# Who Harmonizes?:

# Bilateral regimes and multilateral underpinnings

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**Abstract**

Regulatory harmonization across countries is often motivated by multilateral and unilateral sources of pressure. Yet relatively few empirical studies have disentangled these concurrent dynamics and distinguished their regulatory effects. I posit that different channels for regulatory convergence can either compound or counteract the effects of one another. I use a newly collected measure of country compliance with the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) and interact it with measures of bilateral engagement on IP to test my hypotheses. I find that bilateral engagement by the United States Trade Representative is less likely to achieve regulatory changes in foreign countries after a given country complies with TRIPS requirements. My findings reveal that legitimacy of unilateral pressure can diminish after pressure from multilateral regimes is lifted, thereby shedding light on conditions that determine the policy space for bilateral engagement and demands.

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# 1 Introduction

International institutions have been central to regulatory harmonization across a range of regulatory realms and standards (Simmons, 2001; Prakash and Potoski, 2006; Holzinger, Knill and Sommerer, 2008). However, recent efforts to harmonize global rules through international institutions tend to have stalled. The World Trade Organization's appellate body has been effectively disabled since 2019.[1] The 2022 United Nations Climate Change Conference (COP27) according to some assessments also did not reach its objectives.[2] Others lament how the World Health Organization was not able to play a bigger role in the Covid-19 crisis and coordinate pandemic response in countries.[3] In a time when international cooperation seems to be making slower progress in multilateral forums, are bilateral channels of engagement a more effective and viable path to regulatory harmonization?

In a complex system of international and domestic institutions (Alter and Meunier, 2009), regulatory efforts on the same issue area tend to be carried out in separate venues at the same time, and the question remains whether these regulatory efforts work towards a common goal and bring about greater regulatory harmonization. This paper therefore asks if multilateral and bilateral channels of regulatory pressure achieve compounding effects towards regulatory harmonization. It argues that this may not always be the case: while multilateral and bilateral sources of pressure are likely to compound one another when a country has not complied with multilateral rules, the legitimacy of bilateral demands may be weakened after a country has complied with the regulatory requirements of the multilateral regime. Accordingly, domestic coalitions and the will to reform in countries will change due to the changing nature of bilateral demands. In other words, bilateral engagement can be stepping stones or stumbling blocks for regulatory harmonization depending on whether countries are

[1] Yuka Hayashi. July 11, 2022. "U.S. Seeks to Fix WTO's Broken Trade Dispute Process." *Wall Street Journal*.

[2] Georgina Rannard. November 22, 2022. "COP27: Climate costs deal struck but no fossil fuel progress." *BBC*.

[3] Stewart Patrick. July/August 2020. "When the System Fails COVID-19 and the Costs of Global Dysfunction." *Foreign Affairs*.

compliant members of multilateral regimes. This paper considers multilateral, plurilateral, and bilateral regimes to be on a continuum of legitimacy, with multilateral regimes generally the most legitimate, and bilateral regimes the least legitimate. Plurilateral regimes are conceived to have generally less legitimacy than multilateral ones, but its degree of legitimacy does not diminish as much as bilateral regimes following multilateral compliance.

In international trade, scholars have examined whether preferential trade agreements (PTAs) are stepping stones or stumbling blocks for the WTO, and tend to focus on tariff rates or trade flows to consider PTAs' effect on trade liberalization. Studies rarely consider the reverse,[4] in that multilateral regimes can also spur or dampen bilateral engagement and affect its degree of success, which is important to understand given a regime complexity of trade in which bilateral institutions are an integral part of. What is also worth considering is the increasing presence of "behind-the-border" measures on trade that accompanies proliferation of trade regimes. Unlike tariffs, these measures do not stop at the border and result in regulatory changes that change the domestic rules of the game for both foreign and domestic producers alike. Such rules are likely to provoke reactions by domestic groups in the implementing state (Garrett, 1995; Goldstein and Martin, 2000; Kaufman and Segura-Ubiergo, 2001), resulting in different levels of effective implementation.

To test the argument, the paper focuses on multilateral, bilateral, and to a lesser extent plurilateral regulatory efforts in one of those "behind-the-border" regulatory domains, intellectual property (IP) protection. Intellectual property refers to creations of the mind, such as inventions, designs, and other technology know-how. Company assets in the form of intellectual property are subject to protection by law, such as proprietary technology protected by patents and trade secrets. The common understanding is that bilateral engagement indeed ratchets up intellectual property standards globally, especially in a period when further reforms are stagnant in multilateral regimes such as the WTO. With a newly collected measure of country compliance with the WTO Agreement on Trade-Related Aspects of In-

[4] An exception is Mansfield and Reinhardt (2003), who provide an explanation for why PTAs are proliferating despite of liberalization reached through the WTO.

tellectual Property Rights, I find instead that bilateral engagement can lack the legitimacy that multilateral negotiation has, thereby making it more difficult to change domestic rules and regulations in developing countries despite relatively frequent bilateral negotiations. I do not find that plurilateral agreements encounter hurdles in regulatory harmonization to such a degree.

This paper contributes to the literature on three fronts. It draws from the regime complexity literature to study behind-the-border regulation in trade, and addresses the gap in our understanding of how multilateral and bilateral regimes can interact to affect regulation across borders. It reveals that such interactions can produce either compounding or counteracting effects on regulatory harmonization across countries, thus contributing to a deeper understanding of how regulatory frameworks in the global economy affect domestic rules in different countries. Second, it adds to the discussion of legitimacy in international regimes and shows that differing degrees of legitimacy may impact their effectiveness in making rules across borders. Lastly, it advances understanding of implementation politics within the states targeted by multilateral and bilateral efforts of regulatory harmonization. Different domestic interest groups can be activated and empowered depending on how new rules agreed upon in bilateral and multilateral agreements are perceived domestically, which then has implications for the degree to which regulatory change can actually be achieved.

## 2 Interaction of multilateral and bilateral regimes

In trade politics, the discussion of institutional complexity in trade has focused on how preferential trade agreements are building blocks or stumbling blocks to trade liberalization, with arguments on both sides.[5] Goldstein, Rivers and Tomz (2007) propose the concept of institutional embededness to characterize the complexity of the international trade regime with the GATT/WTO system "embedded in a system of other trade agreements, including

[5]See Davis (2009) and Krueger (1999) for summaries of these arguments.

PTAs" (p.44), and find that international trade agreements tend to complement each other in global trade. Others explain the rise of regionalism in the age of multilateralism while acknowledging that the aggregate welfare effects are unclear (Mansfield and Milner, 1999; Mansfield and Reinhardt, 2003). Others find evidence for the stumbling block argument in that multilateral tariff cuts are smaller for products that are also imported from countries that are members to PTAs (Limão, 2006). In the discussion of whether PTAs are trade creating or trade diverting, trade forums are viewed to compete with one another for "business," namely for trade activity that states conduct with one another.

What is less discussed in the literature is the idea that bilateral and plurilateral arrangements are efforts to seek additional trade liberalization on top of the concessions gained in multilateral forums. This is surprising given that the idea has been prevalent in US trade policy,[6] and in recent decades the US has consistently sought to sign "WTO plus" agreements that go beyond what is guaranteed under WTO rules. Powerful actors are able to engage in forum shopping for their next best arena to reach their policy goals, and bilateral and plurilateral forums become more attractive when multilateral forums become deadlocked. In the regime complexity literature, this is also a form of "forum shifting" (Helfer, 2009; Sell, 2011) where states intentionally shift agendas to other venues when they face resistance and veto barriers in the current venue.[7] The Trans-Pacific Partnership Agreement that the US reached with 11 other countries in 2016 for example is a prominent case of a "TRIPS plus" agreement, in the sense that it pushed forward intellectual property standards that were more stringent than TRIPS.

Relatedly, it has been less examined whether non-tariff regulatory rules in these trade forums actually build on one another or undercut each other. The literature on foreign aid

[6]See Krueger (1999) for a discussion of the US "two-track" approach towards trade policy in multilateral forums and outside of them.

[7]Forum shifting is not a straightforward process from multilateral to forums with less players. The US tried to revive the World Intellectual Property Organization (WIPO) as its forum of choice for further advancements in IP after resistance to the agenda in the WTO with the Doha round, but failed to do so.

draws a more direct link of multilateral and bilateral engagement with governance outcomes, with scholars debating whether multilateral or bilateral aid is more effective at promoting development (Martens et al., 2002; Dreher, Sturm and Vreeland, 2009; Gartzke and Naoi, 2011; Findley, Milner and Nielson, 2017). One side of the debate has argued that multilateral aid can be less politically biased and more effectively finance developmental goals (Milner, 2006), whereas strong states tend to form bilateral agreements with weak states to better impose their interests (Zawahri and Mitchell, 2011) and maintain control over aid policy (Milner and Tingley, 2012). Multilateral organizations are also better at monitoring the recipient on their use of aid to achieve better development results. However, fewer studies have considered if multilateral and bilateral aid can interact and affect the governance outcomes of each channel.

This paper contributes to the literature by distinguishing policy outcomes in terms of bilateral and multilateral regimes in trade, as well as by assessing the policy outcomes of these two interrelated regimes in terms of non-tariff measures that lead to governance effects in developing countries.

It also conceptualizes multilateral, plurilateral, and bilateral regimes to be on a continuum of legitimacy, with multilateral regimes most legitimate and bilateral regimes least legitimate in general. Adopting a sociological understanding of political legitimacy as in Tallberg and Zürn (2019), political legitimacy "lies with the beliefs and perceptions of audiences," (p.585). It is a "subjective quality" (Hurd, 1999, p.381), and is defined by an audience's perceptions of the institution rather than by the characteristics of the institution itself. This paper follows past literature in arguing that audiences such as member states in IOs as well as the domestic public within them tend to perceive multilateralism as more legitimate than unilateralism (Hurd, 2005; Pelc, 2010). More legitimacy also tends to lead to better compliance by states. States are likely to be normatively motivated to follow rules when they regard these rules to be more legitimate (Hurd, 1999).

In the realm of intellectual property, the contextual ground for this paper, multilateral

obligations may spur additional agreements and reform in developing countries. This is especially the case when developing countries are not yet compliant with their multilateral obligations. When developing countries are still implementing reforms and regulations in order to meet multilateral commitments, unilateral demands can be put forth under the auspices of multilateral requirements, and enhance chances of reform in the developing country. When the commitment to reform is made in a multilateral forum, domestic coalitions and groups that oppose reform have a much harder time presenting a viable case.

Anecdotes provide suggestive support for this argument. The francophone African countries reached the revised Bangui Agreement in 1999 through the regional Organisation Africaine de la Propriété Intellectuelle (OAPI) in order to meet TRIPS requirements, and the agreement in fact went above and beyond intellectual property protection requirements in TRIPS (Deere, 2009, p.255-260). In 1995, the International Intellectual Property Alliance, a private sector coalition of seven US trade associations, was dissatisfied with Nicaragua's protection of copyrights and filed a petition with the USTR. The petition asked for Nicaragua to be removed from Caribbean Basin Initiative (CBI) status, a preferential trading status that Nicaragua had obtained with the US since 1983. This petition was not accepted by the USTR, but similar demands were strong enough to prompt the US to negotiate a bilateral intellectual property (BIP) agreement with Nicaragua at the end of 1997 (Drahos, 2001). This agreement was to be implemented by July 1999, which is ahead of 2000, the year that Nicaragua was slated to implement its TRIPS obligations (Drahos, 2001).

On the other hand, it may also be the case that a multilateral regime can undermine bilateral efforts in achieving regulatory outcomes. Unilateral demands regarding intellectual property rights, especially those that are made publicly, are unlikely to be received as favorably as multilateral obligations by developing countries. Such demands can be perceived as illegitimate, and could lead to reputational loss for the host country if it chooses to comply (Pelc, 2010). States "seek to control the signal sent by their response to threats" and are less likely to comply with unilateral demands than multilateral ones (Pelc, 2010, p.70). As

Morin and Gold (2014, p.788) put it, "in public debate, the TRIPs agreement provides a baseline against which to assess the legitimacy of claims regarding the level of IP protection in developing countries. Although, from a legal point of view, TRIPs provides only a floor of obligation, it also provides a discursive ceiling on legitimate pressure." Domestic interest groups that oppose IP legislation also have a stronger case against less legitimate demands and can be more effective in weakening their government's commitment to IPR reform. The US government for example initiated a WTO case concerning TRIPS that alleged that Argentina failed to protect test data in products such as pharmaceuticals adequately. However, Argentina's rules had strong support in its legislature and from its generic pharmaceutical industry, and Argentina did not accept the US claim or change its laws (Correa, 2004; Deere, 2009). In addition, in terms of negotiations on investment, trade, or intellectual property rights, developing countries often face the dilemma of limiting development space in exchange for market integration (Shadlen, Schrank and Kurtz, 2005). For this reason they will also be reluctant to meet demands from developed countries in a bilateral context especially when such demands exceed concessions that they had made in a multilateral regime.

A telling case of how governments and coalitions mobilize in light of unilateral demands that are perceived as illegitimate is the case of patent rules in Brazil. Brazil passed domestic legislation in 1997 that imposed a "local working" requirement on patent owners, which stipulated that if the product for which the patent was granted for was not manufactured in Brazil within three years after receiving the patent, then the patent may be subject to compulsory licensing, which allows other firms to use the same patent and make identical products for the Brazilian market (Article 68) (Bird, 2006). The American pharmaceutical industry objected strongly to this law, and the US responded by both targeting Brazil on the USTR Special 301 watch list, and by launching a WTO case against Brazil which argued that the law contravened TRIPS, which "prohibits national patent protection laws from discriminating with regard to the locale of invention" (Bird, 2006, p.406). Brazil countered by arguing that the law would help Brazil to provide affordable medicine to Brazilians

affected by AIDS (Bird, 2006). In 2002, during a NGO National Meeting at Recife, Brazil, 250 delegates organized a march to the U.S. consulate to express opposition to the U.S. government complaint against Brazil filed before the WTO (Passarelli and Veriano Terto, 2002). The US eventually dropped this demand.

If multilateral and bilateral channels of engagement both motivate countries to comply with relevant demands and change their rules of governance, we would expect a compounding effect on regulatory harmonization. On the other hand, if multilateral and bilateral channels of engagement counteract one another in their efforts to bring about regulatory changes in countries, we would expect a counteracting effect on regulatory harmonization. I therefore generate the following hypotheses:

> **Compounding effect hypothesis:** When countries have not met multilateral commitments, multilateral and bilateral channels for regulatory convergence compound the effects of one another.

> **Counteracting effect hypothesis:** When countries have met multilateral commitments, the multilateral regime counteracts bilateral channels for regulatory convergence and diminish their effects.

Theoretically speaking, regional trade agreements are plurilateral in nature, and one would expect changes to IP laws implemented on the basis of regional agreements to be perceived with more legitimacy than bilateral demands from domestic audiences. However, regional trade agreements typically also push for more stringent rules of intellectual property protection than what the WTO TRIPS agreement requires, which similar to bilateral demands could also elicit resistance from domestic audiences for the aforementioned reasons. This paper therefore also tests for the role of PTAs in regulatory convergence depending on countries' status with their multilateral commitment.

# 3 The international intellectual property rights regime

The most encompassing multilateral agreement reached in intellectual property rights is the World Trade Organization's (WTO) Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement, reached in 1995 among 123 countries in the Uruguay round of the WTO. At the time of TRIPS negotiation, negotiators expected that bilateral negotiations and engagements on intellectual property rules would decrease after a comprehensive international agreement is reached. A statement in 1989 from the Director for Intellectual Property at the United States Trade Representative expressed this sentiment: "What happens if we fail [to obtain TRIPS]? ... First, will be an increase in bilateralism."[8] While many countries at the time thought TRIPS was negotiated to be "a ceiling on intellectual property rules," it became the floor for global intellectual property rights and "was a beginning and not an endpoint" for cross border regulatory efforts in this area (Sell, 2011, p.448). Powerful states such as the US have engaged in what Sell (2011) calls "forum shifting" and created new venues, often bilateral, to push for more stringent intellectual property rights rules than the ones agreed to multilaterally.

The US, as one of the primary producers of knowledge intensive goods and services in the world, is the most active state in pushing for higher standards in intellectual property rights, both before and after the formation of TRIPS. Since 1989 the United States Trade Representative (USTR) has conducted a Special 301 annual review of countries' intellectual property (IP) practices pursuant to Section 301 of the Trade Act of 1974. The review produces a report the centerpiece of which is a watch list that ranks countries 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.[9]

[8]Emory Simon. "Remarks of Mr. Emory Simon", Symposium: Trade-Related Aspects of Intellectual Property, 22 *Vanderbilt Journal of Transnational Law*, 1989, 370.

[9]See Shadlen, Schrank and Kurtz (2005) for institutional details on how the watch list builds towards trade sanctions.

A total 99 countries have been targeted by the USTR since 1989, including both developing countries such as Uruguay and Vietnam, as well as developed economies such as Germany and Canada. Oftentimes, USTR targeting is followed by bilateral dialogues and negotiations with foreign governments to address US concerns, and to the extent that such engagement is successful, these concerns are addressed by foreign countries' legislation and reforms, in addition to being incorporated into trade agreements and investment agreements signed with the US.

It is useful to note that TRIPS requirements and additional rules for intellectual property can be compared in the same regulatory space, and rules advocated by the US and other developed economies in venues outside the WTO are more stringent and provide more extensive protection to intellectual property. In the language of the WTO itself, the TRIPS agreement can be understood as a "minimum standards agreement", and members to the agreement can choose to implement laws that offer more extensive protection, "so long as the additional protection does not contravene the provisions of the agreement."[10] Regional trade agreements, especially more recent ones, include provisions on intellectual property protection that are a step up from TRIPS provisions. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) signed in 2018 for example, includes stipulations on sound protections and IP infringements that developing countries such as Vietnam would need to revise their legal systems to conform to.[11] Up to 2018, 390 preferential trade agreements (PTAs) were signed to include TRIPS-plus commitments that go beyond TRIPS requirements. On average, each agreement include 5 provisions that guarantee intellectual property rights beyond TRIPS (Surbeck, 2019). It is safe to assume that bilateral and regional efforts at intellectual property protection in the post-TRIPS period pushed countries to implement stronger rules for protection.

[10]"Frequently asked questions about TRIPS in the WTO." World Trade Organization. Link: https://www.wto.org/english/tratop_e/trips_e/tripfq_e.htm. Accessed September 15, 2022.

[11]Apolat Legal. April 12, 2022. "IP Law In Vietnam And CPTPP." https://www.lexology.com/library/detail.aspx?g=d171b514-20e8-4e92-8396-8e72000febc8

The intellectual property index composed by Morin and Gold (2014) is helpful for illustrating the additive nature of US demands on intellectual property protection in foreign countries with rules agreed upon at TRIPS. This index is used for analysis later in this paper, and codes specifically for the existence of intellectual property laws in developing countries that are not required under the WTO TRIPS agreement but comply with more stringent IP standards that the United States is pursuing globally. For example, two of the 9 criteria for the laws included in this index are the following (Morin and Gold, 2014, Appendix B): 2) Copyright term of 70 years or more after death: If no, 0; if yes, 1. 5) Ratification of World Intellectual Property Organization (WIPO) internet copyright treaty: If no, 0; if yes, 1. In contrast, in the TRIPS agreement, member states are not required to ratify the WIPO Internet Copyright treaty, and the general rule is that the copyright term of protection is the life of the author and 50 years after their death.

# 4 Data and research design

## Data

**Bilateral engagement** As the main measure of US unilateral demands on IP practices in foreign countries and bilateral engagement with foreign governments following such demands, I collect data on the watch list of countries that are included in the USTR's Annual Special 301 Report on Intellectual Property Protection. 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.[12] Country-year engagement is coded as a dummy variable, with 1 indicating a country being on the USTR watch list in a given year.

**Regulatory harmonization in IP** 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. Because regulatory harmonization in IP is mostly driven by US interests, this index serves as a measure of the degree to which intellectual property protection is harmonized across countries. 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. 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. 59 developing countries from the years 1995 to 2011 are included in the sample.

**Compliance date with TRIPS** Even though the TRIPS agreement was formally passed by all WTO members at the Uruguay round in 1995, countries invariably needed additional time to reform their domestic laws and institutions to meet TRIPS terms on intellectual property protection. Countries then undergo a review process with The Council for TRIPS ("TRIPS Council") established within the WTO, which is the body legally responsible for administering and monitoring the operation of the TRIPS Agreement.[13] According to the WTO, the review on TRIPS compliance operates as follows:

> Initially, the review exercise focused on those developed country members whose transition period expired on 1 January 1996. Their legislation was reviewed in 1996 and 1997 in four week-long meetings. ... The legislation of developing coun-

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

[13]Details about TRIPS Council: https://www.wto.org/english/tratop_e/trips_e/intel6_e.htm

> try members whose transition period expired on 1 January 2000 was reviewed in 2000 and 2001. ... The procedures for these reviews provide for written questions and replies prior to the review meeting, with follow-up questions and replies during the meeting. At subsequent meetings of the Council, an opportunity is given to follow up points emerging from the review session which delegations consider have not been adequately addressed (Document IP/C/W/543 p.15).[14]

In reality, countries were a lot more varied in their timelines to TRIPS compliance. Some completed their reviews before the imposed deadlines, and some were unable to meet the previously agreed to timelines (Deere, 2009). The Doha Round of the WTO also extended the deadline for least developed countries to meet their TRIPS obligations to January 1, 2016. I collect data on a more accurate date for TRIPS compliance using the WTO's E-TRIPS gateway. The gateway houses a database of WTO members' laws and regulations notified pursuant to Article 63.2 of the TRIPS Agreement, which lays out the terms for transparency and disclosure: "Members shall notify the laws and regulations referred to in paragraph 1 to the Council for TRIPS in order to assist that Council in its review of the operation of this Agreement."[15] Once notified, the laws are reviewed by members in the TRIPS Council. The completion of a review is marked by records of reviews that the Secretariat produces. The records of reviews are circulated in the IP/Q/-, IP/Q2/-, IP/Q3/- and IP/Q4/- series of documents. I therefore use the date that these documents are published as the date that a member state is deemed to have passed the TRIPS Council's review on its IP practices. Different aspects of IP law such as those on copyright or patents can be posted a year or two apart, and I take the average year of review completion as the year a WTO member state passed the review of the TRIPS council.[16] Figure 1 shows that the number of countries that complete the TRIPS council review from the years 1995 to 2017. As the figure shows,

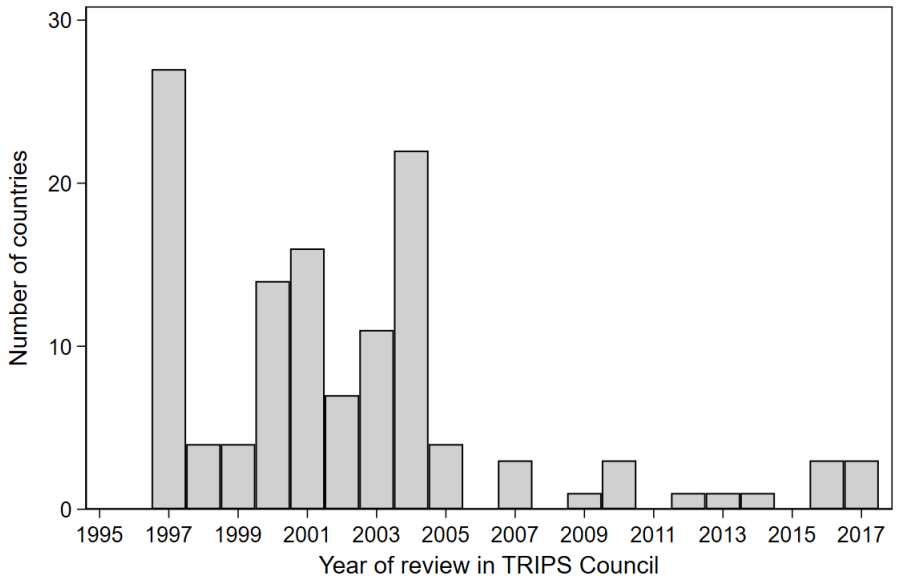
[14]WTO Council for Trade-Related Aspects of Intellectual Property Rights. "TIMELINESS AND COMPLETENESS OF NOTIFICATIONS AND OTHER INFORMATION FLOWS." Note by the Secretariat. Document IP/C/W/543. October 22, 2009.

[15]See link to E-TRIPS gateway here: https://bit.ly/3ukKqSz

[16]In some cases, addendum to the IP/Q* documents will be posted at later dates. These are cases where other states have additional questions in connection to the review of a member state's legislation which require the member state to answer at a later date.

there is more variation to TRIPS compliance by countries than the formal deadline originally imposed by the WTO.

Figure 1: Number of countries that complete TRIPS Council review (1995-2017)




Even though states that have completed the initial review are still obligated to notify any additions or amendments of national laws and regulations to the TRIPS Council, in practice states do not necessarily meet their reporting obligations, and states that have passed the initial TRIPS review typically stay in compliance of TRIPS.[17,18]

**Controls** In my analysis I control for alternative channels for intellectual property reform other than multilateral and bilateral channels. Past USTR targeting of countries could have resulted in trade and investment agreements with the US that include intellectual property

[17]In the regular TRIPS Council meetings held in 2021, the Chair of the TRIPS Council noted that "notifications to the Council were not keeping up with the actual development of laws and regulations relating to TRIPS" and urged member states to meet their notification obligations. See more in the TRIPS Council meeting minutes document IPCM103.pdf that can be found at https://www.wto.org/english/tratop_e/trips_e/intel6_e.htm

[18]Efforts by developed countries to strengthen enforcement of TRIPS through the TRIPS Council were met with strong resistance from developing countries, such as an EU proposal (IP/C/W/448) in 2005.

provisions, and these agreements can produce prolonged efforts to reform beyond the time period of US engagement. I include whether or not such agreements exist between a given country and the US as a control variable. The trade agreements data comes from the Design of Trade Agreements (DESTA) database (Morin and Surbeck, 2019), and includes both bilateral and multilateral trade agreements that include the given country and the US. The data on investment treaties comes from UNCTAD.

Trade linkages are likely to 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 government to meet regulatory 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 US as a share of its GDP, with export data from UNCTAD. The degree of leverage that the United States government has to seek demands with foreign countries on the issue of IP is measured by a combination of 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. The GSP data is drawn from Hafner-Burton, Mosley and Galantucci's (2018) compilation for 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.[19]

While USTR activity in intellectual property is largely driven by industry interests (Li, 2021), foreign policy factors may also influence US 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.

[19]Projects from October onwards in the current calendar year are counted towards the next calendar year.

I also control for the number of shared organizational memberships that countries have with the United States. This measure captures diplomatic capital and other forms of negotiation power that a country might have with the United States given increased opportunities of interaction through these organizations. This would affect both the likelihood of a country being targeted and also the likelihood of it complying with reforms.

I 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).[20] The economic size and income level of a country have also been shown to be strong determinants of IP protection levels (Maskus and Penubarti, 1995; Ginarte and Park, 1997; Maskus, 2000), and I use GDP and GDP per capita data from the World Bank's Worldwide Governance Indicators to account for these factors.

Lastly, I account for possible diffusion effects of legal reform 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 the World Intellectual Property Organization's WIPOLex, which is an online database of national legislation and international treaties in the field of intellectual property.

## Empirical strategy

As a first test of my hypotheses, I use two-way fixed effects (country fixed effects and year fixed effects) models that interact the measure of TRIPS compliance with the measure of bilateral engagement. The hypotheses would expect that the effect of bilateral engagement

[20]This data is available through the World Intellectual Property Organization (WIPO).

is stronger prior to countries' compliance with the TRIPS agreement: namely, the effect of bilateral engagement would be positive, but that the interaction effect between TRIPS compliance and bilateral engagement would be negative.

Next, I used the Generalized Synthetic Control (GSC) Method proposed by Xu (2017) to estimate a causal effect for the counteracting effect between multilateral regimes and bilateral regimes. The challenge with estimating a causal effect in this setting is that countries select into treatment, and the group of countries that have complied with TRIPS and been targeted by the US is not comparable with the group of countries that have not. In a difference-in-differences setting, the "parallel trends" assumption would be violated, namely the assumption that in the absence of the treatment, the average outcomes of treated and control units would be parallel with one another. Applying GSC with two-way fixed effects (country fixed effects and year fixed effects) ameliorates this concern. Each individual treatment effect on each treated unit is estimated semi-parametrically, and reweights control units using data from pretreatment periods. This approach is similar to the synthetic control method (Abadie, Diamond and Hainmueller, 2010), but generalizes the original synthetic control method to allow for multiple treated units and differential treatment timing, which corresponds to the data setting for this paper. Importantly, the treatment is allowed to "switch on and off", which corresponds to how US targeting of a given country is sporadic and occurs in some years but not others (Liu, Wang and Xu, 2022; Xu, 2017, p.60). The method is implemented by the `fect` software created by Licheng Liu, Ye Wang, Yiqing Xu, and Ziyi Liu. Model selection diagnostics reveals that the Matrix Completion model with optimal lambda of 0.001 is most suitable for the data.

Lastly, I test for the regulatory effects of purilateral agreements by using two-way fixed effects models with a triple interaction term between the measure of TRIPS compliance with the measure of bilateral engagement and with a dummy variable on the existence of plurilateral trade agreements that include intellectual property provisions. The trade agreements data comes again from the Design of Trade Agreements (DESTA) database

(Morin and Surbeck, 2019).

# 5 Findings

## Main results

Table 1 shows results from the two-way fixed effects estimation. "Targeted" is the dummy variable that records whether a country is targeted by the USTR for intellectual property rights in a given year. "TRIPS" is the dummy variable that records whether a country has complied with the WTO TRIPS agreement or not. In models (1) and (2), having been targeted by the USTR is positively associated with IP reforms in the host countries the following year. The effect of USTR targeting on IP laws is weaker and statistically insignificant in model (3) after controlling for the economic size and income level of countries. These results provide some evidence in support of the **compounding effect hypothesis**: when an average country has not complied with the multilateral TRIPS (TRIPS= 0), USTR targeting has a positive association with intellectual property reforms in a country in the following year.

The interaction effect of USTR targeting with TRIPS compliance is negative and statistically significant in models (1) and (2). The effect is weaker and statistically insignificant in model (3) after controlling for the economic size and income level of countries. These results provide some evidence supporting the **counteracting effect hypothesis**: the effect of USTR targeting on intellectual property rules is significantly weaker after an average country has complied with the multilateral TRIPS agreement. When countries have met multilateral demands, the multilateral regime diminishes the effect that bilateral channels have on regulatory convergence.

Overall, in model (2), with other variables held constant, targeting by the US increases the Gold and Morin IP index by an average of 0.41 prior to TRIPS compliance (postTRIPS= 0), and an average of 0.24 ($= 0.41 + 0.77 - 0.94$) after compliance with TRIPS (postTRIPS= 1).

Both increases are substantial for an index that ranges from 0 to 9. For countries that complied with TRIPS, unilateral targeting and bilateral engagement by the US still leads to progress on regulatory convergence, but progress is harder to come by in countries that have already adhered to the multilateral agreement.

To address the causal identification challenge that countries that have complied with TRIPS and been targeted by the US are likely not comparable with the group of countries that haven't, I use the Generalized Synthetic Control method to produce a more accurate estimate of the counteracting effect. Estimations show that the average treatment effect on the treated (ATT) is $-0.44$ ($p = 0.063$). This presents more rigorous evidence that for countries that are TRIPS compliant and targeted by the US, they are on average $-0.44$ less likely to reform their IP laws consistent with US interests than other countries. Again, the size effect is significant on the dependent variable's scale of 0 to 9.

Figure 2 plots dynamic treatment effects to display the temporal heterogeneity of treatment effects, with 95% confidence intervals and based on block-bootstraps of 1,000 times for the uncertainty estimates. This plot shows the average treatment effect on the treated (ATT) over the period of [-10, 10] years relative to treatment, and does not assume treatment effect homogeneity in doing so. Reassuringly, there are no pre-trends leading towards the onset of treatment nor significant effects in the pre-treatment period, which strengthens the assumption that there are no time varying confounders in the estimation. Further, to address the concern of over-fitting in the pre-trend, I check whether there is a treatment effect in the placebo periods [-2 years, 1 year] prior to actual treatment. As Figure A.1 in the Appendix shows, the estimated ATT in this range is not significantly different from zero (placebo test p-value= 0.329).

Finally, I examine whether the likelihood for the USTR to target individual countries regarding their intellectual property protection practices changes before and after a country complies with TRIPS. If there is a significant difference in how often the USTR is using the annual review to engage countries on their intellectual property regulations, this could

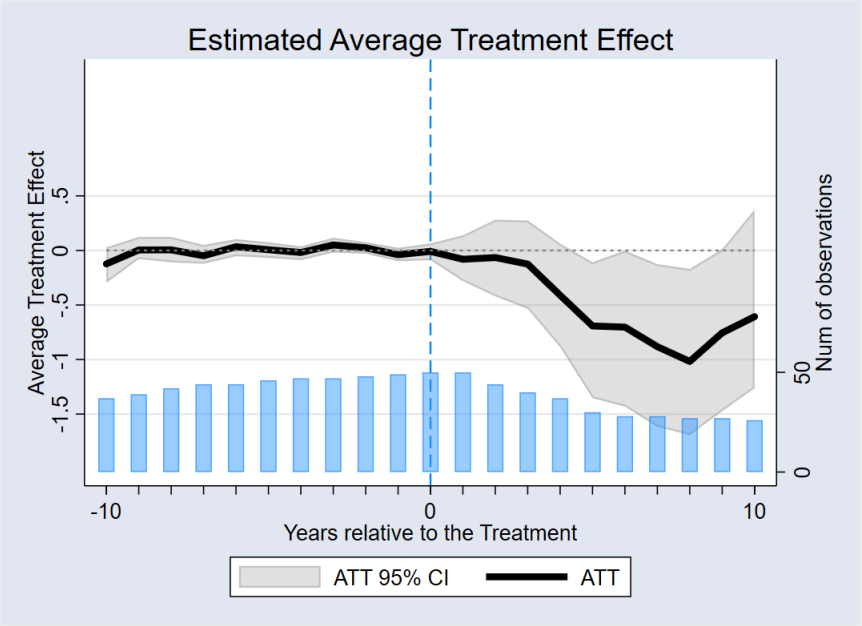
Table 1: Effect of USTR targeting on legal changes to intellectual property protection

| | *GM index* (0-9) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Targeted | 0.46* | 0.41* | 0.15 |
| | (0.23) | (0.23) | (0.18) |
| TRIPS | 0.88*** | 0.77*** | 0.51 |
| | (0.28) | (0.28) | (0.31) |
| Target×TRIPS | -1.01*** | -0.94*** | -0.38 |
| | (0.32) | (0.32) | (0.36) |
| USPTO patents (log) | | 0.16 | 0.08 |
| | | (0.14) | (0.13) |
| Bilateral agreement | 0.61* | 0.39 | 0.62* |
| | (0.35) | (0.34) | (0.34) |
| Trade dependence (log) | | 0.14* | 0.04 |
| | | (0.08) | (0.07) |
| GSP country | | -0.79*** | -0.66*** |
| | | (0.24) | (0.24) |
| Foreign aid (log) | | -0.04 | 0.04 |
| | | (0.04) | (0.07) |
| IP law diffusion | | | -0.08 |
| | | | (0.09) |
| GDP (log) | | | -5.45** |
| | | | (1.91) |
| GDP per capita (log) | | | 5.96*** |
| | | | (1.77) |
| Polity score | | | 0.04 |
| | | | (0.04) |
| Alliances (dummy) | | | -0.36 |
| | | | (0.42) |
| IGO memberships | | | 0.06 |
| | | | (0.05) |
| Constant | 0.58** | 2.43*** | 87.18*** |
| | (0.24) | (0.79) | (32.64) |
| Observations | 980 | 959 | 948 |
| R-squared | 0.57 | 0.61 | 0.66 |
| Number of countries | 59 | 58 | 58 |
| Year FE | ✓ | ✓ | ✓ |
| Country FE | ✓ | ✓ | ✓ |

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

suggest that the observed effects come from change of actions on the US side. For this analysis I use a paired t test that measures whether the frequency at which a country is

Figure 2: Dynamic Estimated Average Treatment Effects ([-10, 10] years window)




targeted by the USTR is different before and after TRIPS compliance. I find that the mean difference in targeting after TRIPS and before TRIPS is $-0.014$, and it is not statistically significant ($p > 0.68$).

## Analysis of plurilateral agreements

Analysis of plurilateral agreements provides evidence that regional trade agreements are conducive to further reform in intellectual property protection in developing countries, and has a compounding effect on regulatory convergence rather than a counteracting effect. As Table A.1 shows, regional trade agreements are positively associated with higher standards in intellectual property protection laws in a country.

Perhaps more importantly, table 2 shows evidence that the counteracting effect of USTR targeting with the WTO multilateral regime is not attributable to regional trade agreements. The model follows model (3) in table 1, but instead of including the interaction between USTR targeting and WTO TRIPS compliance, it includes a triple interaction term for whether or not a country is targeted by the USTR in a given year, whether the country has

complied with TRIPS, and whether or not it has existing regional trade agreements with the US that include IPR provisions (Target×TRIPS×Regional). Model results show that both the dummy variable for the existence of regional trade agreements, as well as the interaction term between compliance with the WTO TRIPS regime and regional trade agreements are positive and statistically significant. However, when USTR targeting also exists in an average country in a given year, the triple interactive effect is negative and statistically significant. The presence of regional trade agreements in addition to WTO TRIPS compliance tends to produce a positive compounding effect that increases the likelihood of legal changes that improve intellectual property protection, whereas the additional presence of USTR targeting significantly dampens these positive relationships.

Overall, the results suggest that demands for higher intellectual property protection that are advanced through regional agreements do not provoke the type of backlash and "counteracting" that bilateral demands do. The bilateral channel to regulatory harmonization (ie. USTR targeting) produces regulatory effects that differ from both the WTO multilateral regime and regional trade regimes. In the next section, I move to using qualitative evidence to examine the developing countries responses that might explain the quantitative results in this section.

# 6 Developing countries responses

How do developing countries resist unilateral (in this case US) demands for further intellectual property reforms in the period after they meet multilateral commitments? I argue that the TRIPS agreement serves both as a rhetorical shield to justify non-action in light of additional demands, as well as provides the legal ground that mobilizes domestic groups and non-profit groups in opposition to further reform.

Underlying developing country pushback against US demands is the fact that Section 301 sanction tools became less legitimate under the WTO. In 1995 the *Wall Street Journal*

Table 2: Triple interaction model

| | *GM index* (0-9) |
|---|---|
| Target | 0.14 |
| | (0.16) |
| TRIPS | 0.23 |
| | (0.25) |
| Target×TRIPS | -0.01 |
| | (0.27) |
| Regional agreements (dummy) | 0.97*** |
| | (0.32) |
| Target×Regional | -0.17 |
| | (0.44) |
| TRIPS×Regional | 1.49*** |
| | (0.53) |
| Target×TRIPS×Regional | -1.41** |
| | (0.64) |
| Bilateral investment treaty (dummy) | -0.10 |
| | (0.32) |
| USPTO patents (log) | 0.13 |
| | (0.12) |
| Trade dependence (log) | 0.03 |
| | (0.07) |
| GSP country | -0.49** |
| | (0.19) |
| Foreign aid (log) | 0.02 |
| | (0.06) |
| IP law diffusion | -0.09 |
| | (0.09) |
| GDP (log) | -6.99*** |
| | (1.52) |
| GDP per capita (log) | 7.67*** |
| | (1.40) |
| Polity score | 0.04 |
| | (0.04) |
| Alliances (dummy) | -0.33 |
| | (0.39) |
| IGO memberships | 0.05 |
| | (0.06) |
| Constant | 111.47*** |
| | (25.95) |
| Observations | 948 |
| Number of countries | 58 |
| R-squared | 0.70 |
| Year FE | ✓ |
| Country FE | ✓ |

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

headlined a report with "U.S. may be losing its trade bully status – WTO Levels the Playing Field For Settling Disputes" which observes that the US was losing cases in the WTO dispute forum, and can no longer unilaterally impose its trade interests as easily as before.[21] In 1998 the European Community launched a complaint of the Section 301, and twenty-one other countries joined as third parties to the dispute (Johns and Pelc, 2014). The EC lost the panel ruling, but the broad condemnation from WTO members "effectively crippled" the US' ability to use trade sanctions through Section 301 to reach its policy goals abroad (Johns and Pelc, 2014, p.672).

Developing countries invoke WTO TRIPS requirements to shield them from further IP demands. This shield is strengthened by the fact that countries' compliance with TRIPS is rarely reviewed again after they pass the initial review at the TRIPS council. In a submission by the Ministry of Trade and Industry of the Arab Republic of Egypt for the USTR 2018 Special 301 Report for example, the Ministry countered US complaints about its patent data protection rules by invoking its commitment to TRIPS obligations:

> "In this regard, it must be noted that the concept of 'Data Exclusivity' adopted by the U.S. is different from the more common concept of 'Undisclosed Information' which is adopted by Egypt, among many other countries including developed countries, in light of and in commitment to its obligations under Article 39 of the TRIPS Agreement."

The multilateral agreement is also mentioned extensively in public comment submissions made by public health groups such as Public Citizen and Médecins Sans Frontières (NSF) who argue that US demands for pharmaceutical protection far exceed that of TRIPS requirements and come at the expense of public welfare. Industry associations and business groups in developing countries also use the TRIPS framework to vocally express their dissatisfaction with US actions, such as the Indian Pharma Alliance (IPA), which is the main business association representing major domestic drug companies in India.

[21] Eduardo Lachica. October 13, 1995. "U.S. May Be Losing Its Trade-Bully Status — WTO Levels the Playing Field For Settling Disputes." *The Wall Street Journal*. Accessed via Factiva.

The debate surrounding compulsory licenses further serves to illustrate the role of the multilateral TRIPS in mobilizing domestic opposition to US demands and diminishing the strength of bilateral engagement for increasing intellectual property protection in developing countries. A compulsory license allows domestic firms to use a patent of another firm without the permission of the patent owner. Thrust at the forefront of policy debates about wider vaccine distribution during the Covid-19 pandemic,[22] the flexibility embedded in compulsory licensing rules has long been a source of contention between developing countries and developed countries that represent the interests of global pharmaceutical firms.

To comply with the TRIPS agreement, India passed a new patent law in 2005 which granted 20-year patents to newly invented drugs. The law allowed for compulsory licensing under certain circumstances, as well as adopted a relatively restrictive patenting rule for pharmaceuticals by which minor modifications of known substances would not be patentable. The law became a ground of contestation between domestic groups pushing for more access and production of cheap generic medicine, and foreign groups that wished to preserve patent rights and exclusivity of patented drugs. A public-interest organization called the Lawyers Collective filed oppositions to HIV drug patents in India, including against Novartis' attempt to patent one of its HIV drugs (Halliburton, 2017). Other groups such as the Initiative for Medicines, Access and Knowledge (I-MAK), partnered with nonprofit Indian Network of People Living with HIV/AIDS (INP+) and the Delhi Network of Positive People (DNP+) to oppose Gilead Science's patent on the grounds that it was a derivative of the known substance (Halliburton, 2017). Non-profit groups including AIDS groups representing patents in India, as well as Doctors Without Borders, brought a case to court that argued that Gilead Sciences should be prevented from patenting its antiretroviral drug Viread given that India already manufactured a generic version.[23]

[22]Nasos Koukakis. January 22, 2021. "Countries worldwide look to acquire the intellectual property rights of Covid-19 vaccine makers."

[23]Amelia Gentleman and Hari Kumar. "AIDS Groups in India Sue to Halt Patent for U.S. Drug." May 12, 2006. *The New York Times*.

The IPA, which represents prominent generic pharmaceutical producers in India, has also pushed for more use of the flexibilities in Indian patent law.[24] In 2012, the Indian government authorized a compulsory license for the first time after it had amended its patent law. The decision mandates that Bayer license its drug Nexavar to Natco Pharma, an India company. Natco will pay Bayer royalty for the license, and will be able to sell drugs in India at about a third of the price of Bayer.[25] Bayer appealed the decision within India's patent litigation system, but the decision was eventually upheld in India's Supreme Court. The Indian government also defended its decision at the WTO TRIPS Council in June 2017 by citing its TRIPS obligations:

> The Controller of Patents in India granted a compulsory license under section 84 because the TRIPS Agreement allows members to adopt measures to protect public health and Bayer did not meet its duty under the Indian Patents Act as the patented invention was not available to the public at a reasonable price, and it was not worked in the territory of India. The Indian Courts, have upheld the decision of Controller General of Patents to grant Compulsory License to NATCO Pharma to manufacture the generic version of Nexavar in India.[26]

In 2013, the IPA directly responded to Pfizer's criticisms that Section 3(d) in the Indian Patents Act undermined patent protection for innovative medicines, where Pfizer's intellectual property chief counsel Roy Waldron charged India's IP policy to be "protectionist" and "discriminatory."[27] In a letter to various Indian government bodies, Indian drug makers attacked Pfizer's approach to be stemming from its own failures to innovate and profit in the Indian market.[28]

In response to India's designation on the USTR's watch list, the IPA has directly sub-

[24]"Govt not using patent law effectively: Pharma body." March 20, 2018. *Times of India*.

[25]Vikas Bajaj and Andrew Pollack. March 12, 2012. "India Orders Bayer to License a Patented Drug."

[26]Document retrieved from https://www.keionline.org/23379.

[27]Soma Das. August 29, 2013. "Indian patent law doesn't discriminate against US companies." *The Economic Times*.

[28]Soma Das. April 30, 2014. "Pfizer Isolated in Campaign to Push US to Downgrade India." *The Economic Times - Mumbai Edition*. Accessed via Factiva. Pfizer had partnerships with three domestic Indian companies but failed in all of them.

mitted its own public comment to the USTR that argued against the case of India being included.[29] In its submission to the 2018 round that counters India's placement as a priority foreign country in the 2017 review, it argues against compulsory license being a problem by noting that statutes in many West European countries have similar or even more broader interpretations of compulsory licensing in conditions of "public interest" (Indian Pharmaceutical Alliance, 2018, p.5). It also specifically brings up TRIPS to its defense:

> "WHO, WIPO and WTO have jointly endorsed the 'freedom' of WTO members under the TRIPS agreement 'to determine the grounds upon which compulsory licenses are granted' and this freedom is 'not limited to emergencies or other urgent situations, as is sometimes mistakenly believed'. ... The statutory provision for compulsory licensing in India conforms to the TRIPS agreement and the Doha Declaration to which the U.S. is signatory. We respectfully urge the USTR to balance the apprehension of U.S.-based pharmaceutical companies of potential or possible adverse impact of compulsory licensing in India against the demonstrably legitimate and fair use of the provision while determining whether India's compulsory licensing provision results in the denial of adequate and effective protection of IPR to the U.S. pharmaceutical industry (Indian Pharmaceutical Alliance, 2018, p.6)."

# 7 Conclusion

This paper asks if multilateral and bilateral channels of regulatory pressure can produce compounding effects towards regulatory harmonization across jurisdictions. In particular, it considers how the regulatory effects of bilateral channels can be affected by multilateral regimes, and argues that compliance with multilateral regimes can constrain the policy space for bilateral engagement and unilateral demands to bring domestic regulations towards harmonization. Using quantitative data from intellectual property protection in developing countries, this paper finds that countries are less likely to meet US demands for more stringent intellectual property protection after they meet their multilateral obligations in the

[29] Aneesh Phadnis. February 11, 2017. "Drug makers seek removal from patent watch list." *Business Standard*. And "Indian Pharma Lobby seeks Removal of India from US Patent Violator List." March 7, 2019. *PharmaIP.cn*.

WTO's Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement. Further, it demonstrates that the multilateral regime can serve to justify and strengthen developing countries' opposition to meeting further demands for intellectual property reform, both because unilateral demands become less legitimate, and also because domestic groups mobilize more effectively by invoking multilateral commitments.

This paper then prompts us to consider the conditions under which global rules could be made. In an era when multilateral forums are gaining less progress due to diverse member interests and politicized processes, bilateral forums may be important for achieving further breakthroughs in areas of global governance. However, when states already adhere by a multilateral regime that has relatively strong legitimacy, multilateral endorsement may in fact strengthen domestic opposition to additional reforms and shrink the bargaining space for bilateral negotiations, which is the reverse of what Voeten (2001) finds with outside options increasing the bargaining space in multilateral forums. Similar to how forum shopping could undermine enforcement and governance in international organizations (Busch, 2007; Clark, 2022), competition among regimes to govern the same regulatory area can undermine transnational regulatory harmonization.

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# Appendix

## Morin and Gold index

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 World Intellectual Property Organization (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 be 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.

## Additional results on regional agreements

In table A.1, the number of regional trade agreements with IPR provisions that both a given country and a US are party to in a given year is included as a separate variable in the analysis. The same models are used as in Table 1, and across the 3 models, the number of regional trade agreements are positively and statistically significantly associated with changes to intellectual property law.

Table A.1: Effect of regional trade agreements on legal changes to IP

| | *GM index* (0-9) | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Targeted | 0.50** | 0.45* | 0.15 |
| | (0.23) | (0.22) | (0.16) |
| TRIPS | 0.81*** | 0.71** | 0.38 |
| | (0.27) | (0.27) | (0.29) |
| Target×TRIPS | -0.96*** | -0.91*** | -0.20 |
| | (0.30) | (0.30) | (0.31) |
| Regional agreements (number) | 0.71*** | 0.67*** | 1.11*** |
| | (0.17) | (0.17) | (0.15) |
| Bilateral investment treaty (dummy) | 0.13 | -0.12 | -0.08 |
| | (0.55) | (0.46) | (0.32) |
| USPTO patents (log) | | 0.22 | 0.15 |
| | | (0.14) | (0.12) |
| Trade dependence (log) | | 0.14* | 0.02 |
| | | (0.08) | (0.06) |
| GSP country | | -0.69*** | -0.45** |
| | | (0.24) | (0.20) |
| Foreign aid (log) | | -0.07 | 0.03 |
| | | (0.08) | (0.06) |
| IP law diffusion | | | -0.06 |
| | | | (0.09) |
| GDP (log) | | | -6.76*** |
| | | | (1.76) |
| GDP per capita (log) | | | 7.48*** |
| | | | (1.62) |
| Polity score | | | 0.04 |
| | | | (0.04) |
| Alliances (dummy) | | | -0.35 |
| | | | (0.39) |
| IGO memberships | | | 0.06 |
| | | | (0.06) |
| Constant | 0.75** | 1.99*** | 107.20*** |
| | (0.31) | (0.53) | (29.93) |
| Observations | 980 | 959 | 948 |
| R-squared | 0.59 | 0.62 | 0.70 |
| Number of iso3n | 59 | 58 | 58 |
| Year FE | ✓ | ✓ | ✓ |
| Country FE | ✓ | ✓ | ✓ |

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

## Placebo test

To test for whether or not "pretrends" exist in the data, I run a panel placebo test. According to Liu, Wang and Xu (2022), this test "hides a few periods of observations before the onset of the treatment for the treated units and use a model trained using the rest of the untreated observations to predict the untreated outcomes of those held-out periods" (p.2). If there are no unobserved factor affecting treated and untreated units differently, then the average differences between the observed and predicted outcomes should be close to zero. Figure A.1 shows that in the "placebo region" where the test is conducted, the average difference between observed and predicted outcomes is close to 0. A difference-in-means test produces a p-value of 0.329, which again indicates that the average difference between observed and predicted outcomes is not statistically different from 0.

Figure A.1: Placebo test for ATT estimation