokugawa Law, in* STUDIES IN THE INSTITUTIONAL HISTORY OF EARLY MODERN JAPAN 214 (John W. Hall & Marius B. Jansen eds., 1968).

70. Chang, *supra* note 68, at 10.

71. MCCLAIN, MODERN HISTORY, *supra* note 56, at 185.

72. JOSEPH PITTAU, POLITICAL THOUGHT IN EARLY MEIJI JAPAN, 1868-1889 131–157 (1967); Daikichi Irokawa. *The Impact of Western Culture*. *in* CULTURE OF THE MEIJI PERIOD 56–58 (1985).

73. HIROSHI ODA, JAPANESE LAW 113–17 (3d ed. 2009).

74. Tomotaka Fujita, *The Commercial Code in Japan*, *in* 2 CODIFICATION IN EAST ASIA: SELECTED PAPERS FROM THE 2ND IACL THEMATIC CONFERENCE 122 (Wen-Yeu Wang ed., 2014); ODA, *supra* note 73, at 117.

75. Tom Nicholas & Hiroshi Shimizu, *Intermediary Functions and the Market for Innovation in Meiji and Taishō Japan*, 87 BUS. HIST. REV. 121, 136 (2013).

encourage innovation.[76] In 1885, a new patent law was promulgated, and the ministry that would one day become MITI (rather than the Ministry of Justice) was given responsibility for patents. While Japan had bilateral treaties with a limited number of countries, it waited until 1899 to join the Paris Convention, which allowed foreigners to patent in Japan.[77] In 1899 Japan also joined the Berne Convention for the Protection of Literary and Artistic Works. This is, of course, similar to the United States' pattern of not extending intellectual property protection to foreigners until quite late. To no small degree, joining these conventions was part of the larger Meiji project of having the country be released from "semicolonial status" and reaching "acceptance into the comity of great powers."[78]

Already by the early twentieth century, there was a well-functioning domestic market for patents, suggesting a well-ordered system.[79] Furthermore, not only did American companies such as General Electric register thousands of patents in Japan, Japanese innovations were frequently patented in the United States.[80] By the middle of the 1880s, patents per capita in Japan were rising rapidly, and over the course of forty years, Japan went from 0.6 percent of the United States' figure to 15 percent.[81] Meiji-era investments in education and innovation paid quick dividends, with increasing licensing of patents by Japanese to foreign companies and significant independent technical advances.[82] In a qualitative and quantitative study examining "the role of domestic inventive activity versus international transfers of knowledge," Tom Nicholas finds extensive support for "the idea of a dynamic Japanese innovation sector," and for the idea that "Japanese inventors drove the level and structure of inventive activity towards that observed in technologically advanced nations."[83] In other words, in the pre-war period, the Japanese patent system was considered reliable by foreign companies. Far from simply reimplementing Western technology, Japanese companies were able to innovate independently.

In Japan, given the apparently good evidence for support for intellectual property protection and more significantly production, the

76. *Id.* at 135–36.

77. *Id.* at 137.

78. MCCLAIN, MODERN HISTORY, *supra* note 56, at 283.

79. Nicholas & Shimizu, *supra* note 75.

80. Shigehiro Nishimura, *International Patent Control and Transfer of Knowledge: The United States and Japan Before World War II*, 9 BUS. & ECON. HIST. 1, 9 (2011).

81. Nicholas & Shimizu, *supra* note 75, at 130.

82. *Id.* at 132.

83. Tom Nicholas, *The Origins of the Japanese Technological Modernization*, 48 EXPLORATIONS IN ECON. HIST. 272, 288 (2011).

overall picture of protection and infringement is muddled by the post-war complaints of widespread patent infringement and "unfair competition."[84] John Lindgren and Craig Yudell stated in 1994:

> According to recent Tokyo press reports, the United States and Japan are once again at war–this time, though, it is a "Patent War." Over the last decade, American companies have become extremely aggressive in seeking worldwide protection from infringement of their intellectual property. American corporations have recently focused their efforts on the high-tech companies of Japan. These American companies have gone beyond asserting U.S. patents against imports of Japanese companies in the United States and are now actively pursuing patent protection against Japanese companies in Japan itself. Those Japanese companies, of course, are responding in kind, spending large amounts of money and labor on patent acquisition, both in Japan and in the United States.[85]

The authors present clear examples of what can perhaps charitably be called questionable behavior by Japanese companies and by the Japanese patent office, chief among which is the thirty-year processing time for Texas Instruments' Kilby patent of the integrated circuit.[86] This respite allowed Japan to develop its own semiconductor industry. That is not to say that the delay was a complete loss for Texas Instruments. Being awarded a patent in 1989, as opposed to 1959, proved lucrative to the company because Japan's semiconductor industry was by the late 1980s several orders of magnitudes larger than it had been in the late 1950s, and the company's royalties were correspondingly larger.[87]

Given the technical proficiency and innovativeness of Japanese industry before the war, it seems unlikely that Japanese infringement was as widespread as claimed in the American press. More likely is perhaps that while Japan had massive production capacity (a high capacity for innovation especially in the reductions of cost and complexity) but comparatively little intellectual property, the United States at the time had less production capacity (was less able or willing to produce at low cost) but had comparatively more intellectual property.[88] In retrospect, it would seem that patents were wielded by American companies, and by extension

84. *See* Robert B. Reich, *Is Japan Out to Get Us?*, N.Y. TIMES para. 5 (Feb. 9, 1992), https://www.nytimes.com/1992/02/09/books/is-japan-out-to-get-us.html [https://perma.cc/G4PS-Y7RT].

85. Lindgren & Yudell, *supra* note 15, at 2.

86. *Id.* at 7.

87. *Id.* at 8.

88. *Id.* at 4.

the American government, to negate the Japanese later-mover advantage in high technology.

Over the course of the 1990s, headlines about Japanese-American patent wars disappeared when Japan entered its Lost Decade (a decade-long period of economic stagnation following the collapse of an asset bubble). Increasing competition from other East Asian economies coincided with the ability of the United States to take a commanding lead in the computer revolution, which included companies like IBM, Intel, Microsoft, Hewlett Packard, Dell, and Apple leveraging the unique innovation pipeline of Silicon Valley.[89] With the acquisition and production of vast amounts of intellectual property (not least the copyrighted material owned and produced by the film and music studios that were bought by Japanese companies), Japan in the 1990s found itself like the United States before it with less and less production capacity relative to the rapidly expanding value of its intellectual property.[90] After a decade of antagonism, the Japanese and United States governments began cooperating on strengthening intellectual property protection domestically as well as internationally. Later-mover Japan had by the 1990s become an earlier-mover relative to the rest of East Asia in general, and to China in particular.

C. Intellectual Property and Development in China

While 2018 saw the fortieth anniversary of the beginning of the Opening Up and Reform Era in China, it also witnessed the anniversary of another series of policies that were in some ways more consequential, the 1898 Hundred Days of Reform. Thirty years after Japan's Meiji Restoration, China's Qing Dynasty began its own (eventually aborted) attempts to self-strengthen.[91] Those ultimately failed to have an effect, with the emperor who initiated them *de facto* deposed, and with key would-be reformers punished. The continued dynastic decline and popular hardship set off an increasingly frantic search for a solution to China's travails. As miseries multiplied, intellectuals became ready to jettison any knowledge or traditional practice that did not promote the national imperative of restoring China's wealth and power. As had been the case in Japan, regardless of provenance, any knowledge or practice that had

89. *See generally* Samuelson, *supra* note 16.

90. Sadao Nagaoka, *Determinants of High-Royalty Contracts and the Impact of Stronger Protection of Intellectual Property Rights in Japan*, 19 J. JAPANESE & INT'L ECONS. 233, 235 (2005).

91. Shiping Hua, *The Meiji Restoration (1868) and the Late Qing Reform (1898) Revisited: Strategies and Philosophies*, 21 EAST ASIA 3, 6 (2004).

practical value would be adopted.[92] While Japan had seemed a promising model to many, in the end the Soviet Union's anti-imperialism and success in "turning a poor agrarian economy into an industrial powerhouse" made communism the more attractive model to China.[93]

In the early twentieth century, for many poor countries the model of the Soviet Union seemed to offer the fastest method for achieving wealth and power. The acceptance of Marxist-Leninism was in the case of China never slavish, and Chinese leadership has been willing to learn from foreign and domestic[94] examples and experiments. Like Japan, China made full use of the later-mover advantage as it used, experimented with, and implemented social, economic, and political reforms.

The first thirty years of the new republic saw massive basic infrastructure investments, human capital formation, and the creation of a manufacturing base. While these investments all became important for the explosive economic growth in the last decades of the twentieth century,[95] the human capital investments of earlier decades played a particularly large role.[96] China had begun the twentieth century with one of the lowest literacy rates among twenty to twenty-four year olds, and by the time of the Opening Up and Reform Era, it had (among the young) literacy rates similar to those of the West.[97] By the time of the Reform Era, Chinese labor was cheap (as in low-cost, but highly qualified) compared to other developing countries outside of East Asia.

92. ORVILLE SCHELL & JOHN DELURY, WEALTH AND POWER: CHINA'S LONG MARCH TO THE TWENTY-FIRST CENTURY loc. 80–108 (2013) (ebook).

93. NILS GILMAN, MANDARINS OF THE FUTURE: MODERNIZATION THEORY IN COLD WAR AMERICA 42 (2003).

94. *Cf.* Sebastian Heilmann, *Policy Experimentation in China's Economic Rise*, 43 STUD. COMP. INT'L DEV. 1 (2008).

95. Y. Y. Kueh, *The Maoist Legacy and China's New Industrialization Strategy*, 119 CHINA Q. 420, 422 (1989).

96. JEAN DREZE & AMARTYA SEN, INDIA: ECONOMIC DEVELOPMENT AND SOCIAL OPPORTUNITY 73–75 (1995). *See also* Amartya Sen, *Passage to China*, N.Y. REV. BOOKS (Dec. 2, 2004), https://www.nybooks.com/articles/2004/12/02/passage-to-china/ [https://perma.cc/4ZJF-K7DZ]; *Amartya Sen, What China Could Teach India, Then and Now*, ASIA SOC'Y (Feb. 17, 2005), https://asiasociety.org/amartya-sen-what-china-could-teach-india-then-and-now [https://perma.cc/VT58-55TQ].

97. Ottervik, *supra* note 3.

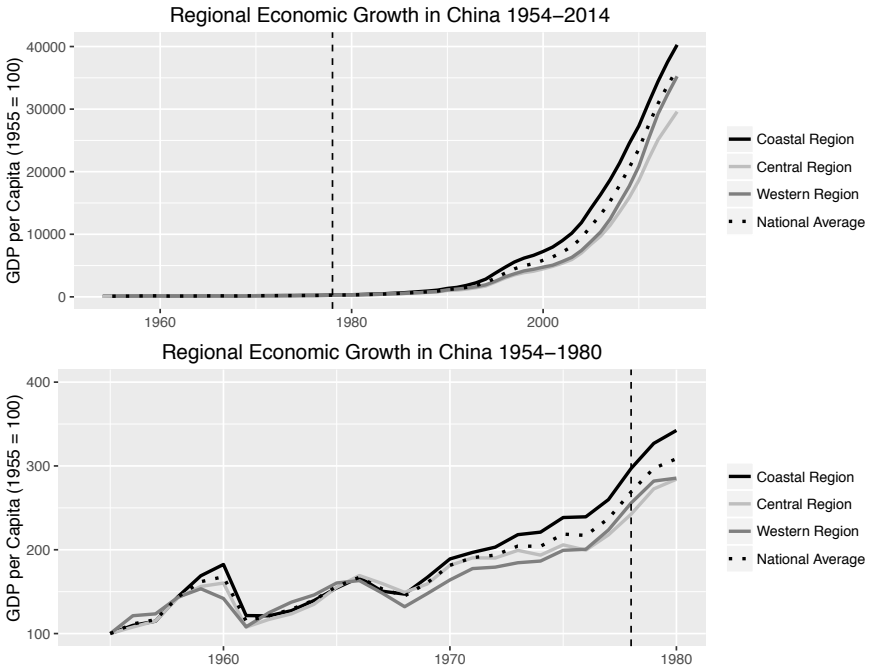

Figure 4. Regional Economic Growth in China 1954–2014

In terms of economic growth, the significant difference between the pre- and post-Reform Era was stability of growth, and not the absence or presence of growth itself. The average yearly economic growth rate between 1953 and 1978 was 6.5%; between 1978 and 2008 this number was 9.9%. Either number puts China in line with the economic growth of the rest of East Asia in the same time period. The significant difference between the two time periods was that before 1978, economic growth rates were subject to wild swings, with a 50% difference between peaks and troughs, while later economic growth was more stable and predictable.[98] These swings were the most violent in the first twenty years, and from the end of the 1960s, GDP per capita grew consistently. As shown in Figure 4, the apparent lack of economic growth before the Reform and Opening Up Era is largely a product of the scale of the cumulative post-Reform economic growth.[99] While GDP per capita for any year might be arguable, the trend is congruent with improvements in

98. Shaoguang Wang, *Steadfastly Maintain Our Direction and Explore New Roads: Sixty Years of Socialist Practice in China*, 31 SOC. SCI. CHINA 21, 29 (2010).

99. CHINA DATA ONLINE, https://www.china-data-online.com/ [https://perma.cc/8K8A-HCMR].

education, health, and agricultural productivity.[100] Furthermore, as argued by Amartya Sen and others, the economic growth of China is the product, not the driver, of human capital investments made over long periods of time. China chose a development strategy that, in broad strokes, was not too dissimilar from that of the rest of East Asia, which is to say significant upfront investments in education, agricultural productivity, and economic equality, with largely similar long-term results—high economic growth.

Unlike China's economic development, China's modern legal system is a more recent phenomenon. At the foundation of the People's Republic, large parts of the country had been outside the control of the central government for decades. State-building—along with the construction of a legal system—was a critical task for the new government. The first decade of the new republic was largely one of institutionalization and legalization, with the promulgation of the first constitution in 1954, and with the building of a judicial system. The 1960s and early 1970s, by contrast, saw extensive deinstitutionalization and deprofessionalization.[101] By the 1980s, two-thirds of all judges lacked law degrees, and before the 1995 Judges' Law, "judges in China were not treated as legal professionals."[102] The reason why such a small percentage of judges had a formal judicial education was that the newly reopened "Ministry of Justice announced in 1982 that no less than 57,000 'outstanding army officers' [were] given [abbreviated] legal training, prior to being assigned to the court system."[103] These judges were complemented by about 200,000 "judicial workers" who were to serve as what might be called "barefoot" lawyers.[104]

In China, as in Japan, rule by law is a tradition with long roots, and the judicial system filled primarily an administrative as opposed to a judicial function.[105] After 1995, the judicial system was quickly professionalized, and "[t]he proportion of judges holding [legal] degrees

100. *See generally* Chris Bramall, *Origins of the Agricultural "Miracle": Some Evidence from Sichuan*, 143 CHINA Q. 731 (1995); Zhun Xu, *The Chinese Agriculture Miracle Revisited*, 47 ECON. & POL. WKLY. 51 (2012).

101. Kam C. Wong, *The Police Legitimacy Crisis and Police Law Reform in China: Part I*, 6 INT'L J. POLICE SCI. & MGMT. 199, 206 (2004).

102. Weixia Gu, *Courts in China: Judiciary in the Economic and Societal Transitions*, *in* ASIAN COURTS IN CONTEXT 495 (Jiunn-Rong Yeh & Wen-Chen Chang eds., 2014).

103. JONATHAN D. SPENCE, THE SEARCH FOR MODERN CHINA 705 (1990).

104. *Id.* ("Barefoot" refers to the "barefoot doctors," individuals who during the 1960s received medical training, but not a degree, and then traveled from village to village to tend to medical needs.).

105. Thomas Carothers, *The Rule of Law Revival*, FOREIGN AFF. (March/April 1998), https://www.foreignaffairs.com/articles/1998-03-01/rule-law-revival [https://perma.cc/4P6Z-TTSG] (distinguishing rule by law from rule of law); Gu, *supra* note 102, at 487.

increased from 7 percent in 1995 to 56 percent in 2006."[106] For the first decades after the Opening Up and Reform Era, China was, for most intents and purposes, without a recognizable judicial system. In the years leading up to and following China's accession to the WTO, the government made strenuous efforts to provide broader legal training, but the relationship between judicial and administrative power in China will be complex for the foreseeable future.[107]

As was the case in Japan some 110 years previously, a discussion of the role of patents in economic development had taken place before the creation of a modern legal system in China.[108] A law protecting the proprietary rights of an inventor had been promulgated in the early 1950s, but it was superseded in 1963 by new regulations which emphasized the importance of freely sharing information.[109] In 1978, the rights of an individual inventor were once again recognized, but the tension between individual reward and social benefit created extensive debate.[110]

Just like in Japan a century earlier, the patent system was seen as a means to promote invention, rather than reward individual inventors; inventors received a limited monopoly as remuneration for their work or "distribution according to labor."[111] A patent was seen as a relative right, not an absolute one, and the 1984 Patent Law suggested that "not only is the patentee obligated to work the patent, but the government may grant a compulsory license to a party who exhibits a need to make use of the patented technology."[112] Similar to patents, trademarks were first legally regulated in China in the early 1950s. Exclusive use was abolished in 1963 to make trademarks into signifiers of quality rather than source indicators.[113] A 1981 analysis found that the 1963 regulations had largely not succeeded in safe-guarding quality, and by 1982 a new Trademark Law was promulgated, encouraging manufacturers to grow sales and profits by developing consumer demand for their products.[114]

The purpose of the 1984 Patent Law was manifold: in the (then-) near term, to encourage knowledge transfer by foreign companies by offering

106. Gu, *supra* note 102, at 503 (citations omitted).

107. Jerome Alan Cohen, *China's Legal Reform at the Crossroads*, 2 FAR EASTERN ECON. REV. 23 (2006).

108. L. Mark Wu-Ohlson, *A Commentary on China's New Patent and Trademark Laws*, 6 NW. J. INT'L L. & BUS. 86, 88 (1984).

109. *Id.* at 89–90.

110. *Id.* at 90, 93.

111. *Id.* at 94 (citations omitted).

112. *Id.* at 95.

113. *Id.* at 111.

114. *Id.* at 112–13.

them intellectual property protection; in the medium term, to encourage domestic invention and innovation; and in the very long term, to ensure reciprocal protection and guard Chinese intellectual property from expropriation by foreigners.[115] Intellectual property protection in China was then, as had been the case in Japan, not something imposed from the outside, but rather chosen for its instrumental value. Foreign pressure to strengthen intellectual property protection played a role for its development, but the domestic factors behind the strengthening of intellectual property protection were numerous.[116]

Hand-in-hand with China's economic development, strengthening of domestic (and increasingly exported) brands, and investments in (plus returns to) domestic research and development, China has joined international intellectual property treaties.[117] Initially a quiescent observer, China has become increasingly active in international organizations, and has established bilateral relations in the same way the United States and the European Union have.[118]

The Trump Administration's complaints of rampant intellectual property infringement by China[119] are largely the same as U.S. complaints during the 1980s: "During the 1980s and 1990s, the United States repeatedly threatened China with economic sanctions, trade wars, nonrenewal of most-favored-nation status, and opposition to China's entry into the World Trade Organization (WTO)."[120] As discussed above, for most of this period China was without a judicial system comparable to that found in the West. U.S. and Western complaints of intellectual property infringement were not hard sells in China because strong intellectual property protection was seen as fundamental for long-term economic growth throughout the Reform Era. In 2006 President Hu Jintao remarked that "the building of China's system of intellectual property right [sic] and vigorously upgrading the capacity of creation, management, protection and application regarding intellectual property are our urgent need [sic] for the purpose of enhancing independent and self-driven innovation capabilities and building an innovation-oriented country."[121] In other words, intellectual property production and protection were seen by the top leadership as critical to China's future

115. *Id.* at 91–92.

116. *See generally* Yu, *China Puzzle*, *supra* note 17.

117. Peter K. Yu, *The Middle Kingdom and the Intellectual Property World*, 13 OR. REV. INT'L L. 209, 222 (2011).

118. *Id.* at 223–50.

119. OFFICE OF THE U.S. TRADE REPRESENTATIVE, *supra* note 2.

120. Yu, *Rise and Decline*, *supra* note 17, at 529.

121. *Id.* at 530.

economic development. Ten years later, strengthening intellectual property rights was a key part of Made in China 2025,[122] China's now-downplayed industrial policy.[123]

As shown above in Figure 2, China's policy to increase intellectual property production has borne fruit as trademark and patent applications by Chinese entities have surpassed those of American or Japanese entities. While the quality of some (or even many) of the patents might be debatable, what is important is that in high tech (as shown by strategic patenting[124]), a large quantity of patents has a quality all of its own. A large patent portfolio protects against legal aggression by competitors, and Chinese companies are building large patent portfolios for their protection.[125] Just like Japanese companies, in response to U.S. intellectual property suits, began to acquire and develop their own considerable arsenal of intellectual property—if for no other reason than as a defense—Chinese companies now seem to be doing the same. Given the accelerating rate at which Chinese companies are accumulating patents, this will likely have significant consequences over time in that China could become as enthusiastic an enforcer of its intellectual property rights overseas as the United States and Japan have been in the recent past.

IV. ANALYSIS

In the decades immediately after the Second World War, "Made in Japan" was considered a bit of a joke and a signifier of poor or inferior quality. However, that changed in the 1980s when highly competitive Japanese car and consumer electronics manufacturers made headway in the global and American market. A veritable cottage industry of books critical of Japan and unfair Japanese competition sprung up overnight,[126]

122. ST. COUNCIL OF CHINA (中华人民共和国国务院), NOTICE OF THE STATE COUNCIL ON PRINTING AND DISTRIBUTING "MADE IN CHINA 2025" (国务院关于印发《中国制造2025》的通知) (May 19, 2015), http://www.gov.cn/zhengce/content/2015-05/19/content_9784.htm [https://perma.cc/Y5Y7-LV4C]. *See also* U.S. Chamber of Com., Made in China 2025: Global Ambitions Built on Local Protections (2017).

123. Sidney Leng & Yangpeng Zhen, *Beijing Tries to Play Down 'Made in China 2025' as Donald Trump Escalates Trade Hostilities*, S. CHINA MORNING POST para. 1 (Sept. 29, 2018), https://www.scmp.com/news/china/policies-politics/article/2152422/beijing-tries-play-down-made-china-2025-donald-trump [https://perma.cc/Z4JE-2T9S].

124. Dietmar Harhoff et al., *The Strategic Use of Patents and Its Implications for Enterprise and Competition Policies*, ESMT BERLIN REP. (2007), http://ec.europa.eu/DocsRoom/documents/3427/attachments/1/translations/en/renditions/pdf [https://perma.cc/7DKS-PTCP].

125. *See, e.g.*, Charles Clover, *Xiaomi to Buy 1,500 Patents from Microsoft*, FIN. TIMES (Jun. 1, 2016) https://www.ft.com/content/9ecc1416-27c9-11e6-8b18-91555f2f4fde [https://perma.cc/MEF3-MEWZ].

126. *Cf.* Reich, *supra* note 84.

and U.S. presidential candidates openly mused about whether Americans would be reduced to sweeping the dust from around Japanese computers.[127]

By the 1990s, some of the fear of a Japanese takeover had subsided as investments made decades earlier paid dividends in the United States in the form of the (American) personal computer revolution, and Japan entered its Lost Decade in the aftermath of the collapse of an asset-price bubble.[128] By the late 1980s, Japan found itself with an earlier-mover advantage in many industries and was facing increasing competition from later-movers, especially perhaps from South Korean companies. Furthermore, Japanese companies had acquired significant stakes in film and music studios with global sales, and therefore had an incentive to safeguard intellectual property rights globally. With more intellectual property to protect, Japan became, like the United States before it, an enthusiastic supporter of an international intellectual property regime.

China (whose pillorying by American policymakers and media arguably resembles that meted out to Japan some decades earlier) now seems to be in a similar transition as precipitous rises in the production of intellectual property have been accompanied by increasingly robust intellectual property protection, and enforcement of that protection. China appears to be following the path trod by the United States and Japan to become a serious defender of intellectual property rights. From the examples of the United States, Japan, and China, it seems that whether a country chooses to infringe on versus protect intellectual property depends on the relative value they perceive in the two. This has implications for earlier-movers, like the United States, which perceive themselves to have an edge over apparent competitors in the area of intellectual property. Specifically, the creation of an intellectual property regime that protects earlier-movers from later-movers could be problematic for countries like the United States if the roles are ever reversed. If the hierarchy of movers shifts, the relative interest in intellectual property enforcement will as well, and China could seek to protect its goods against infringement by a future later-mover such as the United States and/or Japan someday.

The change that has already occurred in China's stance is not surprising considering that the widespread international outsourcing of manufacturing has made intellectual property a key asset for its private

127. James Reston, *Mondale's Tough Line*, N.Y. TIMES. para. 4 (Oct. 13, 1982), https://www.nytimes.com/1982/10/13/opinion/washington-mondale-s-tough-line.html [https://perma.cc/42CK-FTZ8].

128. Samuelson, *supra* note 16.

companies, strengthening the general tendencies of earlier-movers to formulate and demand enforcement of strict intellectual property laws. Because Chinese companies like Huawei, Lenovo, and Xiaomi (along with many others) now have valuable brands and intellectual property of their own, it was only to be expected that China's intellectual property regime would be toughened. This is not to say that China's leadership was previously insensitive to the importance of intellectual property for the functioning of a modern economy. As discussed above, a patent law was implemented in the early days of reform, before there was a modern or even recognizably functioning judicial system. The law had been debated for years and was implemented to promote China's technological and economic development.[129] This would suggest that countries like China respond not only to exogenous pressure from earlier-movers like the United States and Japan to increase intellectual property protection, but also to internal motivations.

While the focus of this analysis is on intellectual property, it should be noted that the most critical knowledge transfer to Japan and China involved not proprietary knowledge, but rather institutions. When the United States pilfered the intellectual property and proprietary knowledge of European entities (whether it was private companies wantonly reprinting the works of British authors or the government encouraging illicit transfer of knowledge through migration of engineers),[130] the U.S. had a largely similar institutional framework as its European victims.[131] Western countries shared some form of rule of law, near-universal education, high levels of gender equality implicated in development,[132] and an Enlightenment heritage. The differences that existed between Western countries paled in comparison to the difference between any given Western country and nineteenth-century later-movers like Japan,

129. Wu-Ohlson, *supra* note 108, at 91–92.

130. *See generally* Bingchun Meng, *Property Right or Development Strategy?: Protection of Foreign Copyright in 19th Century America and Contemporary China*, LONDON SCH. OF ECON. & POL. SCI. (2007) https://core.ac.uk/download/pdf/93515.pdf [https://perma.cc/2LZN-QB9B]; Kat Eschner, *How Industrial Espionage Started America's Cotton Revolution*, SMITHSONIAN MAG. (Dec. 20, 2017), https://www.smithsonianmag.com/smart-news/how-industrial-espionage-started-americas-cotton-revolution-180967608/#38rtqhFr6EAO7lkA.99 [https://perma.cc/827Y-MZ57].

131. *See, e.g.,* Dani Rodrik, *Institutions for High-Quality Growth: What They Are and How to Acquire Them*, 35 STUDS. IN COMP. INT'L DEV. 3 (2000).

132. WORLD BANK, ENGENDERING DEVELOPMENT: THROUGH GENDER EQUALITY IN RIGHTS, RESOURCES, AND VOICE 73–106 (2001), http://documents.worldbank.org/curated/en/512911468327401785/pdf/multi-page.pdf [https://perma.cc/UU5G-QC5B].

China, or Turkey. Once committed to development, Japan and China transformed their social, political, and economic institutions.[133]

Both Japan and China show how later-movers have an advantage vis-à-vis earlier-movers; can learn from the successes and failures of earlier-movers; and—through selection and adaptation of development policy, institutions, and technology—can catch up to earlier-movers. For policymakers who are interested in long-term economic competitiveness, it would therefore be worthwhile to look beyond the immediate problems of intellectual property infringement to better understand the policies that support the political, economic, and scientific development of an "unfairly" competing country. As Japan and China found early on, copying current technology has little long-term value by itself. What they needed and what they implemented for their development were the institutions that would allow them to innovate and produce their own intellectual property.

The patterns that apply to successful developers such as the United States, Japan, and China might not hold universally. What is suggested by the experience of these countries, however, is that there is a relationship between earlier-/later-mover status and intellectual property protection. A larger sample of countries is needed to determine whether or not this relationship is universal. Even without a larger sample, it can probably safely be said that intellectual property infringement *per se* is not a shortcut to long-term economic development. All three countries discussed here first had or built the institutions and human capital needed for innovation, and this allowed them to absorb and build off of transferred knowledge.

V. CONCLUSION

The examples of the United States, Japan, and China suggest that countries' views about and willingness to enact as well as vigorously enforce intellectual property laws may track their level of not just absolute but also relative economic development. These countries saw rapid economic growth by first identifying and then building the human and physical infrastructure needed to sustain growth, and then selectively (by means fair and foul) learning from other countries. When the edge regarding useful intellectual property lay with others, these countries tended to (or at least were perceived to) inadequately protect the intellectual property of more developed countries. As later-mover

133. *See generally* MARIUS B. JANSEN, THE MAKING OF MODERN JAPAN (2000); SPENCE, *supra* note 103.

countries developed, their intellectual property laws also became increasingly comprehensive. These countries additionally became more likely to enforce their intellectual property internationally. With economic growth, countries that previously acted as industrial spies and infringers of others' intellectual property seem to become stalwart defenders and maintainers of (their own) intellectual property rights.

The implication of the above is likely that in the long run, while intellectual property protection is important, production is equally if not more important. It is not protection of intellectual property alone that will allow any country to maintain an edge vis-à-vis other countries. Nor is past innovation likely to be of much use in the future unless it is continually built upon. Long-term economic competitiveness appears to be predicated on a capacity to develop new science and technologies. That capacity is likely a product of institutional frameworks. To the extent that a country overemphasizing protection of its old intellectual property distracts it from an examination of the policy initiatives that catapult later-movers to be able to compete (unfairly or not) with earlier-movers, that emphasis could prove to be highly disadvantageous to it in the long term.

Taking a longer perspective on the protection of intellectual property rights and the role they play in the development of earlier-movers and later-movers suggests that while these rights are important, they implicate several policy areas and should not be considered in isolation. As demonstrated by the cases of Japan and China, rapid development is a multi-faceted process, requiring study and coordination of social and economic policy. It would stand to reason that competing with, or keeping pace with, a rapid developer would require the same effort. In 2012, Peter Yu hinted at the possibility that "[t]he changing dynamics in the global economy and the improved technological capabilities in China therefore could result in a role reversal."[134] The years since that statement, and the developments in the U.S. and Chinese political landscapes, may engender this result faster than might have been predicted.

134. Yu, *Rise and Decline*, *supra* note 17, at 556.