

CLOSING THE INSTITUTIONAL GAP: Protecting Technology in Foreign Direct Investment

Siyao Li *

How does foreign direct investment (FDI) affect a state's domestic property protection regime and rule of law? Existing literature argues that foreign investors seek outside institutional guarantees to substitute for weak property protection in host countries. I argue that this external option is limited, especially for technology components of foreign direct investment. I theorize that multinational corporations (MNCs) can seek property protection through host country domestic institutions rather than bypassing them, even in countries with relatively weak rule of law. Using cross national data on research and development investments, I find that foreign technology investment flows positively affect domestic institutions for intellectual property protection, thereby contributing to better rule of law in host countries. Further, I theorize that MNCs employ political strategies that engage with both home and host governments to influence host country institutional development through a two-level bargaining process. I illustrate the logics of the two mechanisms through a case study of General Electric's expansion in China and data on the United State Trade Representative's annual watch list on intellectual property practices in foreign countries.

*PhD candidate, Department of Political Science, University of Pennsylvania.
Email: siyaoli@sas.upenn.edu

1 Introduction

What is the relationship of transnational flows of capital with a state’s domestic institutions? Does foreign direct investment (FDI) influence how host countries’ investment protection regimes develop, and if yes, how? A small number of studies such as [Mosley and Uno \(2007\)](#), [Malesky \(2009\)](#) and [Wang \(2015\)](#) show that foreign direct investment can lead to a “climb to the top” in governance standards in developing countries. Others show that competition for investment among countries prompts a “race to the bottom” in domestic regulations ([Rudra, 2008](#); [Mosley, 2010](#); [Park et al., 2012](#)).¹ While there is ample evidence that FDI affects the development trajectory of host states, much remains to be explored in terms of issue areas and mechanisms that lead from foreign firm activity to institutional changes. Little attention has been devoted to investment protection institutions in developing countries since international forums are often thought to offer protection for FDI and to substitute for weak domestic institutions in the host country ([Arias, Hollyer, and Rosendorff, 2018](#); [Betz and Pond, 2019](#)). However, international forums are not always viable venues for firms to seek protection against state expropriation, and foreign firms still need to resort to domestic institutions in the host country. This paper focuses on host country avenues for property protection, and argues that foreign investments high in intangible assets and technology content, such as research and development, lead to innovative firm strategies that reshape domestic law and its enforcement.

The literature on foreign direct investment has largely studied property as a general category. However, different types of assets are subject to distinct risks and legal status. I disaggregate intangible property from physical property and study intangible assets which are legally protected as intellectual property (IP). In previous decades the commercial value of corporate investment mostly existed in tangible assets such as physically constructed buildings and machinery; today it is increasingly concentrated in intangible assets, such as patents, trade secrets, and research and development.² As Horatio Gutierrez, a vice president at Microsoft claims, “we’re moving toward a global economy where the true strategic asset is IP” ([PricewaterhouseCoopers, 2007](#)).

¹[Arel-Bundock \(2017\)](#) also shows that treaty-shopping by multinational companies in terms of tax rates puts downward pressure on governments to maintain lower tax rates.

²Broadly speaking, intangible assets include intellectual property, software investments, managerial expertise, market research, business processes, and more. Intangible assets now account for 85% of the market value of U.S. corporations, in contrast to 80% of market value in tangible assets 40 years ago ([Mayer, 2018](#)).

Technology and industrial know-how have also become focal points for national security and economic competitiveness, as evidenced by recent phenomena such as the US-China trade war and national security concerns over international supply chains for high-tech products.³

Moreover, although one would expect cross border investments with high technological intensity to be concentrated in the developed world, technology investment flows from developed countries to developing countries are in fact comparable to flows to developed countries. Figure 1 shows the foreign direct investment from developed OECD countries to peer countries and developing countries, respectively, for green-field research and development (R&D) projects in which MNCs create new operations on the ground. Foreign investment in R&D in developing countries, measured in million USD, is on par with and at times even higher than R&D investments in developed OECD countries.⁴ It is therefore imperative that we understand how technology and innovation are protected when invested across country borders, especially when invested into countries where domestic institutions for property protection are relatively weak and unreliable.

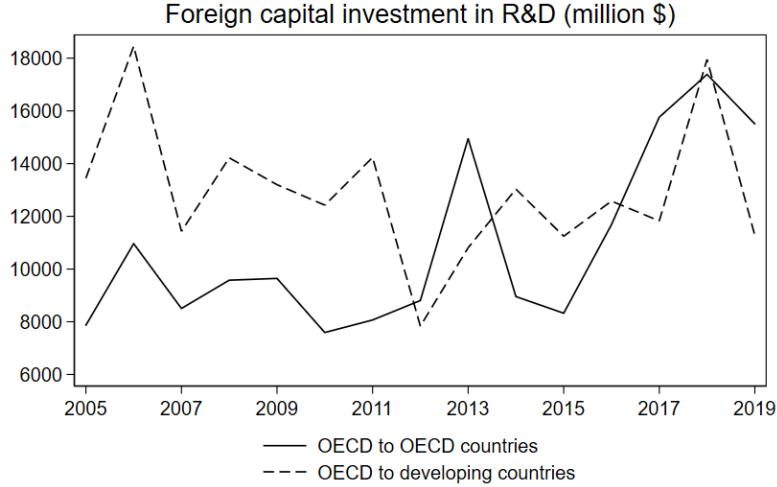
How then, do firms protect their technology investments in foreign jurisdictions if they are not able to rely on international forums? I argue that multinational corporations (MNCs) that enter into host countries with relatively weak governance institutions can influence how domestic institutions for property protection develop to achieve better protection through host country institutions. I further theorize that they do so through a two-level bargaining model that seeks changes to host country institutions at the home state-host state level and the firm-host state level. I assess the institutional effects of the two channels of institutional change, and argue that home government efforts to realize better IP protection at the behest of MNCs tend to be more effective at achieving de jure changes rather than de facto improvements.

Using home-host country pair data on measures of technological investment and an instrumental variable approach, I provide robust empirical evidence that there is a “closing the gap” phenomenon between levels of IP protection in the home and host

³Advancing innovation capabilities is also central to countries’ national development agendas. See for example the United States’ Innovation and Competition Act Bill (2021), Indonesia’s Master Plan of National Research 2017-2045, and Brazil’s Entrepreneurial Mobilization for Innovation (MEI) program (2008-present).

⁴South Korea, Colombia, and Turkey are OECD member countries but are generally categorized as developing countries. South Korea gave up its self-designated developing status in 2019. These three countries are excluded from calculations for purposes of Figure 1.

Figure 1: Greenfield FDI flows for research and development projects (2005-2019)



Notes: Capital investment flows (million usd) from 2005 to 2019 for greenfield foreign investment projects in research and development. Author calculations based on fDi Markets data.

country that can be attributed to foreign direct investment. A case study of General Electric in China at the nascent stage of China’s IP development illustrates the political strategies that MNCs use to engage directly with the host country government. Quantitative evidence from the United States Trade Representative’s (USTR) watch list on intellectual property practices in foreign countries shows that home country engagement at the behest of commercial interests can affect host country institutional development, but tends to be more effective in changing laws on the books rather than strengthening enforcement of laws.

This paper makes three primary contributions to the literature. First, it brings international investment into an account of studying how domestic institutions evolve, and provides new insights into how foreign direct investment can contribute to rule of law in developing countries. Past research has identified patterns between countries’ property rights and foreign direct investment in the direction of domestic political institutions affecting the flow of FDI (Li and Resnick, 2003; Jensen, 2003, 2006) or affecting the rate of expropriation (Li, 2009). I instead focus on how domestic investment protection institutions themselves evolve with the presence of foreign direct

investment within a host country’s jurisdiction.⁵

Secondly, my paper links firm-level strategies to institutional outcomes in host countries and advances our understanding of mechanisms through which MNCs protect their investment. Existing literature has found that firms can secure their property rights in rent-seeking economies such as Russia through alliances with stakeholders (Markus, 2015, 2012) including with foreign investors (Betz and Pond, 2019), local communities and labor, and domestic supply chain partners (Moran, 1973; Johns and Wellhausen, 2016). Home governments also act as a “shield” that offers protection through diplomatic channels and agreements with the host country (Wellhausen, 2015). As noted by Markus (2012, p.243), “constructive strategies of economic actors to address poor enforcement of property rights are critically undertheorized,” and my paper contributes to this critical discussion by identifying novel political strategies for property protection. I propose that MNCs have a two-tiered strategy where they both engage with host country governments directly and leverage home state strength when bargaining with the host country to seek better IP protection.

Thirdly, my paper makes a new cut at state-firm relations by focusing on intangible assets in firms. As early as 1991, Stopford, Strange, and Henley (1991, p.6) recognized that the “command of finance and technology” strengthens the transnational firm’s bargaining power against the host state. Even though technology know-how has long been recognized by political science scholars as a firm-specific asset that is valued by host countries (Jensen, 2003, 2006; Pandya, 2016), it has yet to be placed at the front and center of political science theories on firm asset expropriation and property rights (with the notable exception of Kobrin (1987)). My paper argues that firm ownership of technology know-how strengthens firm bargaining power over host states, and updates theories of firm-host country bargaining in light of firm ownership over intangible assets.

The rest of this paper proceeds as follows. Section 2 describes the limitations of international institutions in protecting technology and innovation, which underscores the importance of considering the role of domestic institutions in protecting foreign investment. Section 3 theorizes the strategic interaction between MNCs and host

⁵The realization that FDI affects host country development has also been prominent in dependency theory, which argues that multinational corporations entering into underdeveloped markets create economic distortions and impede local industrial development (Moran, 1978). In contrast, I find that FDI can provide momentum to domestic reforms in intellectual property rights that strengthen domestic rule of law.

countries with regards to technology protection, and argues that the nature of technology assets provides MNCs with bargaining power vis-à-vis host countries. Section 4 theorizes two mechanisms MNCs employ to realize change to domestic institutions in host countries. Section 5 provides a case study to illustrate the firm-to-host state mechanism, and section 6 introduces the research design and data for testing the hypotheses across a large number of home and host countries. Section 7 discusses the quantitative findings that support the hypotheses, and section 8 concludes.

2 Limitations to international institutions for IP protection

Technology assets are often protected in the form of intellectual property. This section establishes that external institutional options for foreign firms seeking intellectual property protection against host state expropriation are limited. For one, the regime for guaranteeing intellectual property protection in foreign direct investment is jurisdictionally fragmented and based on legal interpretations of each territory ([Liberti, 2010](#)), resulting in low utilization of international arbitration. For another, technology assets tend to encounter state expropriation that is indirect, which is difficult to address with international law and institutions.

The most comprehensive multilateral agreement on intellectual property is the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) signed in 1994 during the Uruguay round. It provides international harmonization of intellectual property protection but only to a minimum degree. As such, there have only been 42 cases launched in the WTO dispute system citing TRIPS terms, which is 7% of all WTO disputes. Post TRIPS bilateral free trade agreements have extended IP provisions beyond TRIPS in the so-called “TRIPS plus” agreements, but the lack of harmonization of extraterritorial standards makes it difficult to determine the highest international standards, and IP protection is mostly still territorial and relies on each country’s own definition of IP ([Farley, 2014](#)). Intellectual property is also protected under bilateral investment treaties (BITs) and other international investment agreements. These agreements often include investor-state dispute settlement (ISDS) mechanisms that allow investors to sue the host state in international arbitration courts. However, only six ISDS cases that relate to intellectual prop-

erty rights have been identified in the ICSID database and in the legal literature (Ducimetière, 2019), which is minimal compared to the volume of technological investments that flow across jurisdictions. Table 1 below summarizes disputes with regards to intellectual property protection practices in foreign countries that have appeared in international forums such as the World Trade Organization (WTO) and arbitration tribunals such as the International Center for Settlement of Investment Disputes of the World Bank (ICSID). Other international and regional organizations that manage intellectual property disputes, such as the World Intellectual Property Organization (WIPO) and the European Union’s Intellectual Property Office (EUIPO) have even less robust forums for dispute resolution. These two organizations are discussed in detail in the Appendix §1.

Table 1: Intellectual property disputes in international forums

| International Institutions | Number of IP cases | Percentage of total |
|----------------------------|--------------------|---------------------|
| WTO disputes | 42 | 7% |
| ICSID administered cases | 6 | 0.6% |

Notes: Sources: WTO dispute settlement gateway, Database of ICSID Cases, Ducimetière (2019). Investor-state dispute cases include: Shell v. Nicaragua (2006, trademarks), Eli Lilly v. Canada (2014, patents), Colt Industries Operating Corporation v. Korea (1984, licensing agreement), Philip Morris v. Uruguay, Philip Morris v. Australia, Bridgestone v. Panama. Most recent search conducted by author in October 2020.

There are several reasons as to why investors do not resort to ISDS for intellectual property protection as often as one would expect. First, bilateral investment treaties are more likely to complement rather than substitute for domestic institutions (Neumayer and Spess, 2005; Desbordes and Vicard, 2009; Tobin and Rose-Ackerman, 2010). Even when international arbitration rules in favor of foreign investors, the arbitration still needs to be enforced by local courts.⁶ Neither are all cases of expropriation worth expending firm resources on international arbitration. Furthermore, launching an ISDS dispute is financially costly and time consuming, and most importantly runs risks of souring relations with the host country and of inviting retaliation

⁶A case elaborated in (Wang, 2015, 56) illustrates that international arbitrations still rely on host country courts for enforcement. In 1994 GRD Minproc took a contract dispute with Shanghai Flying Wheel Company to the Arbitration Institute of the Stockholm Chamber of Commerce, which ruled in favor of GRD. Flying Wheel then appealed the decision in China’s domestic courts. The case ultimately went to the Shanghai’s Higher People’s Court, which upheld and enforced the Stockholm Arbitration institute’s decision.

by the host government. In contrast, using government institutions such as embassies softens the perception that the firm is directly challenging host country practices.⁷ In fact, the US Trade Representative advises that international investment arbitration is a “recourse of last resort” for firms that have encountered expropriation abroad.⁸

Perhaps most importantly, the efficacy of international institutions for intellectual property protection is low. Expropriation of intellectual property by host countries is often indirect, which falls short of a transfer of ownership that defines direct expropriation.⁹ Cases of indirect expropriation tend to have low rates of litigation success in investor-state disputes (Pelc, 2017). For example, Philip Morris’ cases against Uruguay and Australia based on claims of intellectual property violations both failed to gain favorable rulings in international arbitration.¹⁰ Expropriation of IP typically occurs through technology theft, forced technology transfer, and bureaucratic obstruction. In terms of technology theft, the host government may use cyber capacities to hack company systems, or obtain technology secrets from personnel who work in the company. Forced technology transfer includes a range of policies such as technology for market access requirements,¹¹ other foreign investment catalogue restrictions, or local content requirements.¹² Bureaucratic obstruction occurs where the state uses legal and regulatory tools at its disposal to discriminate against foreign businesses. One example is Brazil’s 1996 industrial property law stipulated that drug patents needed to fulfill a “local working” requirement to be patented in Brazil. Companies can also be required to disclose trade secrets in order to obtain regulatory approvals (Prud’homme and von Zedtwitz, 2019). Unlike government takeovers or

⁷For example, General Electric sought assistance from the US government to help settle its dispute with Trinidad & Tobago in order to avoid an arbitration claim (Cable ID: 06PORTOFSPAIN374) (Gertz, 2018).

⁸“Fact Sheet: Investor-State Dispute Settlement.” Office of the United States Trade Representative, March 2015. Cited in Wellhausen (2019).

⁹Recent studies have found that states are increasingly engaged in indirect expropriation (UNCTAD, 2000; Graham, Johnston, and Kingsley, 2017; Pelc, 2017).

¹⁰Philip Morris argued that to comply with Uruguay’s new tobacco control laws it had to withdraw seven of its thirteen trademarks from the Uruguayan market (Gabriel and Mesquita, 2018). In *Philip Morris vs. Australia*, Philip Morris claimed that Australia’s 2011 Tobacco Plain Packaging Act deprived the company of the value of its trademark on tobacco packaging.

¹¹A common example of technology for market access is joint ventures, where foreign investors are required to set up joint ventures with domestic companies and share technology and manufacturing processes. While joint ventures by themselves do not amount to expropriation, they increase the foreign counterpart’s risk of being expropriated by the state (Henisz, 2000).

¹²For example, Indonesia’s 2016 patent law instituted a working requirement that allowed transfer of patented technologies and processes to third parties under certain conditions.

forced liquidation, all these forms of expropriation are indirect expropriation that is more difficult to challenge in international arbitration.

3 MNC bargaining for technology protection in host countries

Providers and adopters of technology have different preferences for the degree of access to technology. Providers seek to safeguard their technology while profiting from selling it to others, and adopters seek to absorb technology as quickly as possible and catch up. For consumers of new ideas, either firms or countries, there is always incentive to free-ride on existent technology instead of investing in costly research and development that has uncertain returns. This section theorizes on the strategic interaction between MNCs and host countries with regards to protecting foreign technology.

I argue that multinational firms are strategic actors in the host country market and have a range of resources at their disposal to shape domestic institutional conditions to their favor. Scholars in business management describe the actions that firms take to proactively change institutional conditions for their businesses as “institutional entrepreneurship” (Greenwood and Suddaby, 2006; Garud, Hardy, and Maguire, 2007), which they define to be “activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” (Maguire, Hardy, and Lawrence, 2004, p.657). Corporations, in particular large firms (Bombardini, 2008), engage intensively in lobbying their governments for favorable policies or policies that they are better adjusted to than their competitors (de Figueiredo and Richter, 2014; Kennard, 2020; Perlman, 2020). Moreover, foreign firms are more susceptible to discriminatory treatment and likely to encounter higher regulatory barriers than domestic firms when investing abroad. The “liability of foreignness” that foreign businesses need to overcome is two-fold.¹³ Foreign firms enter into institutional environments that are different from that of their home countries, and have an ownership disadvantage when operating in foreign markets due to their lack of local ties and local knowledge (Elango and

¹³Zaheer (1995) first proposed the term “liability of foreignness” to describe differences in organizational practices of foreign and indigenous firms, and scholars later adapted this term towards political risks that foreign firms face in host countries.

[Sambharya, 2004](#)). They also face additional political hazards “due to the differential access to the political process that arises by reason of nationality” ([Elango and Sambharya, 2004](#), p.267).

In addition, foreign firms can be at a competitive disadvantage as compared to domestic firms in host countries due to the different sets of business standards and legal requirements that they have to meet. In using strategies to seek changes to domestic institutions and regulations, MNCs can “close the gap” between government policies and practices in their countries of origin and the countries that they are investing in to mitigate competitive disadvantages based on ownership, nationality, and higher standards of business conduct. Such is the “level the playing field” objective that European and American businesses and their business associations often pursue abroad. Along the same lines, [Garcia-Johnson \(2000\)](#) argues that American chemical conglomerates’ push for more stringent environmental standards in India and Brazil because they have already adapted to higher environmental standards.

Technology assets afford multinational firms a degree of bargaining power that can be leveraged when bargaining with the host state. This bargaining power is derived from the mobility and rate of upgrading of technology assets. Intangible assets are a class of firm specific assets that are not tied to a specific geographical location in the way that plant infrastructure and machinery are ([Rugman and Verbeke, 2009](#)). In contrast to fixed assets, firms can be more selective about the types of intangible assets that they move into investment locations. They also incur less sunk cost in events where they need to scale back or withdraw from foreign markets. Technology assets are also constantly upgraded in dynamic industries such as information and communications technology ([Kobrin, 1987](#)), and it is impossible for domestic firms in host countries to keep up by simply free-riding off of technology that MNCs provide. Relatedly, such assets are more difficult for host governments to expropriate because they lack the human resources and technological capacity to operate these assets. In 1971 the Allende government in Chile nationalized the majority of U.S. subsidiaries in the manufacturing industry, but the Chilean subsidiary to the cosmetics company Revlon was left unscathed because the government did not have the technological capacity to continue production after nationalizing the subsidiary ([Bradley, 1977](#)). Firms with more “intense and dynamic” technology ([Kobrin, 1987](#), p.613) are therefore less likely to be subject to the logic of the obsolescing bargain ([Vernon, 1971](#)), where the firm loses bargaining power and faces mounting risks of direct expropriation

by the host state after substantial investment in fixed assets.

Host governments may choose to respond to MNC efforts to protect their technology because technological assets are attractive to governments to retain in their jurisdiction. Nations lagging behind technology front-runners often take advantage of foreign technology to build industrial capacity, and adopt policies to encourage FDI into technology-intensive sectors (Kowalski, Rabaioli, and Vallejo, 2017). By allowing IP intensive firms to operate without disruption for a longer period of time, the host country is likely to benefit from new technology introduced by the firm over the longer term. However, the domestic economy would absorb the technology at a slower pace while the MNC gains market share either through exporting its products or selling them in the domestic market, and the host country would risk missing the window of opportunity to grow indigenous industrial capacity.

On the other hand, by expropriating over the shorter term, the host country will gain access to the technology and absorb it into its domestic economy faster. However, by breaching implicit or explicit terms of entry that were agreed upon with the MNC and increasing the firm’s perceptions of expropriation risks, the host government risks deterring the firm from making investments in the future that contain more sophisticated technology. Further, it will damage its reputation as a foreign investment destination for other potential foreign investors.

The host government’s choice in this trade-off hinges on the benefits to the wider economy of expropriating technology from a firm in the short term versus the benefits from absorbing technology from a firm over the longer term. This calculation is unclear *ex ante*, but the host government can adjust its judgment based on the behaviors of the multinational firm in the local economy. The aforementioned firm strategies enable states to discern firm intent on being embedded in the market for the long term, especially with regards to its intents of investing in technology. On the firm side then, there are strategies they can adopt to signal to the host government the type of economic actor that the firm will be to the domestic economy. These strategies will be introduced in the next section.

Overall then, MNCs entering into host countries with relatively weak governance institutions are able to deploy strategies to seek better intellectual property protection through host country institutions. In doing so, they are “closing the gap” between institutional outcomes in their countries of origin, and the countries that they are investing in.

Firms with high value in intangible assets are likely to prefer higher standards of intellectual property protection in any country that they invest in. However, firms investing into countries that already have better IP protection than their home country are less motivated to actively seek better protection since their home governments are less likely to provide political backing and legal justifications for their demands. Firms in this category are also less likely to offer technology that is more advanced than those possessed by domestic firms in the host country. Therefore, while theoretically I expect IP protection to be a common interest for firms that invest their technology abroad, the “closing the gap” effect is what I expect to observe empirically. The scope of H1 thus excludes foreign direct investment from countries with weaker institutional settings to countries with stronger institutional settings. My first hypothesis is therefore:

H1: Host country institutions for intellectual property protection improve with increasing investment from a home country, where the home country has higher institutional quality than the host country.

4 FDI’s effect on host country property protection

Next, I theorize on the mechanisms through which the “closing the gap” effect hypothesized in H1 is realized. I argue that MNCs engage in “two-level bargaining” when seeking to protect their assets through host country institutions. This theory draws from [Putnam’s \(1988\)](#) “two-level games” and [Ramamurti’s \(2001\)](#) “two-tier bargaining” models, but focuses on how private actors employ two channels of political strategies to change institutional conditions in the host country. At the state-to-state level, MNCs draw on the strength of their ties to the home government. The home government then uses its trade and investment related leverage to pressure host governments into meeting MNC demands for property rights protection.¹⁴ At the firm to state level, firms can deploy strategies to strengthen their claims as local firms embedded in the host economy, and achieve better property protection outcomes through host country institutions. These strategies are significant because

¹⁴Home state engagement is motivated by MNC preferences expressed to the home state. [Brutger \(n.d.\)](#) offers a detailed analysis on how private firms have signal the value of cases to countries for WTO dispute initiation through providing information and bureaucratic subsidies. [Li \(2020\)](#) provides direct evidence that home country actions in foreign intellectual property regulations is informed by its corporate interests.

they result in changes to the rules governing property protection in the host countries where MNCs operate. I develop the logic of these two mechanisms further in the next subsections.

Leveraging home country institutions for property protection

While modern trade and state protection of foreign direct investment has evolved past “gunboat diplomacy” in the 19th and early 20th century where states directly resorted to force to guard their commercial interests, political actions by a state on behalf of commercial interests of its businesses are widespread.¹⁵ MNCs consciously draw on the political power of their home states in order to achieve change to regulatory practices in foreign countries. In such a way, MNCs are able to avoid direct conflict with host governments while conveying their demands for property protection to host governments through their home governments. These political actions range from diplomatic lobbying to direct threats that leverage economic dependencies. For example, the British government was actively involved in lobbying for its electric company Rurelec, even while the company was engaged in an investor-state dispute with Bolivia. In a disclosed email, the UK ambassador to Bolivia noted that “Our regular high-level lobbying on behalf of Rurelec has helped to demonstrate the seriousness with which we take protection of our companies’ interests.”¹⁶ Similarly, despite having a BIT with Argentina, Spain threatened swift economic retaliation following Argentina’s 2012 decision to take over assets of Spanish energy group Repsol.¹⁷

More systematic programs to use state power for business interests are also at play. In terms of intellectual property rights, the United States Trade Representative (USTR) conducts an annual review of countries’ intellectual property (IP) practices and ranks countries on its Special 301 watch list according to the severity of their violations of US IP interests. This watch list does not automatically prompt trade sanctions, but the top category of “priority foreign country” sets the pathway towards WTO disputes or Section 301 trade investigations that countries are keen to avoid.¹⁸

¹⁵As [Casler and Gaikwad \(2020\)](#) show in the case of trade policymaking in British India, businesses were already lobbying their home government to protect their interests abroad in the early 20th century.

¹⁶Quoted in “The obscure legal system that lets corporations sue countries.” Claire Provost and Matt Kennard. *The Guardian*. June 10, 2015.

¹⁷Tracy Rucinski and Julien Toyer. “Incensed Spain threatens Argentina after YPF seizure.” *Reuters*. April 17, 2012.

¹⁸See [Shadlen, Schrank, and Kurtz \(2005\)](#) for institutional details on how the watch list builds

Sell (1998, 189) documents 8 cases of the USTR using Section 301 threats of trade sanction to pressure changes to intellectual property law practices in other countries. For example, Chile’s legislation on pharmaceutical patent protection in the 1990s was a direct result of the Pharmaceutical Manufacturers of America’s (PMA) Section 301 petition against Chile, which was only withdrawn after the Chilean government promised to change its laws.¹⁹

Following the US’ lead, the European Commission (DG Trade) issued the “Strategy for the enforcement of intellectual property rights (IPR) in third countries” in 2004 and started publishing its list of intellectual property (IP) priority countries in 2006. Japan’s Ministry of Economy, Trade and Industry (METI) also implements a national IP strategy that includes a petition system designed to address IP violations experienced by its companies when operating abroad.²⁰ These processes mainly rely on industries for information as to which countries to target. In its “Evaluation of the Intellectual Property Rights Enforcement Strategy in Third Countries” (2010) report the European Commission explicitly notes that “[v]arious actors such as Commission staff members, industry representatives and consumer organizations shared the view that the strategy was mainly based on industry demands, sometimes with direct input” (quoted in Krizic and Serrano (2017)).

There are however limitations to the efficacy of home country efforts for regulatory change in other countries. Home country demands, especially those that are made publicly, are unlikely to be received favorably by the host countries. Such demands are perceived as illegitimate, and could lead to reputational loss for the host country if it chooses to comply (Pelc, 2010). Domestic interest groups that oppose IP legislation can also sway host governments and weaken their commitments to IPR reform. Powerful lobbying coalitions of piracy groups that oppose more stringent copyright law have, for example, been able to impede IPR legislative processes in Thailand, Argentina, and the like (Sell, 1995). In cases where the home state has sufficient

towards trade sanctions.

¹⁹One caveat is that the public comment submissions in the USTR Special 301 process are not submitted by individual firms but by business associations. Another working paper of mine looks in detail at the process (Li, 2020).

²⁰Japan’s Petition System Related to Intellectual Property Rights Violations Abroad is unambiguously based on feedback from its private companies. According to the Overview of the 2017 Annual Report published by METI, under this system, “upon receiving a request for investigation into an infringement filed by companies and other entities, Japan starts an investigation into target infringement, through examination of legal systems and other programs in the originating countries of infringements and consultations with the governments of the countries.”

leverage over the host state, mostly manifested in the form of trade interests that are dependent on home country commitments, the host country is more likely to concede to legislative change to appease the home country and to ease pressure from home country targeting (Sell, 1995). However, once it fends off the unilateral pressure, the law is less likely to be implemented and enforced down the line. Especially in countries with weak judicial institutions and low capacity for law enforcement, improving enforcement of laws requires prolonged engagement that is not realized simply by unilateral demands (Allison and Lin, 1999).

I therefore argue that home country engagement such as through the Special 301 watch list is effective in changing host country institutions, but only to a limited degree. The fact that countries sign on to agreements but do not necessarily implement them has been recognized not only in intellectual property rights (Sell, 1995; Shadlen, Schrank, and Kurtz, 2005; Jandhyala, 2015) but also in areas such as international monetary law (Simmons, 2000) and human rights (Hafner-Burton and Tsutsui, 2005). Past studies by Noland (1997) and Shadlen, Schrank, and Kurtz (2005) have also reached similar conclusions on USTR's inability to pressure foreign governments into complying with desired enforcement of IPR laws and regulations. I instead provide a more comprehensive and nuanced assessment of the effectiveness of home country engagement with foreign countries' IPR policies along the dimensions of de jure and de facto protection. I expect countries to change their laws in an effort to respond to home government demands, but to do so only to avoid economic repercussions, thus falling short of enforcement of the new rules. My hypothesis with regards to the home government channel is thus:

H2: Engagement by the home country in terms of changing IP practices in host countries results in improvement of de jure protection of intellectual property, but less improvement in de facto enforcement.

The host country channel for property protection

Following Hirschman's (1970) framework, to seek better intellectual property protection within host country institutions, foreign firms can amplify their voices within the host country (voice), or engage in investments and partnerships on goals that the host country values (loyalty), or as a measure of last resort, threaten to divest from the country or from localities (exit).

“Loyalty” categorizes firm strategies that further participation in the host economy according to the terms set by the host government. One main strategy to do so is through using investments to send political signals to the host country. The firm could bring in certain investments that are aligned with government development priorities: by doing so it is not only making a market investment but also a political investment that accrues goodwill and reputational benefits in the host country, and converts to better treatment by the host government, including by its regulatory and judicial bodies (Chen and Xu, 2020). Besides business investments, other investments to consider include corporate social responsibility (CSR) (Knauer, 1994; Kerner and Sumner, 2019), donation to charities, political donations, and even bribery of government officials.²¹ This method of influencing institutional outcomes is not restricted to countries with underdeveloped institutions. Samsung, for example, built an ice rink and funded scholarship programs in local schools in the small town of Marshall, Texas, to build goodwill in the local community that will serve as jury in its patent cases in the Eastern District of Texas court.²²

“Voice” categorizes firm strategies that express policy preferences with the goal of influencing policy. This is predominantly realized through lobbying. Foreign firms could provide comments to draft legislation, hold meetings with government agencies and officials, and have opportunities to voice specific concerns directly to the government. Persistent lobbying with regards to intellectual property regulation occurs, such as with foreign companies in Russia that have lobbied the Russia government to “align its intellectual property laws with those of Western countries” (EIU, 2012). Firms also delegate industry and trade associations that are located within host countries to lobby the host government, especially for smaller firms with less direct political access. Such organizations adopt cooperative stances with the host government to “influence policy in a cooperative and incremental fashion” (Kennedy, 2005, p.139).

Lastly, “exit” as a strategy for property protection is a strategy of last resort that is more costly and difficult to implement than loyalty and voice. To exit a host country market, the firm has to divest some or all its physical assets in the host country and forgo market share in the country. Ford for example is recording \$4.1 billion in charges from ending vehicle operations in Brazil,²³ and the Arkansas

²¹For further consideration of bribery and corruption, see Markus (2012).

²²“Why a small town in Texas had Samsung’s ear.” <https://www.bbc.com/news/world-us-canada-40021491>

²³Michael Wayland. “Ford to end manufacturing in Brazil, sees \$4.1 billion in charges from South

toymaker Redman & Associates experienced severe disruption in their supplies from China when attempting to reshore to the US from China in 2014.²⁴ Even though the *threat* of exit can plausibly be effective as a bargaining chip when firms seek better property protection within the host economy, this strategy has yet to be practiced extensively by businesses.

5 Private actors as institutional pioneers

In this section I illustrate how foreign firms could influence the development of intellectual property institutions in host countries through “loyalty” and “voice” with a case study of General Electric’s (GE) investment in China from 2000 to 2005. To test my argument about how strategies employed by multinational corporations in host countries lead to institutional changes, I conduct semi-structured interviews with business executives of General Electric China during this period, and corroborate their accounts with additional interviews and secondary sources. This case study also largely avoids the problem of endogeneity between institutional conditions and foreign direct investment since China’s legal environment for intellectual property protection did not start to take shape until the 2000s.

Despite China’s current status as an economic powerhouse, it only started allowing foreign direct investment in the 1990s. As Figure 2 shows, FDI inflows into China were relatively small in the 1990s to early 2000s period. China also only started to build its intellectual property apparatus in the early 2000s to meet conditions for entry into the WTO. Market potential rather than institutional quality then is the primary reason that drew foreign companies to the Chinese market (Li et al., 2000). As affirmed by my interviewees, the decision to enter China was driven not by institutional factors in the Chinese market but by business opportunities. For GE China’s market was a “perfect fit”, and it wanted to “catch the wave” of the China market in the new century.²⁵ China in the same period was aware of the crucial role of foreign research and development investments for the country’s technological and economic development, as manifested in its Tenth Five-Year plan (2001-2005): “The ability

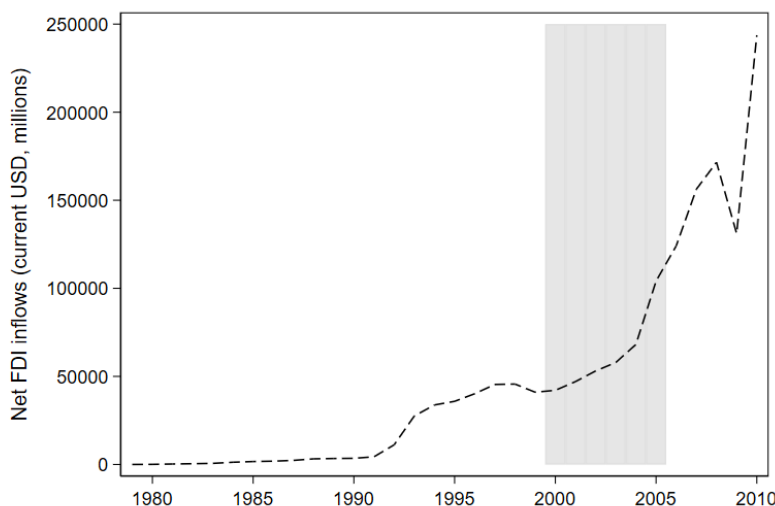
American restructuring.” January 11, 2021. *CNBC*.

²⁴James B. Kelleher. “Jilted Chinese supplier tells would-be U.S. reshorer - ‘Not so fast’.” October 31, 2014. *Reuters*.

²⁵Cited from Interview GE1 and Interview GE2 conducted by author with high-level business executives that worked at GE China in the early 2000s.

to make independent technological innovations must be improved in the high-tech sectors which are linked to national economic lifelines and State security... Foreign companies should be encouraged to open research and development institutions in China ...”²⁶

Figure 2: FDI inflows into China (1979-2010)



Notes: Foreign direct investment net inflows to China from 1979 to 2010 (BoP, current USD, millions). The shaded zone marks the time span of the GE case study (2000-2005). Data source: World Bank.

GE China’s Global Research Center that opened in Shanghai in 2003 was therefore a significant investment decision that also served as political investment in “loyalty.” GE was one of the first foreign firms to establish a research and development center in China, and the center not only housed research and development activity but also served to signal to the Chinese government GE’s interests in investing in technological development in China for the long term. According to then GE CEO Steve Schneider, the R&D center was established to meet China’s specific demands for biomaterials, ceramic magnets, and crystals that called for product development and fundamental research in the China market (Fernandez and Underwood, 2006, p.192). Since its establishment, the center has been a “poster child” that Chinese officials would visit and uphold as the “gold standard” in terms of foreign R&D centers in China (Interview GE1). In Shanghai it was considered the “flagship” example of foreign

²⁶ “Premier Zhu Rongji’s Explanation of 10th Five-Year Plan Drafting.” Source: <http://www.china.org.cn/e-15/15-3-g/15-3-g-1.htm>. Accessed June 28, 2021.

R&D investment for the last 10-15 years (Interview GE2). GE is also no exception in locating research and development to China early on. Microsoft established a global research lab in Beijing in 1998 that it touted as “one of the best computer science laboratories in the world” (Fernandez and Underwood, 2006, p.190).

In 2000 there was no concept of intellectual property (IP) in the legal environment in China. As affirmed by my interviewees, IP laws were being drafted and enacted, but awareness of the laws had not been developed. GE was able to exercise strategies of “voice” and engage extensively with the Chinese government to express its policy preferences for intellectual property protection and contribute to institutional building in China. GE actively participated in drafting and revising relevant laws in China, and had access to the central government and to key government officials who were making the laws. Managers of GE China visited law-making agencies in person, including the senior lawyer of GE, who was well connected to the Chinese government and held access to the Legislative Affairs Office within the State Council as well as to leaders of the domestic court system in different provinces. GE also gave input on policies through closed door meetings held by the government to solicit feedback on draft laws. Not only did the government rely on GE for input into IP legislation, but the company also played a role in capacity building for the legal system. In 2002/2003 GE brought back a Chinese IP lawyer to China who built up a team of lawyers specialized in Chinese IP law. In the years from 2003 to 2010 when China was establishing a court system for governing intellectual property rights, GE regularly offered training to local judicial personnel.²⁷

GE’s senior intellectual property counsel for the Asia Pacific, who was based in China, also held the position of chairman of the American Chamber of Commerce Shanghai’s IP subcommittee for a few years. This role allowed GE to conduct horizontal communication with other US firms in the industry, and to enhance its voice as representing a collective preference on behalf of the industry. In this capacity, GE China actively spearheaded and authored white papers on various policies. Later on, GE also joined the Quality Brands Protection Committee (QBPC), a key industrial organization that protected foreign intellectual property in China, in order to better coordinate policy preferences and lobbying.²⁸

²⁷The information in this paragraph is obtained through Interview GE1 and GE2.

²⁸Information obtained through Interview GE1 and GE2, and corroborated by interview with former American Chamber of Commerce Shanghai official.

GE’s experience demonstrates how foreign firms, through the strategies of “loyalty” and “voice,” can influence how intellectual property protection policies and relevant institutions develop in host countries.²⁹ I next use cross-country data analysis to show that the empirical expectations proposed by H1 and H2 apply to a wide range of home and host countries.

6 Data and research design

Panel data analysis

I construct a panel dataset on home-host dyads to test the effect of technology investment from multinational corporations on host country institutions for intellectual property protection (H1). The dependent variable for measuring the level of intellectual property protection in countries is based on the International Property Rights Index (IPRI) produced by the nonprofit organization Property Rights Alliance. The index is provided from 2007 to 2019, and is a conglomeration of widely used indicators including de facto and de jure indicators of property protection in countries, with intellectual property rights as a core component. About 120 countries are rated each year, with slight fluctuation each year in sub-index data availability.³⁰ The main independent variable measures greenfield investment in research and development (R&D) from a given home country to a host country. The data is obtained from fDi Markets, a specialized dataset produced by the Financial Times that is the most comprehensive online database of crossborder greenfield investments available ([Financial Times, 2021](#)).

The dependent variable is constructed to be the institutional distance in terms of IP between home country j and host country i in a given year t , $IPRI_{j,t} - IPRI_{i,t}$. The empirical expectation based on H1 is that as R&D investment from home country j to host country i increases, the distance between the two countries’ IP institutions narrows. Based on my theory, it is important to take into account home and host country characteristics. I therefore adopt a fixed effects model at the home-host

²⁹As discussed in the earlier sections of this paper, the effectiveness of these strategies for each foreign firm will depend in large on the firm’s edge in technology and in the degree to which host countries desire the particular technology.

³⁰There is sufficient variation in the level of intellectual property protection for countries year on year. The index itself ranges from 2.2 to 8.7, and the average increase each year for countries is 0.86, with a standard deviation of 0.67.

country dyad level from 2007 to 2019 and control for year fixed effects and dyad fixed effects. Year fixed effects account for yearly shocks across all home-host country pairs, and dyad fixed effects control for all time constant factors between a given home and host country pair that might influence their institutional distance, such as cultural distance, differences in legal traditions, and diplomatic relations to the extent that they are stable in the 2007 to 2019 period of the sample. The dyad fixed effects also ensures that home country and host country year invariant fixed characteristics are accounted for in the analysis.

In addition to a fixed effects model using the dependent variable and independent variable discussed above, I adopt an instrumental variable approach to address the issue of endogeneity between foreign direct investment and domestic institutions. I construct a shift-share instrument to predict FDI inflows in research and development from home country j to host country i for each year in the sample. The aim is to combine variation in shifts on the aggregate level of FDI inflows and in shares of FDI inflows received by each country to produce an instrumental variable that is exogenous to the quality of host countries' IP institution in the time range of my data sample (2007 to 2019). More specifically the “shift” is the exogenous component in the design, meaning that the total flow of research and development investment out of a given home country is plausibly exogenous to the IP protection conditions in any single host country that it is going to.³¹ Following studies that predict migration flows to localities using annual total migration flows and local migration shares in years prior to sample years (Saiz, 2007; Calderón, Fouka, and Tabellini, 2021), the shift-share instrument is constructed as follows:

$$Tech\hat{FDI}_{i,j,t} = \phi_{i,j,2005,06,07} \times TechFDI_{j,t}$$

The shift variable $TechFDI_{j,t}$ is total greenfield investment invested in research and development that originates from home country j each year. The share variable $\phi_{i,j,2005,06,07}$ is the share of R&D investment that flowed from a given home country j to each host country i over three years, 2005, 2006, and 2007. Aggregating over 3 years of investment flows for the share variable smooths out the yearly idiosyncrasies in R&D investment for each home-host country pair and creates a share variable that

³¹Calderón, Fouka, and Tabellini (2021, p.107) have a similar discussion regarding migration flows from the American south to northern counties.

better predicts FDI shares of a given host country in later years.³²

To satisfy the exclusion restriction, the shift-share interaction has to be exogenous conditional on the baseline controls. The baseline specification of estimation therefore includes factors that are correlated with the instrument and can influence intellectual property institutions (the dependent variable) through other channels. First, host countries can commit to IP reform through trade agreements and investment provisions, which would attract more inward research and development investment, as well as lead to IP reform. I therefore control for whether or not a host country is compliant with the WTO TRIPS agreement, as well as the number of preferential trade agreements between the host and home country that include intellectual property provisions. I collect data on the precise year when a country publishes its review of legislation on intellectual property to the Council for TRIPS as the year when a country commits to TRIPS.³³ The data on the number of bilateral or multilateral trade agreements signed between each country dyad comes from the Design of Trade Agreements (DESTA) database (Morin and Surbeck, 2019). Trade linkages are likely to spur investment as well, and may motivate private actors to comply with higher standards of IP (Malesky and Mosley, 2018; Distelhorst and Locke, 2018), as well as provide pressure to the host government to meet demands of countries that it is dependent on for exports. I construct a measure of trade dependency as a country's export of goods to the home country as a share of its GDP, with export data from UNCTAD. Lastly, the economic size and income level of the host country are strongly related to the amount of technology intensive foreign investment it attracts, and has been shown to be strong determinants of IP protection levels (Maskus and Penubarti, 1995; Ginarte and Park, 1997; Maskus, 2000). I use GDP and GDP per capita data from the World Bank's Worldwide Governance Indicators.

Evaluating institutional outcomes

To test my hypothesis on the effect of home country engagement on host country IP institutions (H2), I collect data on one of the most notable channels of home country

³²Using FDI flow data from the years 2005, 2006, and 2007 also ensures that the share variable is not directly affected by host country intellectual property protection levels in later years.

³³Article 63 of the TRIPS agreement lays out the terms for transparency and disclosure. TRIPS was signed by WTO member countries in 1995, however certain countries were given grace periods to revise their systems to become fully compliant with TRIPS, leading to variation in the commitment dates of countries to TRIPS.

power on host country IP practices, the USTR’s annual Special 301 review. The sample includes host countries that have been targeted by the USTR on its watch list at least once since the US initiated its annual review of intellectual property protection practices in foreign countries in 1989. This includes not only countries that have poor IP practices in common perception, but also advanced economies such as Canada, Australia, Germany, and Japan. The excluded countries are in large part least developed countries and island states that are not relevant to US interests in intellectual property protection, such as Afghanistan, Bangladesh, and Curaçao.³⁴ Country-year engagement is coded as a dummy variable, with 1 indicating a country being on the USTR watch list in a given year. For these countries, I also include a supplemental measure of home country engagement in the form of the number of trade and investment agreements between the US and a given host country that include intellectual property provisions. This captures negotiations between the US and a given country that also reflects MNC interests in more stringent IP standards. Due to the fact that the USTR threat of trade sanctions is no longer legitimate under WTO rules after countries have complied with TRIPS terms, I include an interaction term of USTR targeting and TRIPS compliance to account for the different levels of effectiveness of USTR targeting before and after a country complying with TRIPS. Overall, the empirical expectation of H2 is that the two measures of US engagement would be positively correlated with the de jure measure of IP institutions, but not the de facto measure.

Gold, Morin, and Shadeed (2017) and Morin and Gold (2014) provide a de jure IP index that measures the adoption of IP rules that are specific to US demands for increased IP protection. The index consists of 9 criteria and ranges from 0 to 9, with higher values indicating higher alignment of a country’s IP rules with that of the US, such as granting patentability to plants varieties (Morin and Gold, 2014, Appendix B). The 9 indicators are further listed in the Appendix §5. To my knowledge, Gold and Morin’s IP index includes the most accurate measurement of the degree to which host countries’ IP laws are aligned with US standards for IP. 58 developing countries from the years 1995 to 2011 are included in their data.

To complement this analysis and test the hypothesis for a longer time period, I collect an original set of data on de jure IP laws using the laws published on the

³⁴The only exceptions are United Kingdom and Belgium, which have also never been included on the watch list.

World Intellectual Property Organization’s WIPOLex portal.³⁵ From each country’s legal repository in WIPOLex, I collect information on the year when main IP laws are enacted or amended by the legislature in a given country. This then forms a dummy variable where the years a country has legislative changes to IP laws is recorded as 1. Appendix §6 provides more details on this measure.

The measure for IP enforcement levels in countries comes from the Executive Opinion Survey published in the World Competitiveness Yearbook. Conducted by the Institute for Management Development (IMD) based in Switzerland, the survey has been fielded each year since 1995 among 60 countries to produce a competitiveness ranking. Business executives are asked to respond to the statement “Intellectual property rights are adequately enforced” in the country they are rating and to rate the degree to which they agree with the statement on a scale of 1 to 10.

In addition to control variables described in the previous section, for H2, I also account for the strength of domestic interest group support for IP reform by controlling for the number of patents filed by residents of a country to the United States Patent and Trademark Office (USPTO) per 100,000 of a country’s population. This measure is exogenous to the host state’s IP institutions since the patents are being approved by the US patent application system. The more patent applications there are from a given country, the more domestic industries from that country tend to have innovative capacity and support intellectual property reform in their own country (Jandhyala, 2015).³⁶ Other foreign policy factors may also influence the US’s decisions on whether or not to target a certain country on its USTR watch list, or the degree to which to negotiate for concessions on IP for trade and investment agreements. Countries with more affinity to the US may be treated more favorably. I account for this possibility by controlling for regime type using the “polity2” variable in the Polity data that represents regime types on a scale of -10 to 10, as well as for whether a country has a military alliance with the US by using data on alliances provided by The Alliance Treaty Obligations and Provisions (ATOP) project. The degree of leverage that the United States government has to seek demands with foreign countries on the issue of IP is measured by trade dependency, whether a country is a generalized system of preferences (GSP) recipient of the US, and the amount of foreign aid a country receives from the US.³⁷ Lastly, I account for possible diffusion effects of legal reform

³⁵See more at the WIPOLex portal: <https://wipolex.wipo.int/en/members>

³⁶This data is available through the World Intellectual Property Organization (WIPO).

³⁷The GSP data is drawn from Hafner-Burton, Mosley, and Galantucci’s (2018) compilation for

by controlling for whether neighboring countries of a given host country had passed legal changes to IP law in the previous year as recorded in WIPOLex.

7 Empirical findings

Closing the institutional gap

Table 2 shows the main results from testing H1. The OLS models (1) and (2) use the measure of greenfield research and development investment from home country j to host country i each year as the independent variable, while 2SLS models (3) and (4) use the shift-share instrument as the main independent variable. Models (2) and (4) include the set of control variables described in the previous section. The home countries and host countries that are included in the sample are displayed in Appendix §2 Table A.1 and Table A.2. Results in model (4) show that a one-standard-deviation (219.67 million USD) increase in R&D inflows leads to a 0.022 unit decrease ($= -0.0001 \times 219.67$) in the institutional gap between home country and host country IP institutions. Using host country change in intellectual property institutions as an alternative dependent variable, Appendix §3 Table A.3 shows similar fixed effects regression results that support the hypothesis. 0.022 is a plausibly small movement for the dependent variable, since this effect represents the average effect of a single home country’s technology FDI on a host country’s IP institutions. The average institutional distance in the sample is 2.38 and the standard deviation is 1.06,³⁸ and for a host country receiving foreign direct investment in technology from a multitude of home countries, the average aggregate effect on its institutions will be larger and more substantial.

For the first stage regression of the two-stage least squares (2SLS) estimation, underidentification is rejected by the SW chi-squared Wald statistic ($p = 0.02$). Table 3 displays the first stage results that tests for the strength of the shift-share instrument as a predictor of the endogenous independent variable. The Kleibergen-Paap Wald rk F statistic for the first stage is 21.46, which safely rejects that the instrument is

the years 1989 to 2013, and then collected from Congressional Research Service reports for the years 2014 to 2019. The foreign aid data comes from USAID’s record of project level foreign aid expenditures for each fiscal year. Projects from October onwards in the current calendar year are counted towards the next calendar year.

³⁸The median institutional distance in the sample is 2.54.

Table 2: Closing the institutional gap through tech FDI

| | (1) IP distance OLS | (2) IP distance OLS | (3) IP distance 2SLS | (4) IP distance 2SLS |
|-----------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| R&D FDI | -0.0001* (0.0000) | -0.0001*** (0.0000) | -0.0001** (0.0001) | -0.0001** (0.0001) |
| Number of PTAs | | 0.1293* (0.0621) | | 0.1345** (0.0607) |
| TRIPS Compliant | | 0.0351 (0.1549) | | 0.0363 (0.1684) |
| Trade Dependency | | 0.0111 (0.0584) | | 0.0244 (0.0616) |
| GDP | | 1.9931 (2.1429) | | 2.1507 (2.2713) |
| GDP per capita | | -2.3647 (2.0234) | | -2.5340 (2.1487) |
| Constant | 2.4029*** (0.0017) | -37.3953 (40.2709) | | |
| Observations | 2,236 | 2,227 | 2,118 | 2,109 |
| R-squared | 0.9035 | 0.9107 | | |
| Kleibergen-Paap F-statistic | | | 21.26 | 21.46 |
| Year FE | ✓ | ✓ | ✓ | ✓ |
| Dyad FE | ✓ | ✓ | ✓ | ✓ |

Notes: Robust standard errors clustered by host country in parentheses. All independent variables are lagged by one year. The 2SLS estimation models have a slightly lower number of observations than in the OLS estimation models due to home-host country dyads that have a 0 share of R&D FDI inflows in the years (2005-2007) used to construct the share variable. *** p<0.01, ** p<0.05, * p<0.1

weakly identified and would lead to biased results. The Sanderson-Windmeijer (SW) first-stage chi-squared and F statistics reject the null hypotheses that the endogenous regressor is underidentified and weakly identified. In the second stage model, the Kleibergen-Paap Wald rk F statistic is 25.70, again safely rejecting the null hypothesis that the instrument is weak.

The independent variable used in the main results is limited to only greenfield activity that excludes technology invested through mergers and acquisitions. I therefore use the Bureau of Economic Analysis' data that provides data on US multinationals' expenditures on overall "research and development performed" in other countries to further test the hypothesis. Results are displayed in Appendix §4 Table A.4 which

Table 3: First stage results for 2SLS estimation

| | (1) R&D investment |
|---|-----------------------|
| Shift-share instrument | 0.80*** (0.17) |
| Number of PTAs | -4.02 (9.02) |
| TRIPS Compliant | 6.29 (5.86) |
| Trade Dependency | -3.28 (4.19) |
| GDP | 81.34 (93.18) |
| GDP per capita | -73.52 (105.0) |
| Observations | 2,109 |
| Kleibergen-Paap F-statistic | 21.46 |
| Year FE | ✓ |
| Dyad FE | ✓ |
| Robust standard errors clustered by host country in parentheses | |
| *** p<0.01, ** p<0.05, * p<0.1 | |

provide support to H1 and are consistent with my argument that technology investments from institutionally stronger countries contribute to institutional development in host countries.

Differential institutional effects

Next, I evaluate the institutional effects that home government engagement achieves. Specifically, I test whether being targeted by the United States Trade Representative (USTR) or having IP commitments negotiated with the US leads to changes in IP institutions in a given host country, using separate dependent variable measures for de jure changes and de facto changes to intellectual property protection. Table 4 shows that US engagement with host countries is positively associated with changes to intellectual property law in host countries but not with levels of enforcement in the subsequent year. Model (1) to (3) show that measures of home country engagement are positively correlated with de jure changes to host country laws. In models (1) and

(2), having been targeted by the USTR is positively associated with IP reforms in the host countries the following year. In model (2), with other variables held constant, targeting by the US increases the Gold and Morin IP index by an average of 0.40 prior to TRIPS compliance (postTRIPS= 0), and an average of 0.23 ($= 0.40 + 0.76 - 0.93$) after a country complies with TRIPS. Both increases are substantial for an index that ranges from 0 to 9. As expected in the prior section, the effect of TRIPS targeting becomes weaker after a country complies with WTO terms for global intellectual property. The effect of USTR targeting on IP laws is weaker in model (3) after the economic size and income level of countries are accounted for ($p = 0.105$). In model (3) as well (1), having commitments to IP protection through trade or investment agreements with the US also tends to be positively correlated with changes to IP laws that adhere more to US standards, indicating success of US engagement with de jure changes to IP laws.³⁹ Using the original de jure measure of IPR changes in countries, Appendix §6 Table A.5 also shows that US government engagement is positively associated with changes to IP laws in host countries.

In models (4) to (6), home country engagement is not correlated with enforcement levels of intellectual property rights. Appendix §7 Table A.6 shows that the results are consistent using the World Economic Forum’s Executive Opinion Survey measure on enforcement levels of intellectual property protection. Using the specification in model (6), I further test whether measures of engagement are positively correlated with IP enforcement levels down the road. I find that enforcement levels are positively correlated with USTR targeting four years after a country is listed but not in earlier years, indicating that improvements to enforcement take effect much later after de jure changes. With the long lag between home country engagement and its effect on enforcement, enforcement changes are likely a combined result of home country bargaining and MNC engagement with the host government, as well as improvements in bureaucratic capacity.

³⁹Further, a country’s GSP status, GDP, and GDP per capita are significantly correlated with its IP law reforms. A country with GSP status is on average less likely to improve their IP laws (models (2) and (3)). Larger economies are on average significantly less likely to reform their IP system in accordance with US rules, and richer economies are on average significantly more likely to change their IP rules in a direction consistent with the US (model 3).

Table 4: Effect of USTR targeting on de jure and de facto changes to intellectual property protection

| | <i>De jure</i> (0-9) | | | <i>De facto</i> (1-10) | | |
|------------------------|----------------------|----------|----------|------------------------|---------|---------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Targeted | 0.46* | 0.40* | 0.15 | -0.00 | 0.06 | 0.08 |
| | (0.23) | (0.23) | (0.18) | (0.17) | (0.18) | (0.17) |
| Bilateral agreement | 0.61* | 0.39 | 0.61* | -0.24 | -0.27 | -0.19 |
| | (0.35) | (0.34) | (0.34) | (0.17) | (0.18) | (0.18) |
| TRIPS | 0.88*** | 0.76*** | 0.53* | 0.03 | 0.06 | 0.06 |
| | (0.28) | (0.27) | (0.31) | (0.18) | (0.20) | (0.19) |
| Target×TRIPS | -1.01*** | -0.93*** | -0.41 | -0.23 | -0.28 | -0.26 |
| | (0.32) | (0.32) | (0.35) | (0.18) | (0.18) | (0.17) |
| USPTO patents (log) | | 0.16 | 0.08 | | 0.06 | 0.08 |
| | | (0.14) | (0.13) | | (0.11) | (0.11) |
| Trade dependence (log) | | 0.14* | 0.05 | | -0.06 | 0.01 |
| | | (0.08) | (0.06) | | (0.13) | (0.13) |
| GSP country | | -0.79*** | -0.65*** | | -0.18 | -0.08 |
| | | (0.24) | (0.23) | | (0.15) | (0.14) |
| Foreign aid (log) | | -0.04 | 0.02 | | 0.00 | 0.01 |
| | | (0.04) | (0.03) | | (0.01) | (0.01) |
| IP law diffusion | | | -0.09 | | | -0.06 |
| | | | (0.09) | | | (0.05) |
| GDP (log) | | | -5.32*** | | | -0.99* |
| | | | (1.90) | | | (0.51) |
| GDP per capita (log) | | | 5.86*** | | | 1.22** |
| | | | (1.76) | | | (0.56) |
| Polity score | | | 0.04 | | | 0.04 |
| | | | (0.04) | | | (0.03) |
| Alliances (dummy) | | | -0.30 | | | -0.10 |
| | | | (0.43) | | | (0.25) |
| Constant | 0.58** | 2.43*** | 84.93** | 5.75*** | 5.27*** | 19.64** |
| | (0.24) | (0.79) | (32.34) | (0.15) | (0.57) | (8.31) |
| Observations | 980 | 959 | 948 | 1,230 | 1,196 | 1,171 |
| R-squared | 0.57 | 0.61 | 0.66 | 0.28 | 0.30 | 0.33 |
| Number of iso3n | 59 | 58 | 58 | 57 | 56 | 55 |
| Year FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Country FE | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

All variables are lagged by one year. Robust standard errors clustered by host country in parentheses. *** p<0.01, ** p<0.05, * p<0.1

8 Conclusion

Foreign firms investing in other countries cannot always rely on existing international institutions for property protection, and they are thus faced with the choice to forgo investment, invest with significant risk, or pursue alternative pathways to protect their interests. I show that firms engaging in international investment employ a two-tiered strategy that leads to stronger domestic property rights and stronger enforcement for intellectual property. In doing so, my paper follows the tradition of [North \(1981\)](#), [North and Weingast \(1989\)](#), [Acemoglu, Johnson, and Robinson \(2001\)](#) in examining development of domestic property rights institutions, but adopt a “second image reversed” approach ([Gourevitch, 1978](#)) that explores the consequences of international investment on domestic structures.

In contrast to existing accounts of foreign firms using institutions external to the host country to guarantee property rights, I argue that domestic institutions should be given more serious consideration as viable forums for protecting foreign investment. Evidence in my paper shows that foreign investments in technology can lead to a “closing the gap” effect in levels of intellectual property protection between the home and host country. This is realized through political strategies that MNCs use to engage in a “two-level bargaining” process that seeks favorable institutional outcomes for property protection within host countries’ domestic institutions. On the one hand, firms lobby their home government to apply pressure that enhances *de jure* IP protections. On the other hand, firms have better success in strengthening *de facto* IP protections through direct engagement with the host state. What is more, international investors can play a pivotal role in designing domestic rules for property protection, which not only affects foreign investors, but also reshapes how domestic laws affect the local market and local firms.

With technology and innovation-driven economic growth ever more central for national development and state competition, it is important to combine the study of international economic flows with their technology content. Nations lagging behind technology front-runners often take advantage of foreign technology to build industrial capacity, which calls for more understanding of how foreign technology can be protected in countries with relatively weak institutions.⁴⁰ My study points to

⁴⁰Through the 1950s, Japan’s Ministry of International Trade and Industry (MITI) maintained control of foreign exchange and used their power to favor certain types of technology imports over others ([Morris-Suzuki, 1994](#), p.168). Latin American states such as Argentina also found foreign

the importance of conceptualizing foreign direct investments as main contributors of technology and know-how to developing countries, and sheds light on how foreign firms are strategic actors within host country contexts that can induce new laws and regulations in favor of better property protection.

technology indispensable, and promoted industrialization policies that encouraged technology import and FDI from the electronics and telecommunications industries ([Chudnovsky, Lopez, and Porta, 1995](#)).

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SUPPLEMENTARY APPENDIX

1 International institutions for IP protection

The World Intellectual Property Organization (WIPO)

Key international treaties on intellectual property include the TRIPS Agreement (Agreement on Trade-Related Aspects of Intellectual Property Rights) administered by the World Trade Organization, the WIPO Copyright Treaty, the WIPO Performances and Phonograms Treaty, and the Paris Convention for the Protection of Industrial Property. A specialized UN agency, the World Intellectual Property Organization (WIPO) was tasked with administering previously established treaties such as The Paris Convention (1883) and the Berne Convention (1886). A common criticism of WIPO has been that it lacked enforcement powers and therefore had no teeth in its administration of the international treaties (Sell, 2003). Since the Uruguay Round concluded in 1995, the enforcement of global intellectual property rights has shifted from WIPO to the WTO. The responsibilities of WIPO mainly focuses on registration, technical support, and development of further governance measures (May, 2006).

WIPO also establishes external offices that offer services to provide arbitration and mediation. The offices are in the following locations: Algiers, Algeria; Rio de Janeiro, Brazil; Beijing, China; Tokyo, Japan; Abuja, Nigeria; Moscow, Russian Federation; Singapore, Singapore.⁴¹ These services focus on private party arbitration and mediation, and does not include administrative complaints that pertain to how states govern intellectual property protection, which is the focus of this paper. The services are also relatively less utilized than domestic courts within countries. As mentioned in the paper, judgments often need to be implemented through domestic courts as well. For instance, the WIPO office in China opened in Beijing in July 2014 and provides international patent registration services, including alternative IP dispute resolution and arbitration. There appears to have been 60 arbitration cases in China through WIPO in 2020.⁴² In comparison, the Beijing Intellectual Property Court established in 2014 has since received 13,164 foreign-related intellectual property administrative

⁴¹Source: <https://www.wipo.int/about-wipo/en/offices/>

⁴²Via Lisa Jorgenson, Deputy Director General of WIPO, at the “Tech, Trade & China 2021: The Future of Multilateral Approaches to China Tech Policy” event held on April 27, 2021.

cases.^{43,44}

The exposition in WIPOLex Judgement of the judicial structure of Mexico is representative of IP institutional structures around the world, which again focuses on domestic courts:

There are three types of intellectual property cases in Mexico:

Administrative Law Cases

Disputes arising from breaches of administrative law have various consequences. For cases involving registered users the penalty may consist of lapse, invalidation or cancellation of their registration. In the case of breaches by third parties who have abused rights recognized or granted, the penalties range from economic sanctions, orders to withdraw goods from circulation, the suspension of services and the closing of establishments.

Civil Law Cases

In cases where infringements harm third parties, damages must be sought through the courts, and specifically the civil law courts under civil law.

In nearly all cases a *firm decision must be issued by the administrative authorities or the Federal Tribunal of Administrative Justice before the civil claims can be filed*, since the decision will form the central document for the judicial action. Exceptions to this requirement include cases involving the right to a person's own image, in which case a prior administrative decision is not required to initiate civil law proceedings.

Proceedings commence in the lower courts, whose decisions are subject to appeal before a Unitary Federal Civil Court for decisions issued either by a federal judicial body or by a state or local Superior Court.

The decision on appeal can in turn be appealed to a Circuit Court.

It can thus be seen that for civil law cases there are no courts specialized in intellectual property.

Criminal Law Cases

Criminal proceedings are separate in Mexico from civil and administrative proceedings.

⁴³The Beijing Intellectual Property Court has exclusive jurisdiction over administrative cases of authorization and confirmation of intellectual property rights in China.

⁴⁴"Beijing Intellectual Property Court: Foreign-related Intellectual Property Cases Increasing Year by Year." DEQI Intellectual Property Law Corporation. Source: <http://ip.people.com.cn/n1/2019/1017/c179663-31405893.html>

The Law on Industrial Property includes provisions on conduct subject to sanction under criminal law.

The Federal Law on Copyright refers to the Federal Penal Code for the punishment of criminal copyright infringements.

The process for criminal law cases begins with legal notice, which must be submitted to the prosecution service of the Attorney General's Office.

Within the Attorney General's Office, a "Unit Specialized in the Investigation of Copyright and Industrial Property Offenses" (UEIDDAPI) is responsible for investigating all offenses related to intellectual property.

If the investigation concludes that a crime has been committed, the Public Prosecutor must bring criminal prosecution before a federal criminal law judge.

If finding sufficient evidence of such a crime, and who may have perpetrated it, the judge declares that proceedings must be initiated.

If the accused has been arrested the proceedings may commenced before another lower court judge, whose decisions may be appealed to the Unitary Federal Criminal Court and, in a second instance, to a collegial court.

There is a specialized authority for the investigation of intellectual property cases under criminal law– the Specialized Unit for the Investigation of Copyright and Industrial Property Offenses (UEIDDAPI). The courts, however, are not specialized.

The EU Intellectual Property Office

In the European Union, the European Union Intellectual Property Office (EUIPO) administers the EU's Trade Mark and Design rights, and sets up the European Union Intellectual Property Network to facilitate coordination among member states. It is a decentralized agency that aims at "facilitating and supporting the activities of national authorities" against patent infringement.⁴⁵ The European Observatory on infringements of IPR has responsibility for "a wide range of tasks relating to research, communication, dissemination of best practices, and support for enforcement of all types of IPRs,"⁴⁶ but there is no arbitration mechanism. As according to the EUIPO (2017), "countries are, however, free in their policy choice to create specialised courts for IPR-related disputes," and regulating intellectual property is still largely the prerogative of national governments and national courts.⁴⁷

⁴⁵EUIPO. "Specialised IP Rights Jurisdictions in the Member States." Q3 2017.

⁴⁶European Court of Auditors. "Audit Preview: Protecting intellectual property rights in the EU." December 2020.

⁴⁷EUIPO. "Specialised IP Rights Jurisdictions in the Member States." Q3 2017.

In 2019, the European Union established specialized IP courts within the General Court of the European Union (EGC) to handle IP cases. The IP cases that will be handled in these chambers are actions against decisions of the Boards of Appeal of the European Union Intellectual Property Office (EUIPO) and the Community Plant Variety Office (CPVO).⁴⁸ This institutional development is however too new to assess its impact on use of national courts for intellectual property cases.

2 Host and home countries included in main analysis

The following tables show the host countries and home countries as well as the number of observations for each country that are included in the main analysis. Greenfield investments in research and development is a relatively restrictive measure of foreign direct investment in technology, and many host-home country pairs do not have relevant activity in a given year, particularly in the 2005 to 2007 period from which data is used to construct the share variable for the Bartik instrument. I therefore limit the developing countries that are host countries in this analysis to be emerging markets. I further check to see whether the home country has better intellectual property institutions at the start of the sample period in 2008. There are three home-host country pairs that do not fulfill this empirical scope condition (Czech Republic to India, Italy to Malaysia, Italy to South Africa), and I exclude them from the analysis.

⁴⁸Christina Schulze. “General Court creates specialist IP chambers.” *JUVE Patent*. October 3, 2019.

Table A.1: Host countries included in the main analysis

| Host countries | Observations |
|----------------|--------------|
| Brazil | 256 |
| China | 308 |
| India | 293 |
| Indonesia | 129 |
| Malaysia | 206 |
| Mexico | 217 |
| Nigeria | 91 |
| Philippines | 119 |
| Russia | 280 |
| Saudi Arabia | 59 |
| South Africa | 169 |
| Thailand | 168 |
| Turkey | 191 |
| Total | 2486 |

Table A.2: Home countries included in the main analysis

| Home countries | No. |
|----------------|------|
| Australia | 51 |
| Austria | 64 |
| Belgium | 91 |
| Canada | 91 |
| Cyprus | 22 |
| Czech Republic | 39 |
| Denmark | 117 |
| Finland | 90 |
| France | 165 |
| Germany | 165 |
| Iceland | 11 |
| Ireland | 103 |
| Israel | 52 |
| Italy | 130 |
| Japan | 129 |
| Korea, Rep. | 93 |
| Luxembourg | 55 |
| Netherlands | 117 |
| New Zealand | 13 |
| Norway | 65 |
| Portugal | 13 |
| Singapore | 117 |
| Spain | 91 |
| Sweden | 117 |
| Switzerland | 155 |
| United Kingdom | 165 |
| United States | 165 |
| Total | 2486 |

3 Alternative dependent variable: Change in IPRI

I use the change in intellectual property protection levels in the host country, $IPRI_{i,t} - IPRI_{i,t-1}$, as an alternative dependent variable for testing H1. This specification is similar to using host country IP protection levels as the dependent variable, and controlling for a lagged dependent variable to account for time trends in host country institutions. However, this latter specification would result in the Nickell bias, which leads to biased coefficients when the number of cross sectional units is much larger than the number of time points in the data.

The table below shows that using a fixed effects model with dyad and year fixed effects, the estimation results using change in IP institutions as the dependent variable is highly consistent with the main results displayed in Table 2.

Table A.3: Effect of tech FDI on host country institutions

| | (1) Change in DV | (2) Change in DV |
|------------------|-----------------------|-----------------------|
| R&D FDI | 0.0001** (0.0000) | 0.0001*** (0.0000) |
| Number of PTAs | | -0.0373 (0.0420) |
| TRIPS Compliant | | -0.0499 (0.0907) |
| Trade Dependency | | 0.0127 (0.0249) |
| GDP | | -0.1920 (0.7376) |
| GDP per capita | | 0.3367 (0.6574) |
| Constant | 0.0717*** (0.0009) | 4.5940 (13.6280) |
| Observations | 2,272 | 2,067 |
| R-squared | 0.3431 | 0.3613 |
| Dyad FE | ✓ | ✓ |
| Year FE | ✓ | ✓ |

Notes: Robust standard errors clustered by host country in parentheses. All independent variables are lagged by one year.*** p<0.01, ** p<0.05, * p<0.1

4 Alternative sample: US multinationals

The second measure for foreign direct investment in technology is research and development expenses of majority-owned foreign affiliates of multinational corporations based in the United States. This data comes from the United States' Bureau of Economic Analysis, and decomposes foreign direct investment into "property, plant, and equipment" expenditures and expenditures on "research and development performed." Table A.4 shows the results of using research and development expenditures by US multinational corporations in host countries as the measure for technological investments. The dependent variable is the quality of host country IP institutions as measured by IPRI. The independent variable of concern is constructed as the ratio of research and development performed to property, plant and equipment expenditure, which indicates the proportion of investment in technological development as opposed to physical assets. The higher this ratio is, the more important intangible assets are to the investing firms, and the more likely that they will be deploying their resources to protecting their intellectual property in host countries.

Model (1) estimates the relationship between the ratio of R&D-to-physical assets expenditures and host country IP institutions using host country fixed effects and year fixed effects. Model (2) takes into account alternative explanations. Model (2) shows that a one unit increase in the R&D-to-physical assets ratio is associated with 0.55 increase in the IPRI score of the host country. In other words, if the relative expenditure on R&D for US multinational firms increases from 2 times to 3 times that on physical assets in a host country, the host country's level of intellectual property protection increases 0.55 on average. Considering that the IPRI score used as the dependent variable ranges from 2 to 9, a 0.55 increase is significant improvement. In model (3), the sample excludes host countries that experience minimal to no research and development investment from US multinational firms. The coefficient estimate stays stable, but the statistical significance slightly surpasses the 10% critical value due to loss of statistical power after dropping observations ($p = 0.102$).

5 Morin and Gold Index

The Morin and Gold Index codes specifically for the existence of intellectual property laws in developing countries that are not required under the WTO TRIPS but comply

Table A.4: Effect of R&D Expenditures on Host country IPRI score

| | (1) All | (2) All | (3) With R&D |
|---|---------------------|---------------------|---------------------|
| R&D-to-physical assets ratio (lag) | 0.577* (0.321) | 0.551* (0.303) | 0.517 (0.319) |
| Host country IPRI (lag) | 0.488*** (0.048) | 0.459*** (0.048) | 0.465*** (0.064) |
| Trade agreements with IP provisions (lag) | | -0.004 (0.057) | -0.022 (0.060) |
| TRIPS compliant | | -0.188 (0.129) | -0.008 (0.022) |
| Trade dependence (log, lag) | | -0.020 (0.037) | 0.059 (0.058) |
| GDP (lag, log) | | -0.195 (0.228) | -0.045 (0.360) |
| GDP per capita (lag, log) | | 0.427* (0.230) | 0.329 (0.360) |
| Constant | 2.991*** (0.275) | 7.582** (3.687) | 5.455 (5.906) |
| Observations | 905 | 880 | 697 |
| R-squared | 0.985 | 0.985 | 0.985 |
| Host FE | ✓ | ✓ | ✓ |
| Year FE | ✓ | ✓ | ✓ |

Standard errors clustered by host country in parentheses

*** p<0.01, ** p<0.05, * p<0.1

with more stringent IP standards that the United States is pursuing globally. The 9 criteria for the laws included in this index are the following ([Morin and Gold, 2014](#), Appendix B):

- 1) Patentability of plants (excluding plant variety protection): If no, 0; if neither specifically permitted nor prohibited, 0.5; if yes, 1.
- 2) Copyright term of 70 years or more after death: If no, 0; if yes, 1.
- 3) Prohibition of the dissemination of technology used to circumvent measures that control access to copyrighted works: If no, 0; if prohibition is on commercial dissemination only, 0.5; if prohibition covers non-commercial dissemination as well, 1.
- 4) Ratification of UPOV91: If no, 0; if yes, 1.
- 5) Ratification of WIPO internet copyright treaty: If no, 0; if yes, 1.
- 6) Ratification of the Brussels Convention on satellite signal: If no, 0; if

yes, 1.

7) Requirements for the protection of pharmaceutical data for at least five years: If no, 0; if yes, 1. Note that protection “against unfair commercial use” and “against disclosure by a third party” without a specific time limit of five years or more were not considered sufficient.

8) National or regional exhaustion of patent rights (as opposed to international exhaustion): If no, 1; if yes, 0. In the case of South Africa and the Philippines, which adopt national exhaustion but create an exception for pharmaceuticals, a score of 0.5 was assigned.

9) Compulsory licenses may granted: If only for anti-competitive practices or national emergencies, 1; if only for anti-competitive practices, national emergencies, failure to work, insufficient working, or use for use of a dependent patent, 0.5; if for any reasons beyond those already listed, 0.

6 Alternative de jure measure

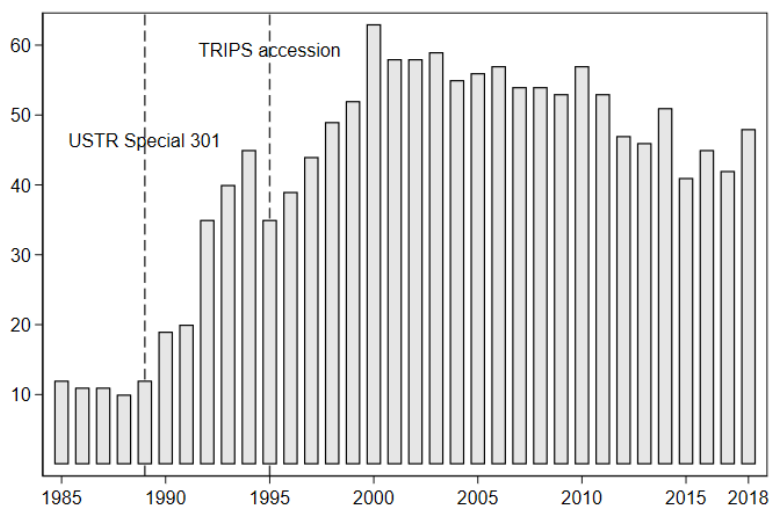
To test H2 on a more comprehensive set of countries and years, I collect an original set of data on de jure IP laws using the laws posted on the World Intellectual Property Organization’s WIPOLex portal.⁴⁹ A specialized agency of the United Nations, WIPO was created in 1970 to promote and protect intellectual property (IP) at the international level. WIPOLex houses the most comprehensive collections of IP laws and treaties to the 193 Member States of WIPO. The Member States are legally obligated to communicate to the International Bureau of WIPO all new laws and official texts concerning the protection of industrial property and copyright, which WIPO then publishes on its website portal. From each country’s legal repository in WIPOLex, I collect information on the year when main IP laws are enacted or amended by the legislature in a given country. This then forms a dummy variable where the years a country has legislative changes to IP laws is notated by 1. For a given country, it could have no laws enacted or amended in a given year, or it could have as many as 16.

Figure A.1 shows the number of countries that passed or made amendments to their main intellectual property laws each year from 1985 to 2018. The most significant international agreement on intellectual property rights, the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) came into effect

⁴⁹Source: <https://wipolex.wipo.int/en/members>

in 1995, but a substantial number of countries are active in legislating intellectual property law post 1995 and into the 2010s, suggesting that unilateral dynamics such as the USTR’s Special 301 annual review also bring about legal changes to IP laws in countries.

Figure A.1: Number of countries with legislative changes to IP law (1985-2018)



Notes: Data collected by author from the World Intellectual Property Organization’s WIPOLex depository. Change to IP laws includes amendments and new laws for main intellectual property laws adopted through the legislatures of relevant countries. Figure A.1 displays the number of countries with changes to intellectual property law each year from 1985 to 2018, among a total of 190 countries. 1989 is the first year that the USTR Special 301 review report is published; 1995 is the year that the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) comes into force.

This original measure of IP compensates for the constraints of the Gold & Morin index but also has two limitations. The measurement only includes de jure changes to main IP laws and does not take into account revisions of IP-related laws. Such laws can be civil, criminal, or commercial procedures that contain provisions on intellectual property but are not focused solely on this issue area. In addition, laws might also be revised to loosen IP standards in order to meet development objectives or to meet domestic interest group interests.

Table A.5 uses a logit model on panel data to estimate the effects of US government engagement on IP laws in foreign countries. Log odds coefficients are shown in the table results. All else equal, converting the coefficient 0.37 in model (3) from log odds

to probability, being targeted by the USTR in a given year increases the probability of a host country revising its intellectual property law by 59%.

Table A.5: Effect of US engagement on IP laws: WIPO measure

| | (1) | (2) | (3) |
|------------------------|-------------------|------------------|------------------|
| Targeted | 0.40*** (0.15) | 0.43** (0.19) | 0.37* (0.19) |
| Bilateral agreement | 0.62*** (0.23) | 0.40 (0.32) | 0.37 (0.32) |
| TRIPS | -0.44 (0.27) | -0.34 (0.32) | -0.35 (0.28) |
| Target \times TRIPS | -0.38** (0.19) | -0.37* (0.22) | -0.32 (0.20) |
| USPTO patents (log) | | 0.13 (0.10) | 0.10 (0.11) |
| Trade dependence (log) | | 0.07 (0.08) | 0.06 (0.07) |
| GSP country | | 0.02 (0.21) | -0.05 (0.21) |
| Foreign aid (log) | | 0.03* (0.02) | 0.04** (0.02) |
| IP law diffusion | | | 0.00 (0.13) |
| GDP (log) | | | -0.10 (0.51) |
| GDP per capita | | | 0.28 (0.56) |
| Polity score | | | 0.04 (0.03) |
| Alliances (dummy) | | | -0.01 (0.36) |
| Observations | 2,910 | 2,714 | 2,477 |
| Number of iso3n | 97 | 94 | 86 |
| Year FE | ✓ | ✓ | ✓ |
| Country FE | ✓ | ✓ | ✓ |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

7 Alternative de facto measure

An alternative measure for measuring de facto IPR protection in countries comes from the World Economic Forum’s Executive Opinion Survey published in the Global Competitiveness Reports. This survey fielded starting from 2007 asks business executives to respond to the survey question “In your country, to what extent is intellectual property protected? [1 = not at all; 7 = to a great extent]”, reflecting de facto protection of intellectual property over time. Table A.6 shows that similar to Table 4, USTR targeting does not effectively change IP enforcement levels in host countries.

Table A.6: Effect of USTR targeting on intellectual property enforcement levels (WEF)

| | (1) | (2) | (3) |
|------------------------|---------|---------|--------|
| | WEF | WEF | WEF |
| Targeted | -0.09 | -0.16** | -0.10 |
| | (0.08) | (0.07) | (0.08) |
| Bilateral agreement | | | -0.21 |
| | | | (0.19) |
| TRIPS | 0.25** | 0.16 | 0.25* |
| | (0.12) | (0.11) | (0.13) |
| Target×TRIPS | 0.02 | 0.09 | 0.04 |
| | (0.09) | (0.08) | (0.09) |
| USPTO patents (log) | | -0.05 | -0.06* |
| | | (0.03) | (0.03) |
| Trade dependence (log) | | -0.07 | -0.01 |
| | | (0.04) | (0.05) |
| GSP country | | -0.09 | -0.06 |
| | | (0.07) | (0.06) |
| Foreign aid (log) | | -0.01 | -0.00 |
| | | (0.01) | (0.00) |
| IP law diffusion | | | 0.05* |
| | | | (0.03) |
| GDP (log) | | | 0.27 |
| | | | (0.31) |
| GDP per capita (log) | | | 0.27 |
| | | | (0.31) |
| Polity score | | | -0.02 |
| | | | (0.02) |
| Alliances (dummy) | | | -0.11 |
| | | | (0.12) |
| Constant | 3.85*** | 4.02*** | -4.94 |
| | (0.09) | (0.19) | (5.33) |
| Observations | 950 | 936 | 898 |
| R-squared | 0.41 | 0.42 | 0.47 |
| Number of iso3n | 90 | 88 | 83 |
| Year FE | ✓ | ✓ | ✓ |
| Country FE | ✓ | ✓ | ✓ |

Standard errors clustered by country in parentheses

*** p<0.01, ** p<0.05, * p<0.1