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DO LEGAL REMEDIES PROMOTE INVESTMENT? NEW EVIDENCE FROM A NATURAL EXPERIMENT IN THE INVESTMENT TREATY NETWORK

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ABSTRACT

Many developing countries are considering curtailing legal remedies available to investors in bilateral investment treaties (BITs). This change will likely benefit developing countries by restoring a portion of their sovereign autonomy, but perhaps at the cost of a decline in foreign investment. As with any trade or investment policy, there are two primary challenges to evaluating whether and how the strength of legal remedies in a BIT affect investment: (1) studying a change in policy at the provision level requires provision-level information on a large number of BITs, and (2) investment policy is likely correlated with unobserved drivers of investment. To address the first challenge I introduce a new comprehensive database, created by me in partnership with the United Nations Conference on Trade and Development (UNCTAD), that contains provision-level information for over 2,500 BITs. I also identify a natural experiment to address the second challenge: an arbitration decision that endowed some investors with new and stronger legal remedies through an unanticipated application of the "most favored nation" principal. Using this database and natural experiment, I present robust evidence that stronger legal remedies in a BIT do not lead to more investment. I also present suggestive evidence that stronger legal remedies imposed on a host economy by an arbitration tribunal may lead to a decline in investment as host economies react to their increased exposure to arbitration and tighter constraints on their regulation of foreign capital.

CHAPTER 1

INTRODUCTION

A bilateral investment treaty (BIT) is a treaty signed by two countries that grants certain legal protections to investors from one signatory when investing in the other signatory. Common protections include protection from expropriation and a guarantee of the free transfer of assets. If a host country violates the treaty, a BIT grants investors legal remedies that often include the right to seek treaty or contract enforcement in an arbitration tribunal outside the jurisdiction of the host country.

More than 3,200 BITs have been signed since 1959, with 2,321 BITs currently in force.[1] There is mixed empirical evidence on whether BITs attract investment. There is also mounting concern among many scholars and policy makers that legal remedies in BITs impose high costs on host economies. These costs are realized through eroded domestic sovereignty caused by disputes being removed from domestic courts. Costs are also realized through higher exposure to arbitration proceedings, resulting always in attorneys fees and often in the payment of damages. These costs are exacerbated by the unpredictability of an arbitration jurisprudence marked with unexpected and sometimes contradicting interpretations of BIT protections.[2] Sixty-five new arbitration cases were initiated in 2017 bringing the total number of cases to 855.[3]

In response to an increasing exposure to arbitration proceedings, many host countries are considering limiting legal remedies in investment treaties. Some countries have recently taken decisive action. For example, India, the tenth largest recipient of FDI in 2015, was respondent to 12 arbitration disputes in 2015.[4] In July of 2016 India sent notice to 57 countries of its unilateral termination of BITs with those countries and requested an opportunity to

1. UNCTAD (2018a)
2. Franck (2005)
3. UNCTAD (2018b)
4. UNCTAD (2018b)

renegotiate those agreements. Based on the current draft of the India Model BIT, new BITs will likely include much weaker legal remedies.[5]

There is little existing empirical work on how the strength of legal remedies in a BIT affect investment flows between signatories. There are three primary challenges to credibly answering this question. The first is that one would need data on the precise content of each investment treaty, both in terms of legal remedies and other substantive protections. Having these data would enable a researcher to compare outcomes of BITS with weak versus strong legal remedies while controlling for the strength of the rest of the protections in the agreement. The second challenge is endogeneity: two countries are more likely to sign a strong BIT if the investment opportunities between the two countries are high and the protections in the treaty are relevant. The third challenge is isolating the effect of the legal remedies from the effect of the remainder of the BIT. Even if one could credibly argue that an event study centered around the entry into force of BITs was causal evidence of the effect of a BIT on attracting investment, it would be difficult to isolate the effect of legal remedies on FDI from the effect of the other protections in the BIT that are introduced concurrently with the legal remedies.

To address the data challenge I have worked in partnership with the United Nations Conference on Trade and Development (UNCTAD), managing a global team of more than 550 law student at 42 universities in 22 countries, to create a comprehensive database on the content of all BITs with publicly available text (approximately 2,500 BITs). To address the endogeneity and isolation challenges I have identified a natural experiment arising from an arbitration decision (Maffezini v. Spain) issued in January of 2000. The arbitration decision was the first to allow an investor to invoke the most favored nation (MFN) protection in its treaty to gain access to a better legal remedy in another active BIT signed by the host country. This natural experiment addresses the endogeneity concern, since the application of MFN to legal remedies was unexpected and was imposed on some origin-destination country

5. India Model BIT (2016)

pairs and not others. This natural experiment also addresses the isolation challenge, since the unexpected application of MFN was limited to only legal remedies and not other treaty protections.

Using my new database, in tandem with this unexpected arbitration decision, I am able to identify a treatment and control group of origin-destination country pairs and implement a series of difference-in-differences regressions to study how bilateral FDI responds to an unexpected improvement in the legal remedies of a BIT. I find robust evidence that stronger legal remedies introduced by Maffezini v. Spain do not cause an increase in foreign investment. I also find suggestive evidence that stronger legal remedies imposed by an arbitration tribunal on a host country may lead to a decline in foreign investment. This negative result may be explained by the following mechanism: imposing new legal remedies on a host economy may increase the implicit cost of accepting foreign capital by increasing the host economy's risk of arbitration and constraining its ability to regulate foreign capital. This price increase lowers the marginal benefit to the host economy of attracting or accepting foreign capital, leading to a decrease in its demand for foreign capital. Due to data limitations, I am not able to verify whether this is the correct mechanism, though I am able to rule out an alternative investor driven mechanism.

The paper proceeds as follows. Chapter 2 reviews the literature. Chapter 3 introduces the UNCTAD International Investment Agreements (IIA) Database, which is necessary to implement the identification strategy described in chapter 4. Chapter 4 describes the Maffezini v. Spain decision and how it acts like a natural experiment to modify the legal remedies that may be invoked under a BIT. Chapter 5 presents the empirical findings of the paper. Chapter 6 concludes.

CHAPTER 2

LITERATURE REVIEW

This project builds on an active literature on whether or not BITs affect bilateral FDI flows. Neumayer and Spess (2005), in what is recognized as one of the seminal papers on this topic, use a panel dataset of aggregate FDI inflows to 122 developing countries from 1970 to 2000 and find a positive, significant, and robust correlation between the number of BITs signed by a developing country and total FDI inflows to that country. Many empirical papers, deviating from Neumayer and Spess (2005), use bilateral rather than aggregate FDI data in variations of different gravity models of investment. Similar to Neumayer and Spess (2005), a majority of these papers find a positive correlation between BIT formulation and bilateral FDI flows (Berger et al. (2013), Tortian (2012), Tobin and Rose-Ackerman (2011), Guerin (2010), Kerner (2009), Banga (2008), Siegmann (2008) and Grosse and Trevino (2005)). Other papers find little or no effect of BITs on FDI (Peinhardt and Allee (2008), Gallagher and Birch (2006), Hallward-Driemeier (2003), Tobin and Rose-Ackerman (2003), and UNCTAD (1998)). The findings of these two sets of papers vary depending on the country pairs included in the sample and the control variables added to the model specification. Most of these papers are not able to say whether the correlation they find is the causal effect of a BIT. See UNCTAD (2014) for a more detailed summary of this empirical literature.

There are a handful of papers that attempt causal inference. For example, Busse et al. (2010) use the number of BITs signed by each country in a pair as an instrument for whether a BIT is active between the country pair. The authors find that BITs increase FDI. However, the instrumental variable they use is likely correlated with unobservables: the number of BITs signed by each country may be correlated with things like unobserved investment opportunities, the availability of investment capital in an origin economy, the production technology in an origin economy, etc. It is also possible that the exclusion restriction is not satisfied, since the signing of other BITs may increase bilateral FDI through channels outside of a BIT (i.e. new investment induced by the other BITs may introduce new production technologies, create a more skilled labor force, etc.).

Almost all papers in the empirical literature code BITs as a single indicator variable. One notable exception is Berger et al. (2012). That paper considers the content of a BIT in a single dimension: whether or not arbitration is included in the treaty. The authors find a positive correlation between FDI flows and the inclusion of an arbitration provision. They stop short of making a causal argument.

This paper makes four contributions to this literature. First, this paper introduces a new and comprehensive dataset on the content of over 2,500 BITs. Second, this paper identifies a new causal identification strategy: using an unanticipated interpretation of a treaty provision to study whether or not a particular class of protections (better legal remedies) in a BIT cause an increase in FDI. Third, this new dataset and identification strategy are combined to provide a credibly identified answer (stronger legal remedies in a BIT do not cause an increase in foreign investment) to a variation of the literature's primary research question. Finally, this paper presents suggestive evidence of a new result: imposing stronger legal remedies on a host economy may actually lead to a decline in investment.

In addition to the empirical literature on the impact of BITs on FDI, there are also a few papers that consider the factors that may motivate the formation of a BIT. Chilton (2016) presents empirical evidence that, in the context of U.S. investment treaties, political considerations, such as military aid and whether a country is a former soviet state, are better predictors of U.S. BIT formation than trends in investment opportunities. Guzman (1998) is an early paper that argues least developed countries (LDCs) may actually be harmed collectively by BITs (through an erosion of domestic sovereignty and constraints on foreign capital regulation), but LDCs are still willing to sign BITs in order to compete with other LDCs for foreign investment. The findings of this paper reinforce the findings of Chilton (2016) that BIT formation by developed economies is not motivated primarily by investment considerations, since introducing stronger protections through a natural experiment does not lead to greater investment. This same result also suggests, consistent with Guzman (1998), that BITs signed by LDCs may impose a real cost on LDCs even while they do not lead to an increase in protected FDI.

CHAPTER 3

THE UNCTAD IIA DATABASE

The UNCTAD IIA Database (the Database) contains information on the content of more than 2,500 BITs across 121 treaty provisions and their variations. This provision-level detail is necessary to study how investors may respond to changes to these provisions. This chapter begins with a summary of the sample of 1,268 treaties from the Database used in this project (i.e. the treaties that are active at the time of the Maffezini v. Spain decision). The chapter then describes the methodology used to create the Database. The chapter concludes with a detailed description of the legal remedies and their summary statistics within the sample.

3.1 The Sample

As discussed in the introduction, more than 3,200 BITs have been signed since 1959 and 2,321 BITs are currently in force. One-hundred-eighty-one countries are signatory to at least one BIT and the number of BITs signed by a single country range from zero (i.e South Sudan) to 133 (Germany).[1]

For this project I consider country pairs with an active BIT in January 2000, i.e. at the time of the Maffezini v. Spain decision. There are 1,485 BITs that fit this criteria. The number of active BITs signed by a single country in 2000 range from zero to 110 (Germany). Eight-hundred-sixty-five (58.25 percent) of these BITs are between one OECD and one non-OECD country, 528 (35.56 percent) are between two non-OECD countries, and the remaining 92 (6.2 percent) are between two OECD countries.[2] Note that, of the 193 countries with undisputed sovereignty in 2000, 29 were members of the OECD. At the time of Maffezini v. Spain, there were 4,756 country pairs with one OECD and one non-OECD

1. UNCTAD (2018a)

2. OECD membership is based on membership in 2000 and include Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.

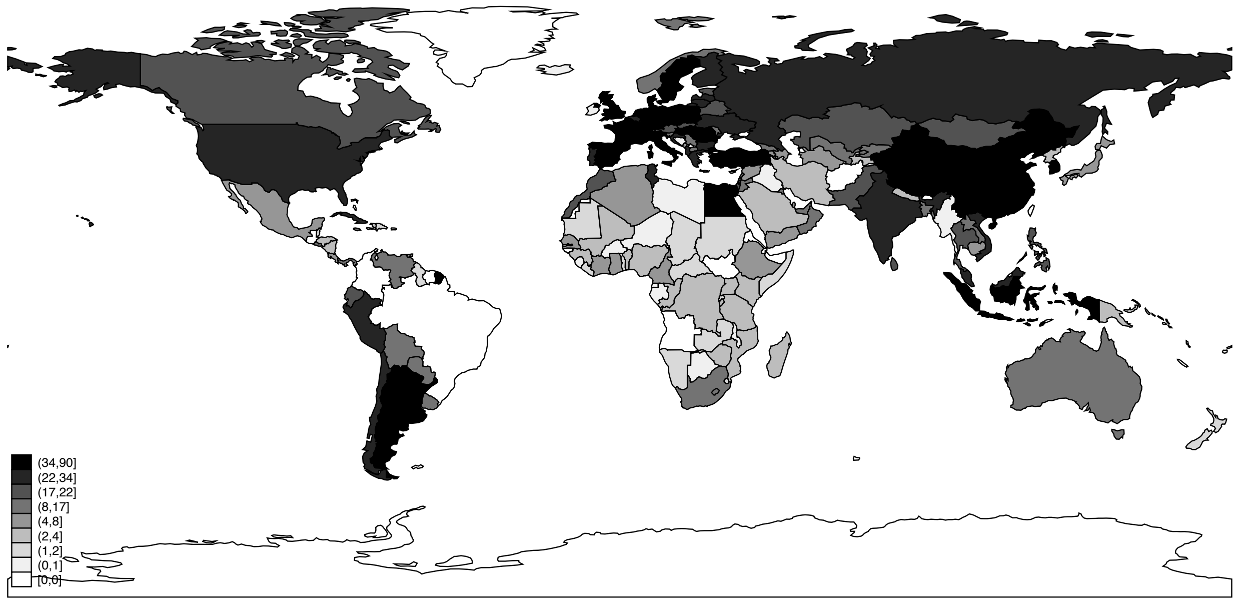

Figure 3.1: Global Density of Active BITs in 2000

country, 13,530 country pairs with two non-OECD countries, and 435 country pairs with two OECD countries. This means that 18.19 percent of country pairs with one OECD and one non-OECD country, 3.9 percent of country pairs with two non-OECD countries, and 21.15 percent of country pairs with two OECD countries had an active BIT in 2000.[3]

Of these 1,485 active BITs, 1,268 (85.4 percent) are included in the Database. The remaining 217 BITs either do not have a publicly available text or are only available in a less accessible language, i.e. a language other than English, Spanish, French, German, Portuguese, Russian, Italian or Arabic.

3.2 Coding Process

The method used to create the Database consists of two parts. The first is the method used to code the content of a BIT. The second is the method used to scale the project to cover the universe of BITs. The first part was developed internally by UNCTAD and the second part was developed by me, with technical and administrative support from UNCTAD.

3. Note that 72 of the 92 BITs between two OECD countries include at least one emerging economy (the Czech Republic, Hungary, South Korea, Mexico and Poland) that joined the OECD in the mid 1990s.

The method for cataloging the content of a BIT is recorded in a 93 page "IIA Mapping Guide". This document describes, in detail, the 121 different provisions that are coded as part of the project, complete with coding instructions and treaty text examples for each provision. Each BIT is coded independently by two readers, who then discuss and resolve disagreements in their coding.

This coding method is time intensive. During the fall of 2012, I, at the request of UNCTAD, developed a framework to scale the coding of BITs through the UNCTAD IIA University Mapping Project (the Project). From January 2013 through December 2016 I worked as lead consultant to manage the implementation of this Project. It is estimated that more than 20,000 hours were collectively spent on the creation of the Database, which was completed in January of 2017.

The Project was completed in six segments. Each segment was organized during an academic term, with the first segment being held in the winter of 2013 and the sixth segment being held in the autumn of 2016. Six sets of students, organized in teams by university, participated in the different segments. Student teams were each led by a professor, with a specialization in international investment law, at their home institution. University professors were recruited and trained by me prior to the beginning of each segment. During each segment, all students completed a training exercise in which they each mapped the same two BITs. These training BITs were also mapped by UNCTAD. I then compared each student mapping to the UNCTAD mapping to gauge accuracy of student work and provide students with feedback as part of their training.

After training, students completed three rounds of mapping. During each round I assigned each student a partner and a mapping assignment. Each mapping assignment included four unique BITs and one common BIT (the control BIT already mapped by UNCTAD). Students first completed the mapping assignment independently. Students then compared their own mapping with their partner mapping and worked together to resolve any discrepancies. I then compared a partnership mapping of the control BIT with the UNCTAD mapping. I included a mapping assignment in the Database only if a partnership achieved 95 percent accuracy on their mapping of the control BIT (i.e. matched the UNCTAD mapping of the control BIT on at least 95 percent of the provisions). Student accuracy improved over the course of each round, with approximately 50 percent of partnerships achieving 95 percent accuracy in their first mapping round and approximately 80 percent achieving 95 percent accuracy in their final mapping round. Mapping assignments that did not achieve 95 percent accuracy were mapped by a new partnership in a subsequent round. The average accuracy rate of student work included in the Database is 98.2 percent.

3.3 Legal Remedies in BITs

BITs are typically structured to perform five major functions: (1) define the entities and/or assets that will be protected (definitions), (2) articulate investor protections (protections), (3) set forth host-state obligations (obligations) (4) establish how long the protections and obligations will last (duration), and (5) specify the legal remedies, i.e. how the treaty may be enforced (legal remedies). While the structure is uniform across BITs, there is variation in the composition of provisions in each of these categories. This section provides an overview of the legal remedies in BITs. A summary of the remaining provisions is provided in Appendix A.

The legal remedies in a BIT confer rights on investors that enable them to enforce the treaty through international arbitration. These legal remedies can be boiled down to seven provisions: three baseline provisions, three limitations and one qualification. Each are considered in turn.

The first baseline provision specifies what can give rise to a claim (scope). The Database documents three variations of this provision. The first is the most broad, allowing an investor to bring a claim against a host-country for any dispute related to an investment (BIT + any). The second is more narrow, allowing an investor to bring a claim only for violations of the treaty or for other specified reasons (i.e. a dispute arising under a contract between the investor and the host country) (BIT + other). The third is the most narrow, only allowing claims for disputes arising under violations of the treaty itself (BIT only).

The second baseline provision specifies the court or tribunals before whom a claim can be brought (forum). These options typically include the International Centre for Settlement of Investment Disputes (ICSID) housed at the World Bank and/or the United Nations Commission on International Trade Law (UNCITRAL) housed at the United Nations. Other forum options may also be included, such as the Arab Investment Council or the International Chamber of Commerce (other forums). A small number of BITs list domestic courts of the host economy as the only forum available to arbitrate a dispute (domestic courts only). A handful of BITs don't list any forum options (none).

The third baseline provision specifies how different forums may interact with one another, i.e. if an investor begins a claim in a particular forum they may or may not forfeit their right to bring a later claim arising under the same breach of the treaty in a different forum (interactions). The Database documents five variations of interactions between forums. First, the treaty may explicitly preserve the right of an investor to file an arbitration proceeding even if a claim has already been brought before a domestic court (arbitration right preserved). Second, the treaty may make no reference to these interactions (none). Third, the treaty may impose a no U-turn condition, meaning that once an investor has chosen arbitration, the claim cannot be brought before a domestic court (no U-turn). Fourth, the treaty may impose a fork-in-the-road condition, meaning that an investor must choose at the outset to bring their claim either before a domestic court or before an arbitration tribunal (fork-in-the-road). Note that this variation is more restrictive than the no U-turn variation, since the no U-turn variation still allows an investor to move a dispute to arbitration after starting a domestic proceeding. Fifth, the treaty may require that a dispute first be litigated in the domestic court as a pre-condition to bringing a claim in another forum (local remedy first). The enforcement of this local remedy first requirement is the point at issue in the Maffezini v. Spain decision.

There are three limitations that a BIT may impose on the scope of legal remedies. The first limitation may only allow legal remedies for violations of a subset of the protections in the BIT (provision limit). One common iteration of this limitation only allows claims that arise under expropriation and excludes all other claims. The second limitation may exclude certain policy areas from legal remedies (i.e. if the excluded policy area is public health, an investor may not bring a claim against an action taken by the host government if that action was taken to protect the public health) (policy limit). The third limitation prevents legal remedies for a claim arising under a tax policy imposed by the host country (tax limit).

There is also a qualification that may severely limit an investor's access to legal remedies. This qualification is when a host country does not consent to arbitration in the treaty and instead requires an investor to get permission from the host country after a breach has occurred and before a claim can be brought in arbitration (consent withheld).

Of the 1,268 BITs in the sample, 1,163 BITs (91.7 percent) include legal remedies for investors. The following table summarizes the number and share of BITs in the sample that include a particular variation of each of the legal remedy provisions discussed in this section.

These data identify the precise nature of the legal remedies in each of these BITs. Note that the legal remedies in each BIT will only be modified by the Maffezini v. Spain decision if the BIT also includes a MFN provision. The MFN protection guarantees that a host government will treat protected investors at least as well as any other foreign investor. The MFN doctrine was adopted from trade agreements and historically applied to commercial policies governing investment and not to procedural protections like legal remedies.[4] Of the 1,268 BITs in the Database that were active in 2000, 1,245 (98.2 percent) include MFN protection.

4. The historical context of the MFN doctrine prior to Maffezini v. Spain is discussed in more detail in Chapter 4.

Table 3.1: Legal Remedies in Active BITs in 2000

Provision		BIT count	BIT share	cum. share
scope:	BIT + any	898	70.82	70.82
	BIT + other	43	3.39	74.21
	BIT only	222	17.49	91.72
	no legal remedies	105	8.28	100.00
forum:	ICSID + UNCITRAL	540	42.59	42.59
	ICSID or UNCITRAL	575	45.35	87.94
	other only	25	1.97	89.91
	domestic courts only	14	1.10	91.01
	none	9	0.71	91.72
	no legal remedies	105	8.28	100.00
interaction:	arbitration right preserved	42	3.31	3.31
	none	805	63.49	66.80
	no U-turn	35	2.76	69.56
	fork-in-the-road	218	17.19	86.75
	local remedy first	63	4.97	91.72
	no legal remedies	105	8.28	100.00
provision limit:	legal remedies w/ limit	105	8.28	8.28
	legal remedies w/out limit	1058	83.44	91.72
	no legal remedies	105	8.28	100.00
policy limit:	legal remedies w/ limit	21	1.65	1.65
	legal remedies w/out limit	1142	90.06	91.72
	no legal remedies	105	8.28	100.00
tax limit:	legal remedies w/ limit	27	2.13	2.13
	legal remedies w/out limit	1136	89.59	91.72
	no legal remedies	105	8.28	100.00
consent withheld:	legal remedies w/out consent	76	5.99	5.99
	legal remedies w/ consent	1087	85.73	91.72
	no legal remedies	105	8.28	100.00

CHAPTER 4
IDENTIFICATION

This Chapter describes how I employ the Database to identify origin-destination country pairs endowed with new and stronger legal remedies through the Maffezini v. Spain decision.

4.1 Maffezini v. Spain

In 1997 an Argentine investor, Emilio Agustin Maffezini, filed an arbitration claim at the ICSID against Spain under the Argentina-Spain BIT signed in 1991. According to the BIT, Maffezini was required to first fully litigate his claim in Spanish Courts before a claim could be brought before an arbitration tribunal (local remedy first).[1] Maffezini cited two facts:

1. Spain had signed a BIT with Chile that did not include the local remedy first condition.

2. The Argentina-Spain BIT included MFN protection.

Maffezini then argued that the MFN protection in the Argentina-Spain BIT allowed him to invoke the better legal remedy in the Chile-Spain BIT to avoid litigating first in Spanish courts. Argentina argued that access to different procedural remedies did not constitute "treatment" by a host economy under MFN and so MFN could not be used to circumvent the domestic court requirement. In its 2000 decision, the panel of three arbitrators unanimously agreed with Maffezini, thus allowing the claim to move forward.[2]

As discussed briefly in the previous chapter, the MFN doctrine originated in trade agreements and historically applied to commercial policies like tariffs and market access.[3] Prior to Maffezini v. Spain it was generally understood by policy makers that MFN treatment in the context of investment treaties was limited in scope to similar commercial policies like

1. Argentina Spain BIT (1991)

2. Maffezini v. Spain (2000)

3. See, for example, Hornbeck (1909), discussing MFN provisions in 18th and 19th century trade agreements.

taxes, subsidies, and regulatory takings and did not extend to legal remedies like access to arbitration.[4] After Maffezini v. Spain, investors entitled to MFN treatment now had legal precedent to invoke any legal remedy in any active investment treaty signed by the host country, rather than relying exclusively on the legal remedies in the treaty with the investor's home country. Thus, protected investors now have access to (weakly) better legal remedies.

4.2 Subsequent case law

It is worth mentioning two points here: (1) there is no formal concept of stare decisis in international arbitration, and (2) subsequent arbitration decisions are divided on whether or not MFN protection encompasses legal remedies in BITs. Each of these considerations are discussed below.

4.2.1 Stare decisis in international investment arbitration

Although there is no formal principal of stare decisis in international investment arbitration, arbitrators still reference, and partly rely on, prior investment arbitration decisions. A general consensus among arbitrators on this principal is articulated by the tribunal in El Paso v. Argentina (2006):

> ICSID arbitral tribunals are established ad hoc... and the present Tribunal knows of no provision... establishing an obligation of stare decisis. It is nonetheless a reasonable assumption that international arbitral tribunals, notably those established within the ICSID system, will generally take account of the precedents established by other arbitration organs, especially those set by other international tribunals.

4. Vesel (2007)

A survey and discussion of the practice of stare decisis in international investment arbitration is presented in Kaufmann-Kohler (2007).[5]

4.2.2 Division in case law

In addition to the stare decisis consideration, there is also a division in subsequent case law on whether or not the MFN provision can be used to invoke a better legal remedy in a different BIT. For example, Siemens v. Argentina (2004), Gas Natural v. Argentina (2005) and Suez v. Argentina (2006), all follow the Maffezini decision when answering similar questions regarding MFN treatment and legal remedies. By contrast, Salini v. Jordan (2004), Plama v. Bulgaria (2005) and Telenor v. Hungary (2006) do not allow the claimants to use their MFN protection to incorporate a stronger legal remedy into their respective treaties. Paparinskis (2011) presents a legal theory reconciling these cases, distinguishing the latter from the former by arguing the latter cases attempt to use MFN to establish jurisdiction of the tribunal while the former cases use MFN treatment to invoke a better legal remedy only after jurisdiction has been established.

Even after acknowledging this divergence in the case law, it is possible to argue, at a minimum, that Maffezini v. Spain presents to investors a plausible winning argument to persuade an arbitration panel to allow an investor to use MFN to invoke stronger legal remedies in other BITs. Note also that, according to the rules of both ICSID and UNCITRAL, nothing precludes an investor from selecting arbitrators that have previously upheld a more generous application of MFN treatment.

4.3 Identifying treatment and control groups

Maffezini v. Spain presents an opportunity to study whether protected foreign investment increases in response to an unexpected endowment of stronger legal remedies. I can identify a

5. See also Guillaume (2011) presenting similar findings.

treatment group: the set of origin and destination pairs endowed with at least one new legal remedy by Maffezini v. Spain; and a control group: the set of origin and destination pairs with an active BIT that experience no change to their legal remedies. I can also construct various measures of treatment for each dyad. These treatment measures include a simple indicator variable, a normalized count variable that counts the number of provisions that adopt a stronger variation, and other more nuanced (and subjective) measures of treatment. I can use these treatment measures to run difference-in-differences regressions, discussed in detail in Chapter 5. The remainder of this section describes how I identify the treatment and control groups. The various methods of measuring treatment are developed in Appendix B.

Treatment by Maffezini v. Spain is determined by two conditions. The first is whether a BIT between an origin and destination pair includes an MFN provision. The second is whether the host economy has at least one other active BIT that includes one or more stronger legal remedies relative to the BIT governing the country pair. Satisfying the MFN condition can be observed directly in the UNCTAD IIA Database. Satisfying the better legal remedy condition can be observed by constructing a treaty network for each host economy as described below.

First, it is straight forward to construct an ordinal ranking of the different variations of the legal remedy provisions. Recall, for example, that there are three variations of the scope provision: (1) BIT + any, (2) BIT + other, and (3) BIT only. BIT + any is more comprehensive than BIT + other, which is more comprehensive than BIT only. As a result, I can ordinally rank these variations using rankings A, B and C, where A is the most favorable variation for an investor and C is the least favorable.

Next, I construct a treaty network for each country when acting as a host economy. Consider a simple example in which a country has signed four investment treaties. Table 4.1 presents this hypothetical example and documents the rank of the variation of each legal remedy provision in each of the four treaties. Table 4.1 also documents the rank of the best variation of each legal remedy across all active treaties signed by the host economy (bold text). Note that an investor may now invoke this best variation through its MFN protection after the Maffezini v. Spain decision.

Table 4.1: Identifying Treatment by Maffezini v. Spain

	Treaty 1	Treaty 2	Treaty 3	Treaty 4
Scope (X_1)	A	B	B	C
	A	**A**	**A**	**A**
Forum (X_2)	C	C	C	B
	B	**B**	**B**	**B**
Forum Interaction (X_3)	D	C	C	B
	B	**B**	**B**	**B**
Limit on provisions (L_1)	A	A	A	A
	A	**A**	**A**	**A**
Limit on policy (L_2)	B	B	B	B
	B	**B**	**B**	**B**
Limit on tax (L_3)	B	B	B	A
	A	**A**	**A**	**A**
Consent withheld (Q_1)	A	B	A	A
	A	**A**	**A**	**A**

Conditional on each of the four BITs including a MFN clause, the ordinal rank of each provision is uniform across the treaties after Maffezini v. Spain, where all provisions now take on the highest ordinal rank in the set of treaties. As a result, the set of legal remedies is now the same for all four treaties. Note that all four BITs may be treated by Maffezini v. Spain, even if a single BIT is most favorable across a majority of provisions. This is because this most protective treaty may still incorporate a stronger remedy from a relatively weaker treaty. For example, in Table 4.1, Treaty 4 has the strongest ordinal rank across the treaty network for all but one of the provisions (scope). After Maffezini v. Spain, the scope has increased from an ordinal rank of C to A, thus expanding the legal remedies available in Treaty 4.

Using this methodology I can divide the 2,536 origin-destination dyads (governed by the 1,268 BITs in the Database that were active in 2000) into treatment and control groups. This method results in a control group of 342 dyads (13.5 percent) and a treatment group of 2,194 dyads (86.5 percent). Within the control group, 44 dyads avoid treatment by not including MFN in their active BIT, 296 dyads avoid treatment by not realizing a change in legal remedies, and 2 dyads avoid treatment by failing both conditions.

CHAPTER 5

EMPIRICAL FINDINGS

This chapter is divided into five sections: (1) primary finding, (2) refining the coefficient estimate, (3) corroborating the parallel trends assumption, (4) robustness checks, and (5) exploring mechanisms. The first section, using a binary treatment measure, presents the primary finding of this paper that, on average, introducing new legal remedies into an investment treaty does not lead to an increase in protected bilateral investment. The second section, using both a discrete and a continuous measure of treatment, presents suggestive evidence that imposing new legal remedies on a host economy may actually lead to a decline in protected bilateral investment. The third section presents evidence that the parallel trends assumption in the difference-in-differences model specification is satisfied. The fourth section demonstrates that the negative result is fairly robust to various considerations.

The final section explores two possible mechanisms that may be able to explain the negative result. The first is that the relative decline in investment is driven by investor uncertainty regarding whether or not investment treaties will be terminated and renegotiated in response to the Maffezini v. Spain decision. This mechanism fails to explain the result. The second mechanism is that, holding all else equal, host countries prefer to host investments from source countries protected by weaker legal remedies, since the risk of arbitration is lower and the host country has more latitude to regulate these investments. After Maffezini v. Spain this preference is eliminated, since legal remedies are now homogeneous across investors, thus leading to a relative decline in protected investment to host economies in treated dyads. Due to data limitations, I am not able to adequately test this particular mechanism. However, the intuition and predictions of this mechanism are consistent with the negative finding as well as the broad trend of convergence in bilateral FDI between treated and control dyads in the raw empirical data.

5.1 Primary finding

With treatment and control groups precisely defined I can now implement a difference-in-differences regression to study how foreign investors and host economies respond to an unexpected increase in the strength of legal remedies in a BIT. This section begins with a short description of the data and an introduction to the difference-in-differences model specification. The section then presents the primary empirical finding of the paper: introducing new legal remedies into an investment treaty does not lead to an increase in protected investment.

5.1.1 Data

The dataset is a panel from 1990 to 2014 for 2,527 origin-destination dyads that have an active BIT in 2000 that is included in the UNCTAD IIA Database.[1] The outcome variable of interest is bilateral FDI flows, available in an internal database maintained by UNCTAD. The independent variable of interest is treatment by Maffezini v. Spain, where treatment is binary. Standard control variables from the trade and investment flows literatures include: GDP, distance between countries, common border, common language, prior colonial affiliation, common currency, the existence of a free trade agreement (FTA), General Agreement on Tariffs and Trade (GATT) membership, common market, and common customs union. These data are available in a public database maintained by CEPII.[2] I also control for the existence of an active BIT, also available in the UNCTAD IIA Database.

1. Due to data limitations in other data sources, 9 of the 2,536 original dyads in the sample are not included in the panel.

2. CEPII (2016)

5.1.2 Model

I use the following difference-in-differences model specification:

$$FDI_{ijt} = \exp\left[\beta_0 + \beta_1 \times (Treat_{ij} \times Post_t) + \alpha' X_{ijt} + \gamma_{ij} + \delta_{it} + \psi_{jt}\right] \times \epsilon_{ijt} \tag{5.1}$$

where FDI_{ijt} is the investment flow from i to j in year t, $Treat_{ij}$ is an indicator variable equal to 1 if dyad ij is treated by Maffezini v. Spain, $Post_t$ is an indicator variable equal to 1 if year t is after Maffezini v. Spain (i.e. $t > 1999$), X_{ijt} is a vector of standard control variables from the trade and investment literatures between dyad ij in year t, and γ_{ij}, δ_{it} and ψ_{jt} control for origin-destination, origin-year, and destination-year fixed effects, respectively. Note that, after controlling for the fixed effects, the standard control variables from the trade literature that are left are indicator variables for the following preferential relationships: (1) an active BIT,[3] (2) an active FTA, (3) a common market, (4) a common customs union, and (5) whether both countries in a dyad are members of the GATT.

There are three things to note about this model specification. First, recall that the standard difference-in-differences model specification also includes independent $Treat_{ij}$ and $Post_t$ terms. However, the $Treat_{ij}$ term is soaked up by the γ_{ij} fixed effect and $Post_t$ is soaked up by the δ_{it} and ψ_{jt} fixed effects. Second, including γ_{ij}, δ_{it}, and ψ_{jt} fixed effects is standard best practice in the trade literature. These fixed effects control for multilateral resistance terms (i.e. the barriers to investment that each country faces within each of its origin and destination dyads), and thus lead to a correctly specified model.[4] Third, 76 percent of the observations in the panel dataset report zero bilateral FDI flows. This means that running a regression on a log-linearized version of the above model specification will drop

3. Recall the sample consists only of dyads that have an active BIT in 2000. As a result, the indicator for an active BIT will equal 1 for all observations that occur after 1999. For dyads with a BIT that enters into force prior to 1991, the BIT indicator will equal 1 across the panel.

4. See Baldwin and Taglioni (2006) for a careful discussion of correct model specifications in gravity models.

a lot of observations and perhaps bias my estimates. To address this issue, I implement all regressions using Poisson-Pseudo-Maximum-Likelihood estimation, a standard best practice in structural gravity models.[5]

5.1.3 Primary finding

Table 5.1 presents the baseline regression results. Column 1 presents coefficient estimates using a simple (incorrectly specified) difference in differences model with no control variables. Columns 2, 3 and 4 gradually add in controls to build up to the correct model specification reported in column 5. This is done to document the evolution of the coefficient estimates as controls and fixed effects are added to the model.

Table 5.1: Baseline Results: Treatment as an indicator, Annual Data, All Dyads

	(1)	(2)	(3)	(4)	(5)
treat × post	-0.73**	-0.63**	-0.70***	-0.10	-0.095
	(0.23)	(0.23)	(0.21)	(0.22)	(0.20)
treat	1.26**	0.55	0.86*	0.27	
	(0.44)	(0.42)	(0.37)	(0.36)	
post	2.38***	0.85***	1.70***		
	(0.20)	(0.22)	(0.51)		
orig, dest GDP		x	x		
dyad traits		x	x	x	
market integration		x	x	x	x
orig, dest, year FE			x		
orig-year, dest-year FE				x	x
orig-dest FE					x
Observations	62425	60441	50658	34141	27369
R^2	0.006	0.108	0.424	0.670	0.850

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dyad traits: distance, common border, common language, prior colonial affiliation, and common currency

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

The first three columns report negative and statistically significant coefficient estimates

5. See Silva & Tenreyro (2006). Note that the fixed effects estimation in my model specification is implemented using a new structural gravity ppml command introduced in Zylkin (2017).

for the treatment variable ($TREAT \times POST$). Controlling for origin-year and destination-year fixed effects in column 4 reduces the size of the negative coefficient, which is no longer statistically different than zero. Column 5 reports the coefficient estimate using the correct model specification, which is also small and not statistically different than zero. These initial results provide evidence of the primary finding of this paper: imposing stronger legal remedies on a host economy through an unanticipated application of the MFN treatment does not lead to an increase in investment from protected investors.

5.2 Refining the coefficient estimate

In this section I explore the robustness of my preliminary coefficient estimate along three dimensions: (1) using a discrete or continuous measure of treatment instead of a binary measure of treatment, (2) estimating coefficients using a subset of the data that excludes dyads with no prior history of FDI, and (3) summing FDI flows over three-year increments to smooth over the lumpy nature of investment decisions of firms. Each of these dimensions are discussed below. To summarize, each dimension, when adjusted, introduces and/or amplifies a negative effect of treatment on FDI flows. The robustness of this finding is explored in section 5.4. Possible mechanisms that may be driving this result are considered in section 5.5.

5.2.1 Alternative treatment measures

The baseline results in Table 5.1 are estimated by classifying treatment as a binary variable. An alternative to this classification is to quantify the amount of treatment imposed on each dyad, i.e. measuring treatment as either a discrete or continuous variable bounded by zero and one. This subsection uses two such measures of treatment. The first simply counts how many of the seven legal remedy provisions, outlined in Chapter 3, are treated and divides by seven so that treatment is bounded by 0 and 1. The second measure, starting with the

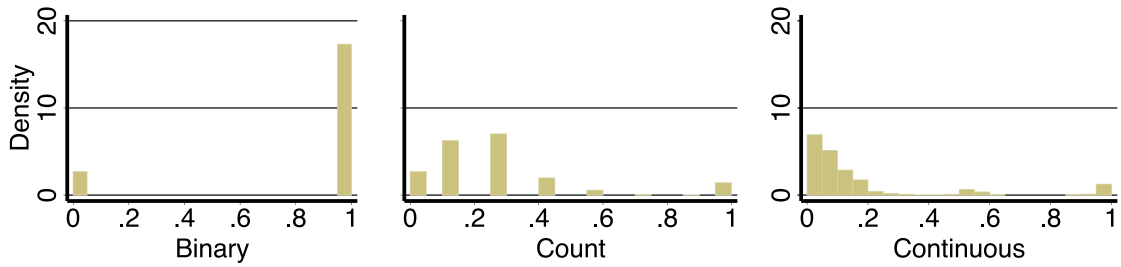

Figure 5.1: Comparing Distributions of Different Measures of Treatment

ordinal structure described in section 4.3, takes into account the magnitude of the change in each provision, assigns scores to these changes, and imposes a functional form to create a continuous treatment measure bounded by 0 and 1. This measure is presented here and the precise method used to calculate this measure (and four similar measures, based on different assumptions and used for robustness checks) is described in detail in Appendix B.

Figure 5.1 plots the distributions of the initial binary treatment measure, the count measure and the continuous measure. By construction, the binary treatment distribution is bi-modal at zero and one. Note that the count measure distribution is more spread out with most dyads receiving treatment on fewer than half of the provisions. The continuous measure distribution is even more skewed with most dyads having treatment measures between 0 and 0.2 and a number of dyads having higher treatment measures in the right tail of the distribution. Variation in treatment in the count and continuous measures are more likely to capture actual exposure to treatment relative to the binary measure, since these alternative measures are able to distinguish between small and large changes in the legal remedies available to investors.

Table 5.2 presents coefficient estimates obtained using these more nuanced measures of treatment and compares them to the baseline estimates I obtained using the binary measure. Note that Table 5.2 only presents estimates using the two model specifications that control for some variation of multilateral resistance terms, i.e. the model specifications used in columns 4 and 5 in Table 5.1.

Both of these more nuanced measures of treatment produce coefficient estimates that are

Table 5.2: Comparing Treatment Measures (Annual Data, All Dyads)

	(1) Indicator	(2) Count	(3) Cont. 1	(4) Indicator	(5) Count	(6) Cont. 1
treat × post	-0.10	-0.58^{+}	-0.21	-0.095	-0.49	-0.33
	(0.22)	(0.33)	(0.30)	(0.20)	(0.31)	(0.25)
treat	0.27	0.39	0.41^{+}			
	(0.36)	(0.33)	(0.24)			
dyad traits	x	x	x			
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE				x	x	x
Observations	34141	34141	34141	27369	27369	27369
R^2	0.670	0.668	0.670	0.850	0.850	0.850

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dyad traits: distance, common border, common language, prior colonial affiliation, and common currency

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

larger in magnitude relative to the coefficient estimate from the binary treatment measure. The estimate in column 2 using the count measure of treatment and controlling for origin-year and destination-year (but not origin-destination) fixed effects is statistically significant at the 90 percent level. These results suggest that, after I account for different levels of treatment, imposing new legal remedies on a host economy may actually lead to a decline in protected investment.

There are two additional considerations when estimating these coefficients: (1) whether coefficient estimates are different if dyads with no prior history of bilateral FDI are excluded from the regression, and (2) the lumpy nature of investment. These considerations are explored in the following two subsections.

5.2.2 Conditioning on prior investment

The current coefficient estimates are finding the average treatment effect for all dyads. These preliminary estimates are suggesting a possible negative effect of treatment, i.e. protected bilateral investment flows to host countries in treated dyads are growing at a slower rate relative to protected bilateral investment flows to host countries in dyads in the control group. Note that there are two possible countervailing effects from including dyads with no prior FDI that may be affecting these estimates. First, dyads with no bilateral FDI prior to Maffezini v. Spain and some bilateral FDI after will show large FDI growth in percentage terms. If the number of these dyads in the control group is large relative to the treatment group, the negative coefficient estimates may be driven in part by this imbalance. Alternatively, dyads with no bilateral FDI both prior to and after Maffezini v. Spain will show no FDI growth. If the number of these dyads in the treatment group is large relative to the control group, the negative coefficient may actually be dampened by this imbalance.

To address this concern I rerun the same regressions in Table 5.2 using a subset of dyads that excludes all dyads with no history of bilateral FDI prior to Maffezini v. Spain. This trimmed dataset includes 762 of the original 2,527 dyads (30 percent); of these 762 dyads, 671 (88 percent) are in the treatment group and 91 (12 percent) are in the control group.[6] These results, reported in Table 5.3, indicate that the negative effect of treatment is actually even more pronounced when I limit the sample to only include dyads with a history of bilateral FDI. This change in the coefficient estimates indicates that dyads in the treatment group with no bilateral FDI before and after Maffezini v. Spain are actually dampening the estimated effect of treatment for dyads that have a prior history of bilateral FDI.

5.2.3 Smoothing investment flows over three-year increments

One final consideration is whether and how the lumpy/volatile nature of investment decisions of firms may affect the coefficient estimates. Note that foreign firms may not choose to make investments every year and some dyads may only realize investment in-flows from one or a handful of firms. The volatility of these investments may increase the size of the standard errors, and large changes in bilateral FDI flows year-to-year may amplify the magnitude of

6. These proportions are comparable to the proportions in the original sample, where 13.5 percent of the sample was in the control group and 86.5 percent was in the treatment group.

Table 5.3: Excluding Dyads with no Prior FDI (Annual)

	(1) Indicator	(2) Count	(3) Cont. 1	(4) Indicator	(5) Count	(6) Cont. 1
treat × post	-0.24	-0.89**	-0.41	-0.037	-0.68*	-0.46+
	(0.19)	(0.33)	(0.26)	(0.20)	(0.31)	(0.24)
treat	0.25	0.47	0.28			
	(0.31)	(0.32)	(0.25)			
dyad traits	x	x	x			
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE				x	x	x
Observations	14546	14546	14546	14546	14546	14546
R^2	0.777	0.778	0.776	0.888	0.888	0.888

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dyad traits: distance, common border, common language, prior colonial affiliation, and common currency

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

the estimated effect of treatment. To address this concern I sum bilateral FDI flows across three-year increments (1991-1993, 1994-1996, etc.) and then rerun the same set of regressions on this new three-year-increment dataset. These regressions are implemented using both the full sample and the sample that excludes dyads with no prior FDI. The coefficient estimates from these new regressions are reported in Tables 5.4 and 5.5, respectively.

Recall that, in the initial annual dataset with all dyads, 76 percent of the observations reported zero bilateral FDI flows. Summing over three-year increments reduces the share of zero observations slightly to 70 percent. Excluding dyads with no prior FDI from the three-year increment data substantially reduces the share of zero observations to 36 percent.

As documented in Table 5.4, similar to the effect of excluding dyads with no prior FDI, summing the data over three-year increments to smooth out investment also increases the size and the statistical significance of the coefficient estimates. As documented in Table 5.5, when the data is both summed over three-year increments and trimmed to exclude dyads with no prior FDI, the effect is even more pronounced. Note that, although summing over three-year increments will decrease volatility (and thus the standard errors), the dataset

Table 5.4: Summing Over 3 Year Intervals (all dyads)

	(1)	(2)	(3)	(4)	(5)	(6)
	Indicator	Count	Cont. 1	Indicator	Count	Cont. 1
treat × post	-0.15	-0.73*	-0.29	-0.056	-0.74*	-0.49+
	(0.24)	(0.36)	(0.34)	(0.22)	(0.34)	(0.28)
treat	0.26	0.45	0.46+			
	(0.38)	(0.34)	(0.25)			
dyad traits	x	x	x			
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE				x	x	x
Observations	12652	12652	12652	9754	9754	9754
R^2	0.707	0.704	0.707	0.916	0.916	0.916

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dyad traits: distance, common border, common language, prior colonial affiliation, and common currency

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

Table 5.5: Summing Over 3 Year Intervals (dyads with prior FDI)

	(1)	(2)	(3)	(4)	(5)	(6)
	Indicator	Count	Cont. 1	Indicator	Count	Cont. 1
treat × post	-0.23	-1.01**	-0.43	0.034	-0.87*	-0.57*
	(0.37)	(0.36)	(0.29)	(0.22)	(0.34)	(0.27)
treat	0.21	0.52+	0.33			
	(0.34)	(0.28)	(0.22)			
dyad traits	x	x	x			
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE				x	x	x
Observations	5190	5190	5190	5182	5182	5182
R^2	0.808	0.809	0.806	0.925	0.926	0.926

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Dyad traits: distance, common border, common language, prior colonial affiliation, and common currency

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT also now has fewer observations, which will increase the standard errors. The net effect is approximately zero, since standard error estimates are largely unchanged.

The coefficient estimates in this subsection collectively provide suggestive evidence of the second finding of this paper: imposing stronger legal remedies on a host economy may lead to a decline in protected investment. Possible mechanisms that may be driving this result are explored in section 5.5. To give some idea of the magnitude of the negative effect of treatment, consider the coefficient estimate of -0.57 in column 6 of Table 5.5. Note that one standard deviation in the treatment distribution is approximately 0.25. Taking the estimate at face value implies that exposure to treatment by the Maffezini v. Spain decision equal to one standard deviation in the treatment distribution, will, on average, cause a 14 percent decline in foreign investment.

5.3 Corroborating the parallel trends assumption

Coefficient estimates recovered using difference-in-differences as an identification strategy assume that the differences in the outcome variable between the treatment and control groups are constant prior to treatment and would have continued to be constant in the post period in the absence of treatment. This is the primary identifying assumption necessary to make a causal inference. There are two common approaches to corroborate this assumption. The first is to do a raw plot of the trends and check whether they are parallel prior to treatment. The second is to create a coefficient event study to see if there is a pre-trend in differences in the outcome variable prior to treatment. Each are discussed below.

5.3.1 Plotting the trends

One common approach to corroborate the parallel trends assumption in the context of log-linearization in an ordinary least squares model is to plot the mean of the log of the outcome variable for both the treatment and control group across the panel and then look to see if the trends prior to treatment are parallel across these groups. In a context, like this project, with a large number of zero observations in the outcome variable, simply plotting the mean of the log will not accurately capture the trends in the outcome variable, since taking logs will drop a large share of the observations.

One alternative is to use my 3 year dataset to plot trends on the log of FDI for both the treatment and control group for different snapshots of the FDI distributions (i.e. the median, the 60th percentile, etc., instead of the mean). Figure 5.2 presents six different snapshots of the distribution for the treatment and control groups at the 50th, 60th, 65th, 75th, 90th and 95th percentiles.[7]

These snapshots of the trends in the distributions provide approximate evidence of parallel trends prior to treatment and a common trend pattern across the treatment and control distributions: for each of the percentiles, the treatment group always starts with higher FDI, realizes a decline in FDI after treatment, and FDI approximately converges to the same amount of FDI for the control group after treatment. Note that this consistent pattern of FDI increasing (after treatment) at a faster rate in the control group relative to the treatment group *across the distribution* is also suggestive evidence that the negative coefficient estimate is not being driven by outliers.[8]

5.3.2 Coefficient event study

Note that the raw plots in Figure 5.2 do not control for any covariates and simply plot the raw trends of the treatment and control groups. Another common approach to corroborate the parallel trends assumption that does control for covariates is to create an event study which checks whether or not the coefficient estimates are capturing a pre-trend decline in

7. Note that the 50th, 60th and 65th percentile values of bilateral FDI flows in one or both of the distributions in 1993 is zero, resulting in the missing data points in the first three graphs.

8. Note that one standard way to check whether a coefficient estimate is driven by outliers is to create a bin-scatter plot in Stata. Unfortunately, the bin-scatter command is built around the OLS regression, which, again, means I would need to first take the log of FDI. Doing so will drop almost 40 percent of my observations in the 3-year-increment dataset, which may bias the estimates in the bin-scatter plot.

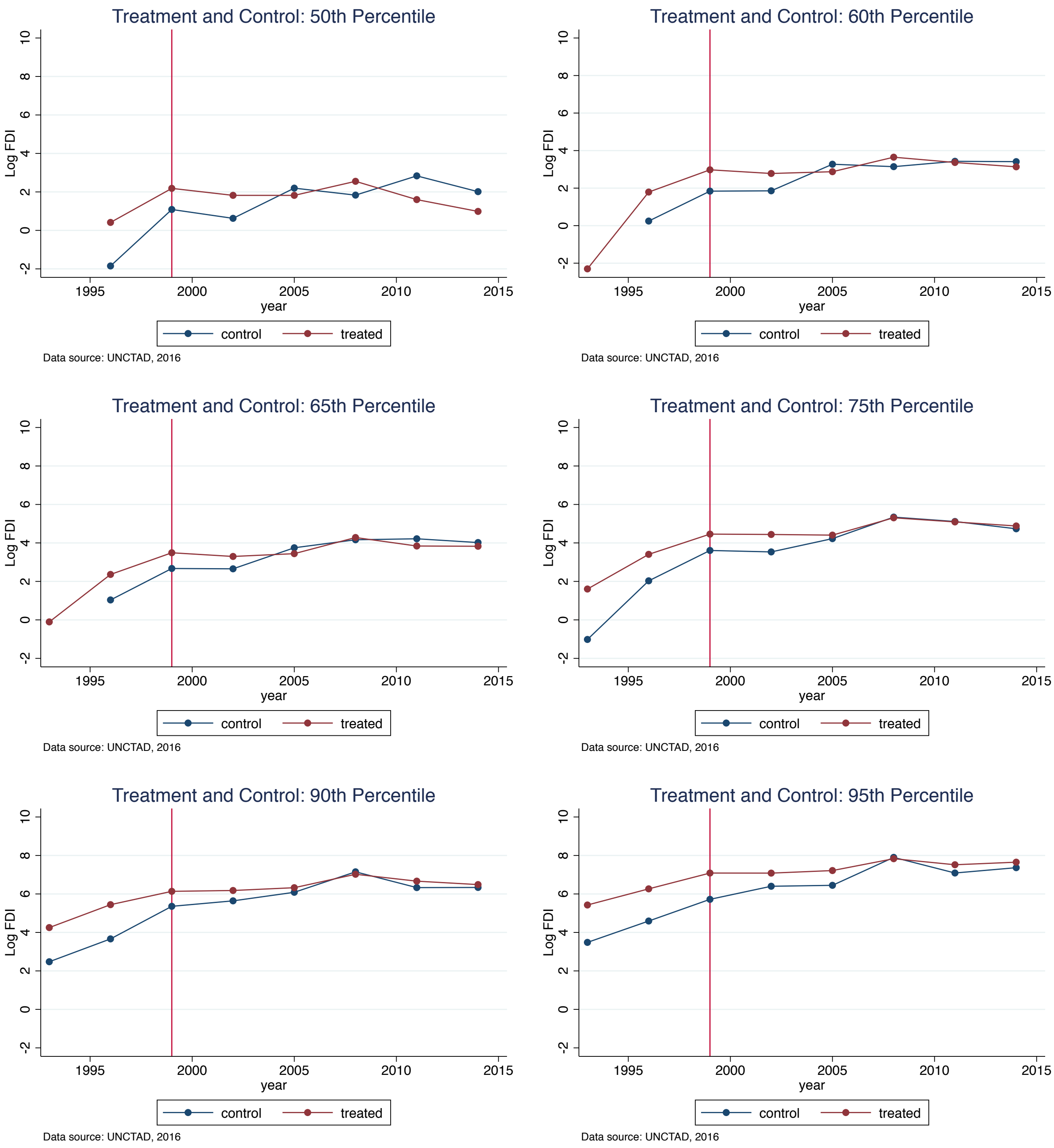

Figure 5.2: Verifying a Parallel Pre-Trend

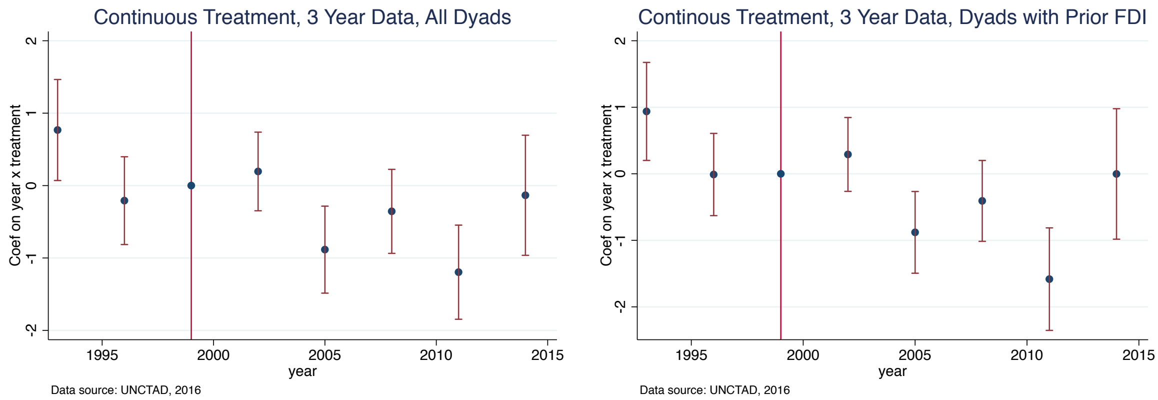

Figure 5.3: Coefficients Event Study

FDI in treated dyads. To do this I run the difference-in-differences regression of bilateral FDI on a series of treatment variables interacted with year dummies and then plot the coefficients of the interacted terms. Two such event studies are presented below, estimated using the correct model specification (with origin-year, destination-year and origin-destination fixed effects), the primary continuous measure of treatment and three-year-increment data. The first event study includes all dyads and the second includes only dyads with prior FDI.

These event studies collectively corroborate the parallel trends assumption, though with two qualifications. The first is that the coefficient estimate for treatment interacted with the year 1993 is positive and statistically significant, which suggests a potential pre-trend difference between treatment and control groups. One possible explanation, that is consistent with the evidence in Figure 5.2, is that treated dyads have a larger share of observations with positive FDI compared to control dyads, relative to the share difference in the actual treatment year, 2001. This difference in the share of zero observations that is changing over time may account for the positive coefficient estimate in 1993. The second qualification is that the effect of treatment appears to be delayed, since the treatment coefficient does not become negative until 2005. This lag may indicate that it took host countries time either to (1) understand the implications of the Maffezini v. Spain decision, or (2) to implement policies in response to the decision.

5.4 Robustness checks

I next address three possible threats to identification. The first is that my model specification suffers from omitted variable bias. Specifically, the Argentina depression and Asian financial crisis happen around the same time as Maffezini v. Spain; I verify whether these regional economic downturns may, in part, be driving the negative result. Second, my coefficient estimates using the continuous measure of treatment may not be robust to the magnitude assumptions I made when constructing this measure. I re-estimate the coefficients using four additional continuous measures of treatment based on different magnitude assumptions. Finally, by excluding dyads from my sample that do not have an active BIT prior to Maffezini v. Spain, I am not controlling for potentially important dyad fixed effects that are captured in multilateral-resistance terms in standard gravity models. To see whether omitting these dyads is affecting the coefficient estimates, I rerun the regressions on a new dataset that includes all dyads. I show below that the negative coefficient estimate on treatment is robust to each of these considerations.

5.4.1 Omitted variable bias

There are two large and negative regional economic shocks that happen around the same time as the Maffezini v. Spain decision. The first is the Argentina Great Depression, which began in 1998 and ended in 2002. The second is the Asian financial crisis, primarily affecting South Korea, Indonesia and Thailand, which began in 1997 and ended in the early 2000s. The origin-year, destination-year fixed effects in my preferred model specification serve as a crude control for these negative regional economic shocks: the model controls for these shocks in a way that assumes that the effect of these shocks is constant across dyads that include one of the countries realizing the economic shock. However, the effect of these shocks is likely very different depending on the investment history within the dyad. For example, in an origin-destination dyad between Germany (origin) and Argentina (destination) with a prior history of positive FDI, the Argentina depression will likely cause a decline in bilateral FDI from Germany to Argentina. By comparison, an origin-destination dyad between Afghanistan (origin) and Argentina (destination) with no prior history of positive FDI will experience no effect from the Argentina depression, since bilateral FDI flows are already at their lower bound.[9]

There is also a second-order spillover effect that will also vary by dyad investment history. An anecdote that illustrates this spillover effect is the case of CMS Energy, an energy company based in the United States. In the late 1990s and early 2000s, CMS Energy owned power plants in several foreign countries including Argentina and Morocco. During the Argentina depression, CMS Energy realized large losses on investments in Argentina. By 2004 these losses exceeded 240 million USD.[10] By 2007, CMS Energy had divested of all international assets including its ownership share in a large power plant in Morocco, valued at over 1.3 billion USD.[11] During this same period, aggregate U.S. FDI flows to Morocco declined by more than 50 percent from 292 million USD in 2003 to 130 million USD in 2006.[12] This large decline in aggregate bilateral FDI can largely be attributed to the divestment by CMS Energy of its assets in Morocco. This divestment decision was directly linked to CMS Energy's exposure to the Argentina depression.

To control for these first and second order effects in a way that varies by the FDI history of each dyad, I create the following regional shock variables for the Argentina depression

9. A similar story could be told in terms of the magnitude of bilateral FDI (a lot versus a little) instead of the binary status of bilateral FDI (some versus none). Note that the latter will not be a threat to identification after I condition on prior FDI, though the former might. For simplicity I consider the binary history of FDI without conditioning on prior FDI to explore whether this story may be partly driving my negative coefficient estimate.

10. CMS Energy v. Argentina (2005)

11. CMS Energy (2007)

12. BEA (2018)

(and the Asian financial crisis):[13]

$$ARG_{ikt} \equiv \frac{FDI_{ia1999}}{\sum_{j\in J} FDI_{ij1999}} \times \mathbb{1}(FDI_{ik1999} > 0) * \mathbb{1}(Y_{ikt} > 1998) \tag{5.2}$$

where FDI_{ia1999} is total bilateral FDI flows from country i to Argentina (Asia) from 1990 to 1999, FDI_{ij1999} is total bilateral FDI flows from i to j from 1990 to 1999, J is the set of all non OECD countries, FDI_{ik1999} is total bilateral FDI flows from i to k in 1999, and Y_{ikt} is the year of the observation. The fraction on the right-hand-side of the equation is the share of FDI from country i to non-OECD countries that is deployed in Argentina (Asia). The first indicator function turns on the shock only for dyads with a prior history of positive FDI. The second indicator function turns on the shock only after the beginning of the economic downturn.

Table 5.6: Controlling for regional shocks: All dyads with Active BIT (3Y)

	(1)	(2)	(3)	(4)
treat x post	-0.48^{+}	-0.48^{+}	-0.49^{+}	-0.49^{+}
	(0.28)	(0.28)	(0.27)	(0.27)
Argentina shock		-8.06^{+}		-4.83***
		(4.30)		(1.47)
Asia shock			-7.92	-7.00
			(4.87)	(4.33)
market integration	x	x	x	x
orig-year, dest-year FE	x	x	x	x
orig-dest FE	x	x	x	x
Observations	9754	9698	9698	9698
R^2	0.916	0.916	0.916	0.916

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

13. The Asian financial crisis regional shock variable is identical, except the post year is 1998 and I use Indonesia, South Korea and Thailand as the source countries of the shock instead of Argentina. Note that introducing these controls is a deviation from the usual gravity-model structure, since I no longer assume that all third-party effects are adequately summarized by the multilateral resistance terms.

Note that, in order to exploit variation in the bilateral FDI history, I use the 3-year-increment dataset for *all dyads* with an active BIT, not just dyads with an active BIT and a prior history of FDI. Using this dataset I re-estimate the coefficients while incrementally adding in these new controls. These estimates are reported in Table 5.6.

The coefficient estimates on both the Argentina shock and the Asia shock individually and collectively are large and negative and the Argentina shock is statistically significant. However, adding in these new controls leaves the coefficient and standard error estimates of the effect of treatment essentially unchanged. This result indicates that the negative effect of treatment is not simply capturing the negative effect of negative regional economic shocks that occur around the same time as the Maffezini v. Spain decision.

5.4.2 Magnitude assumptions for continuous measures of treatment

I next consider whether the coefficient estimate on treatment is sensitive to the subjective decisions I made when constructing my continuous measure of treatment. I check this by running another set of regressions using the three-year-increment dataset and only including dyads with prior FDI.[14] Regressions are implemented on all seven measures of treatment: treatment as an indicator, treatment as a normalized count, the continuous measure of treatment I have used thus far and the four other continuous measures of treatment developed in Appendix B. In these regressions I also use a more sophisticated control variable for an active BIT, BIT strength, that (as discussed in Appendix B) is calculated using the same methodology used to calculate the measure of treatment. I also run another set of regressions that include separate controls for the original strength of each of the five sets of BIT provisions: definitions (DEF), investor protection (PRO), host state obligations (OBL), treaty duration (DUR), and legal remedies (REM). These coefficient estimates are reported

14. This combination of time increment and sample produces the largest negative coefficient estimate, and so I use this as a baseline to compare estimates using the different measures of treatment.

in Table 5.7.[15]

Recall that the method used to construct the five continuous measures of treatment is discussed in Appendix B. Note that measures 1 and 3 are the most conservative measures and are constructed using smaller step sizes in adjustments between different variations of a treaty provision relative to measures 2 and 4. As a result, the treatment distributions of these measures have more clumping towards zero.[16] Measure 5 is a more crude measure, using a more rudimentary count measure of treatment. This measure produces a treatment distribution that is more spread out. The coefficient estimates in Table 5.7 indicate that when the size of the step increases and treatment is amplified for dyads with treatment measures strictly between zero and one (as is the case for measures 2 and 4), the estimate of the effect of treatment is dampened. When a more rudimentary approach to treatment is used (as is the case for measure 5), the treatment effect is still large but the standard errors have increased.

All coefficient estimates on treatment (treat $\times$ post) in Table 5.7, other than treatment coded as an indicator, are negative and many are large and statistically significant. Together these estimates provide evidence that, although the magnitude and variance of the treatment effect does vary to some degree depending on the magnitude assumptions made when constructing the treatment measure, the direction and significance of the result is fairly robust to these different assumptions.

5.4.3 Including dyads without an active BIT prior to Maffezini v. Spain

One final consideration is whether the exclusion of dyads without an active BIT prior to Maffezini v. Spain is affecting the estimate of the treatment coefficient by failing to control

15. Table 5.7 reports the coefficient estimates for BIT strength as well as the strength of the five different BIT provisions. These are reported for completeness. For example, dyads governed by a BIT with stronger legal remedies also realize more bilateral FDI. By contrast, dyads governed by a BIT with stronger procedural protections also realize lower bilateral FDI. However, since the timing of ratification and the content of each BIT may be endogenous to unobserved drivers of FDI, these coefficients merely report correlations and cannot be interpreted as a causal effect.

16. These distributions appear in Figure B1 in Appendix B.

Table 5.7: Comparing Measures of Treatment: 3Y Data, Dyads with prior FDI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ind	count	cont. 1	cont. 2	cont. 3	cont. 4	cont. 5	cont. 1	cont. 2	cont. 3	cont. 4	cont. 5
treat x post	0.034	-0.87*	-0.57*	-0.34	-0.62*	-0.33	-0.61	-0.55*	-0.28	-0.24	-0.64	-0.64
	(0.22)	(0.34)	(0.27)	(0.25)	(0.28)	(0.25)	(0.40)	(0.27)	(0.26)	(0.25)	(0.42)	(0.42)
BIT	-0.19	-0.25	-0.30	-0.32	-0.33	-0.32	-0.36					
	(0.20)	(0.20)	(0.24)	(0.27)	(0.27)	(0.28)	(0.31)					
DEF								1.22	1.57	0.93	0.84	0.84
								(3.11)	(1.86)	(1.70)	(1.54)	(1.54)
PRO								-4.00+	-4.27+	-4.84*	-3.03+	-3.03+
								(2.41)	(2.41)	(2.11)	(1.74)	(1.74)
OBL								0.25	0.32	-0.33	-1.65	-1.65
								(1.16)	(1.11)	(1.14)	(1.64)	(1.64)
DUR								0.19	0.25	0.97	0.84	0.84
								(3.37)	(1.73)	(1.53)	(1.09)	(1.09)
REM								1.93**	1.59**	1.69***	1.98+	1.98+
								(0.71)	(0.59)	(0.51)	(1.18)	(1.18)
market integration	x	x	x	x	x	x	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x	x	x	x	x	x	x
orig-dest FE	x	x	x	x	x	x	x	x	x	x	x	x
Observations	5182	5182	5182	5182	5182	5182	5182	5182	5182	5182	5182	5182
R^2	0.925	0.926	0.926	0.925	0.926	0.925	0.925	0.926	0.926	0.926	0.926	0.926

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

for potentially important multilateral resistance terms created by these dyads. I explore this by adding all dyads without an active BIT into my dataset and rerunning the regressions using this complete dataset. All added dyads will be control dyads, since treatment by Maffezini v. Spain only operates through an active BIT.

The introduction of a second control group presents an opportunity to run a difference-in-difference-in-differences (or triple difference-in-differences) regression using this complete dataset. To do this I use the following model specification:

$$
\begin{aligned}
FDI_{ijt} = \exp\Big[&\beta_0 + \beta_1 \times (Treat_{ij} \times BIT_{ij1999} \times Post_t) \\
&+ \beta_2 \times (Treat_{ij} \times BIT_{ij1999}) \\
&+ \beta_3 \times (Treat_{ij} \times Post_t) \\
&+ \beta_4 \times (BIT_{ij1999} \times Post_t) \\
&+ \alpha' X_{ijt} + \gamma_{ij} + \delta_{it} + \psi_{jt}\Big] \times \epsilon_{ijt}
\end{aligned} \tag{5.3}
$$

All terms in this model specification are identical to the previous model specification with one notable addition, BIT_{ij1999}, which is an indicator variable equal to 1 if dyad ij has an active BIT in 1999. Recall that the standard simple triple difference-in-differences model specification would also include independent $Treat_{ij}$, BIT_{ij1999} and $Post_t$ terms. However, $Treat_{ij}$ and BIT_{ij1999} are soaked up by the origin-destination fixed effect and $Post_t$ is soaked up by the origin-year and destination-year fixed effects. The coefficient of interest is β_1, which provides an estimate of the treatment effect in the triple difference-in-differences model specification.

I run the triple difference-in-differences regression on the three original treatment measures: indicator, count, and the first continuous treatment measure. Note that the multilateral resistance terms I am intending to control for in this new set of regressions will be negligible for dyads that do not realize any bilateral FDI flows, since these dyads do not create any resistance for FDI flows between other dyads. As a result, I use the three-year-increment dataset that only includes dyads with a history of positive FDI. The coefficient estimates are reported in Table 5.8. Columns 1-3 report estimates using the triple difference-in-differences specification and the larger dataset including dyads without an active BIT in 1999. Columns 4-6 report the original estimates from Table 5.5 using the original difference-in-differences specification and only dyads with an active BIT in 1999. As can be seen in the estimates, the negative treatment effect still persists in these new estimates though with larger standard errors.

One caveat to these estimates is that the 2,066 dyads in the new control group are almost certainly systematically different from the dyads in the original sample. These new dyads consist primarily of dyads with two developed economies that realize, on average, much higher bilateral FDI flows. For example, the mean aggregate bilateral FDI flows from 1990 to 1999 in the original sample is 354 million USD compared to 1.42 billion USD in the new control group. In light of these systematic differences the original coefficient estimates are likely more reliable. The new estimates simply provide evidence that the negative treatment effect is not being driven by omitted multilateral resistance terms that arise from excluding dyads between these developed economies.

Table 5.8: Including Dyads with no active BIT in 1999: 3Y data, prior FDI

	(1)	(2)	(3)	(4)	(5)	(6)
	Indicator	Count	Cont. 1	Indicator	Count	Cont. 1
treat × BIT × post	-0.084	-1.61^{+}	-1.75			
	(0.45)	(0.95)	(1.22)			
treat × post	0.27	1.48	1.70	0.034	-0.87^{*}	-0.57^{*}
	(0.35)	(0.91)	(1.23)	(0.22)	(0.34)	(0.27)
treat × BIT	0.23	0.26	0.24			
	(0.24)	(0.24)	(0.23)			
BIT × post	-0.17	0.048	0.010			
	(0.25)	(0.16)	(0.12)			
BIT	0.097	0.12	0.11	-0.19	-0.25	-0.24
	(0.13)	(0.13)	(0.13)	(0.20)	(0.20)	(0.20)
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE	x	x	x	x	x	x
Dyads with an active BIT	x	x	x	x	x	x
Dyads with no active BIT	x	x	x			
Observations	19997	19997	19997	5182	5182	5182
R^2	0.900	0.900	0.900	0.925	0.926	0.926

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Market integration: FTA, common market, common customs union, and both members of the GATT

5.5 Exploring mechanisms

The coefficient estimates in section 5.4 provide further evidence that imposing new legal remedies on a host economy may, on average, lead to a decline in protected bilateral FDI. This result may be driven by: (1) a supply side (i.e. investor) response to treatment, or (2) a demand side (i.e. host country) response to treatment. I consider each below.

5.5.1 Investor response

At first glance, a negative investor side response to treatment seems unlikely. Treatment by Maffezini v. Spain means that investors now enjoy a broader set of legal remedies under the BIT, thus making it safer to invest in the destination economy. This reduction in risk increases the expected return from investing and should, at least in theory, lead to more investment.

One possible story for a negative supply side response is that investors are concerned that imposing new legal remedies on a host economy may result in the BIT being terminated and/or renegotiated by the host economy. Risk of termination of a BIT may (1) increase uncertainty regarding the protections available to investors, which may (2) decrease the expected return for investment, and may therefore, (3) cause a decline in investment

To explore whether the observed decline in investment can be attributed to a negative supply side response caused by investor concerns regarding BIT terminations, I introduce 5 variations of a control for BIT termination with varying degrees of endowed investor foresight: (1) no foresight (i.e. just turning off treatment after a realized event of termination or renegotiation), (2) probability with no foresight (i.e. investors use the past history of treaty terminations and renegotiations to forecast the probability a host economy will terminate a particular BIT), (3) probability with 5 year foresight (i.e. investors can perfectly predict treaty termination and renegotiation 5 years early and incorporate these predictions into their forecasts of future treaty terminations and renegotiations), (4) probability with 10 year foresight (similar to the previous iteration), and (5) perfect foresight (i.e. turning off treatment across the entire panel for all dyads that eventually realize a BIT termination or renegotiation). Each of these regressions will use the original continuous treatment measure, three-year-increment data and dyads with prior FDI. As a benchmark I first report the original coefficient estimate without controlling for treaty terminations. I then run the same regression using each of the 5 variations of controlling for treaty termination.

Table 5.9: Controlling for Treaty Terminations: Active BITs with Positive FDI (3Y)

	(1) no Term	(2) no Foresight	(3) Prob. w/ no Foresight	(4) Prob. w/ 5Y Foresight	(5) Prob. w/ 10Y Foresight	(6) Perfect Foresight
treat x post	-0.57*	-0.62*	-0.61*	-0.78**	-1.03***	-0.98***
	(0.27)	(0.26)	(0.27)	(0.30)	(0.31)	(0.28)
market integration	x	x	x	x	x	x
orig-year, dest-year FE	x	x	x	x	x	x
orig-dest FE	x	x	x	x	x	x
Observations	5182	5182	5182	5182	5182	5182
R^2	0.926	0.926	0.926	0.926	0.926	0.926

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Market integration: BIT, FTA, common market, common customs union, and both members of the GATT

As can be seen in Table 5.9, controlling for treaty terminations under any of these variations amplifies the negative effect of treatment. This result provides evidence that the reduction in foreign investment is not being driven by a negative investor response caused by greater policy uncertainty arising from fears of treaty terminations and renegotiations.

5.5.2 Host country response

Finally, I explore whether there is a demand side response (i.e. a host country response) to treatment. Treatment by Maffezini v. Spain means the host country is now exposed to a broader set of legal remedies than what was originally agreed to in a BIT. Holding all else equal, this exposure increases a host country's risk of arbitration. This increase in risk lowers the expected benefit to the host country of hosting foreign investment. As a result, the host country may be less aggressive in pursuing foreign investment (i.e. a host country will offer fewer tax breaks or be less aggressive in implementing other policies designed to attract foreign investment), which, in turn, may lead to a decline in protected bilateral FDI.

This story is consistent with the pattern we observe in Figure 5.2. Treated dyads, prior to treatment, have higher FDI relative to control dyads. This may be evidence that host countries favor investment from treated dyads prior to Maffezini v. Spain because of the lower risk of arbitration. After treatment, FDI flows in treated and control dyads converge systematically across the distribution. This may be evidence that, once arbitration risks become homogeneous across the treatment and control groups through the application of MFN, treated dyads no longer enjoy better access to investment opportunities in the host country. Unfortunately, this mechanism is difficult to test since data on variation in investment incentives at the dyad level is hard to come by.

One way to think about this mechanism is to consider projects sponsored by a host country and awarded through a bidding process (i.e. natural resource extraction). Consider a simple case with a host economy sponsoring a project and two firms from different source countries (A and B) bidding for the contract. Suppose both A and B have signed a BIT with the host economy and the BIT with A includes weaker legal remedies relative to the BIT with B. Suppose that firms from both A and B submit an identical bid for the contract. All else being equal, the host economy will prefer the bid from A, since the risk of arbitration to the host economy from hosting an investment from A will be less relative to hosting the same investment from B. So, prior to Maffezini v. Spain, firms from A have a comparative advantage relative to firms from B in terms of access to investment opportunities in the host economy. After Maffezini v. Spain, the application of MFN to legal remedies eliminates the comparative advantage of firms in A, leading to a convergence in FDI from A and B to the host economy.

In a crude attempt to verify whether or not this mechanism is driving the result I sort dyads into two groups: (1) dyads where at least 10 percent of GDP in the destination economy is derived from natural resource extraction, and (2) dyads where less than 10 percent of GDP is derived from natural resource extraction. I then run my regression separately on these two groups. A negative coefficient on treatment in group 1 and a positive or zero coefficient on treatment in group 2 would provide evidence suggesting that this mechanism may be driving the negative result. The coefficient estimates in Table 5.10 actually present the opposite result. This provides weak evidence that imposing new legal remedies on a host country that derives a substantial share of its GDP from natural resource extraction does not cause a decline in bilateral FDI.

Note that, due to the crude nature of the experiment (I only observe aggregate bilateral FDI, not bilateral FDI by industry and I am only considering one manifestation of preferential treatment (awarding a bid contract for natural resource extraction)) these results do not rule out the broader demand side mechanism described in this section. It merely fails to provide evidence that the mechanism is operating in this particular industry through this particular preferential treatment.

Table 5.10: Demand Response: Natural Resources > 10 percent GDP

	(1) All	(2) > 10 percent	(3) < 10 percent
treat × post	-0.57*	0.11	-0.51+
	(0.27)	(0.40)	(0.30)
BIT	-0.24	0.37	-0.25
	(0.20)	(0.43)	(0.26)
market integration	x	x	x
orig-year, dest-year FE	x	x	x
orig-dest FE	x	x	x
Observations	5182	562	4560
R^2	0.926	0.983	0.928

Standard errors in parentheses. All standard errors are clustered at the origin-destination level.

$^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Market integration: FTA, common market, common customs union, and both members of the GATT

CHAPTER 6

CONCLUSION

This paper considers whether including stronger legal remedies in an investment treaty causes an increase in foreign investment. To answer this question I introduce the UNCTAD IIA Database, which I built in partnership with UNCTAD, on the provision level detail of more than 2,500 BITs. I also identify the Maffezini v. Spain decision as a natural experiment that endowed some investors with stronger legal remedies through an unanticipated application of the MFN protection. Using this database and natural experiment I find robust evidence that stronger legal remedies in a BIT do not lead to more investment. I also find suggestive evidence that stronger legal remedies imposed on a host economy may actually lead to a decline in investment. The mechanism driving this decline may be a host country response to an increase in the implicit cost of receiving foreign investment. However, due to data limitations I am not able to empirically verify this mechanism.

These results suggest that India's current policy trajectory (and other host economies considering similar policy actions) to negotiate new BITs with weaker legal remedies will likely not have a negative affect on its ability to attract new foreign investment. The evidence also suggests that negotiating new BITs with weaker legal remedies may actually lead to more protected foreign investment as host economies become more likely to accept and pursue foreign investment in response to a reduction in the implicit cost of receiving FDI.

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Appendices

APPENDIX A

BIT PROVISIONS AND SUMMARY STATISTICS

This Appendix provides a summary of the BIT provisions documented in the UNCTAD IIA Database that are used to construct control variables of BIT strength and provision strength by category in Appendix B. I also present summary statistics of the number and proportion of BITs in the Database that are active in 2000 that include a particular variation of each provision. Recall that, for this project, I have divided BIT provisions into five broad categories: (1) legal remedies, (2) definitions, (3) investor protections, (4) host state obligations, and (5) duration. A description and summary statistics for the legal remedies provisions is presented in Chapter 3. The other four categories are presented below.

A.1 Defining investor/investment

All BITs include a definition of what qualifies as an investment and/or who qualifies as an investor to be protected by the BIT. Each of these definitions may be stated broadly or with limitations. The definitions section of a BIT may also include carve-outs excluding various policy actions from the scope of the BIT.

The definition of investment sets forth what assets or business interests qualify as an investment under the treaty. The broadest formulation of the definition of investment is stated with no qualifications. The Database documents five possible limitations to the investment definition. First, the definition may exclude portfolio investment (i.e. shares in a company). Second, the definition may exclude "other assets" such as commercial transactions and non-business real-estate investment. Third, the definition may enumerate characteristics an investment must have in order to qualify as an investment under the treaty (i.e. a commitment of capital and an assumption of risk). Fourth, the definition may limit BIT protections to only apply to investments that are made in accordance with host country laws. Fifth, the definition may be narrowly stated as a closed list of specific protected investments.

The definition of investor sets forth who is considered an investor under the treaty. This definition typically includes a definition for natural persons (NP) and a definition for legal entities (LE). The natural person definition may be broadened by explicitly including permanent residents. It may also be narrowed by explicitly excluding citizens with dual nationality. The legal entities definition may be limited in two ways. The first is by imposing a business activity requirement, which would eliminate shell corporations from the definition. The second is by requiring a legal entity to exercise ownership and control over the investment.

The definitions section of a BIT my also be limited by excluding particular policy actions from the scope of the treaty. Four exclusions documented in the Database are: (1) taxation, (2) subsidies and grants, (3) government procurement, and (4) other subject matter. These limitations are intended to enable a country to pursue these policy actions (i.e. taxation) without risk of being accused of violating the BIT.

Table A1: Definitions in Active BITs in 2000

Provision		BIT count	BIT share
Investment	Defined	1,239	97.71
	Limit 1: exclude portfolio	2	0.16
	Limit 2: exclude other assets	26	2.05
	Limit 3: characteristics of investment	6	0.47
	Limit 4: in accordance w/ state laws	768	61.99
	Limit 5: closed list of investment	36	2.84
Investor	Defined	1,204	94.95
	Natural Person	164	12.93
	NP Limit 1: Includes Permanent Residents	127	10.02
	NP Limit 2: Excludes Double Nationality	52	4.10
	LE Limit 1: Business activity requirement	157	12.38
	LE Limit 2: Ownership and control defined	150	11.83
Policy Exclusions	taxation	86	6.79
	subsidies/grants	30	2.37
	gov. procurement	21	1.66
	other subject matter	71	5.60

A.2 Investor Protections

A BIT also contains protections guaranteed by each signatory to investments and investors from the counter-signatory. The primary investor protections in a BIT are (1) protection from discrimination and (2) protection from expropriation.

A BIT may protect investors from discrimination relative to domestic investors through a "National Treatment" (NT) clause. This clause guarantees that investors protected by the BIT will be treated at least as well by the host government as domestic investors. Similarly, a BIT may protect investors from discrimination relative to other foreign investors through a "Most-Favored-Nation" (MFN) clause. This clause guarantees that protected investors will be treated at least as well by the host government as it treats any other foreign investor. As discussed in this paper, the MFN protection has turned out to be an important provision in the BIT network.

The second BIT protection is protection from expropriation, which protects investors from having their assets taken by the host government without due process of law and without prompt and just compensation. There are two variations of the expropriation protection. The first includes a reference to indirect expropriation. The second does not. A reference to indirect expropriation extends the protection to include protection from actions by the host government that may not involve the actual seizure of assets, but still result in depriving the investor of either the value or the control of their assets (i.e. requiring that a majority holding in the asset be transferred to a domestic investor). This extension to indirect expropriation may be limited by stating a definition of indirect expropriation. The broader expropriation protection may also be limited by including a carve-out for general regulatory measures. This means that general regulatory measures implemented by the host government that may undermine the value of an investment do not qualify as an act of expropriation.

Table A2: Investor Protections in Active BITs in 2000

Provision		BIT count	BIT share
Non-Discrimination	NT	1,001	78.94
	MFN	1,244	98.11
Expropriation	w/ indirect expro	1,171	92.28
	w/out indirect expro	96	7.57
	Limit 1: indirect expropriation defined	33	2.60
	Limit 2: carve-out for regulatory measures	73	5.76

A.3 Host State Obligations

Host State obligations in a BIT may include: (1) compensation for losses, (2) prohibition on performance requirements, (3) allowing the employees of the investor to enter and work in the country, (4) allowing investors autonomy over their choice of senior managers and/or board members, and (5) allowing the free transfer of assets.

Compensation for losses are paid out by the host government in specified circumstances such as armed conflict, civil unrest or natural disasters. This has two common variations. The first is a relative right to compensation. The second is an absolute right to compensation. The relative right to compensation may be relative to either domestic investors (NT), other foreign investors (MFN), or both. An absolute right to compensation, when included in this provision, is typically for losses directly caused by an action of the host government.

The second obligation is to not impose performance requirements on an investor. Performance requirements often involve different restrictive measures designed to ensure that the foreign investment benefits the host economy in a particular way. For example, a host government may require a foreign investor to use a certain amount of domestic inputs when producing a product or require that a certain share of output be sold in the domestic market. BITs often include a host state obligation to not impose particular performance requirements. There are two refinements of this obligation. The first is the incorporation of the provisions of the WTO Agreement on Trade-Related Investment Measures (TRIMs) which lists various performance requirements that are prohibited. The second is an ad hoc listing of various prohibited performance requirements.

The third obligation is to allow the employees of the investor to enter and work in the country. This obligation deals with visa issues and is typically limited to not exceed what current domestic legislation would allow with respect to the entry and work opportunities of foreign employees.

The fourth obligation is allowing investors to choose their senior managers and/or board members. This obligation is typically absolute (i.e. without reference to current domestic legislation). Thus the host state is obligated to honor senior management and board leader appointments by the investor and must help facilitate the visa process for these individuals.

The fifth obligation is allowing investors to freely transfer their assets without undue delays. This obligation may be subject to two qualifications. The first is a balance of payments (BOP) exception. The second is other listed exceptions. The BOP exception allows countries to deviate from the free transfers obligation if it faces a serious balance of payments difficulty. Other listed exceptions may include cases where an investor has filed for bankruptcy or owes money as a result of a judicial or arbitral award.

Table A3: Host State Obligations in Active BITs in 2000

Provision		BIT count	BIT share
Compensation for losses	Included	1,165	91.88
	Relative right: no reference	31	2.44
	Relative right: NT only	30	2.37
	Relative right: MFN only	258	20.35
	Relative right: NT and MFN	846	66.72
	Absolute right	338	26.66
Prohibition on perf. reqs.	Included	71	5.60
	w/ TRIMs	4	0.32
	w/ ad hoc list	50	3.94
Entry of personnel	Included	464	36.59
Senior managers	Included	86	6.78
Free transfer of assets	Included	1,260	99.37
	w/ BOP qualification	98	7.73
	w/ other qualification	93	7.34

A.4 Duration

The duration of a BIT depends on the following provisions: (1) the actual duration of the BIT, (2) whether a BIT automatically renews, (3) the method for terminating the BIT, and (4) the amount of time the BIT protections and obligations survive after an event of termination. The term of time that the BIT protections are in place may also be modified by (5) limitations to the scope of the BIT.

The duration of a BIT is the length of time the BIT is in force. The period is typically 10 or 15 years but the duration of some BITs may be as long as 20 years. A few BITs have an indefinite duration.

Many BITs include an automatic renewal clause that comes into effect after the initial duration of the treaty concludes. There are two common variations of the automatic renewal clause. The first is automatic renewal of an indefinite duration. The second is automatic renewal of a fixed duration. Renewal of indefinite duration is subject to the right of either party to terminate the treaty as specified in the termination clause. Renewal of a fixed duration often mirrors the initial duration of the treaty (i.e. 10 or 15 years).

Most BITs specify when and how a BIT may be terminated. This typically includes a time component (i.e. after the BIT has been in force for a certain number of years) and a notice component (i.e. by written notice to the other party). The termination provision will also specify the length of the notice period (i.e. one year's written notice).

A survival clause may also be included to extend certain protections and obligations of the treaty for a certain amount of time after an event of termination. A survival clause will typically specify which protections and obligations are extended and for how long.

Additional provisions that can modify the duration of the treaty are: (1) limiting the temporal scope of the investments covered and (2) limiting the temporal scope of the disputes covered. Under the first limitation, BIT protections and obligations only cover investments that happen after the BIT enters into force, cover all investments regardless of whether the investment occurred prior to entry into force, or the BIT does not specify either case. Under the second limitation, the signatories may prevent legal claims arising out of actions or disputes that occur prior to the entry into force of the BIT.

Table A4: Duration Provisions in Active BITs in 2000

Provision		BIT count	BIT share
Duration	<10 years	59	4.73
	10 years	925	72.95
	15 years	202	15.93
	20+ years	50	4.01
	indefinite	33	2.64
Automatic renewal	Included	1,237	97.48
	Indefinite	781	61.58
	Fixed term <10	195	15.63
	Fixed term 10+	261	20.91
Termination	Included	1,242	97.95
Survival Clause	None	33	2.64
	<10 years	48	3.85
	10-14 years	677	53.44
	15 years	288	22.73
	20 years	222	17.52
Temporal scope limits	Investments post EIF only	90	7.09
	Investments both pre & post EIF	995	78.41
	No investment specification	161	12.69
	Disputes post EIF only	350	27.58

APPENDIX B

CALCULATING TREATMENT

This appendix describes five different methods of calculating a continuous measure of treatment by the Maffezini v. Spain decision. I first describe, for one continuous measure of treatment, how I determine the strength of the original legal remedies in each BIT as well as the strength of legal remedies following Maffezini v. Spain. The difference of these two measures provide my first continuous measure of treatment. I then describe the other four methods, relative to my first method, used to assign scores to each variation and to then combine those scores into four alternative strength measures. I also describe how these different methods can be applied to other provision categories in a BIT to develop measures of both treaty strength broadly, and provision category strength individually. These measures are used as additional controls in robustness checks as part of the empirical analysis in Chapter 5.

B.1 Method 1: baseline step rule

Each continuous measure of treatment is calculated in three steps. First I develop a method to measure the strength of the original set of legal remedies in each BIT. Second, I use this same method to measure the strength of legal remedies after treatment. Third, I construct a treatment variable by taking the difference of the new and the old strength measures.

Recall that the legal remedies section of a BIT consists of three baseline provisions (scope, forum, and forum interactions), three limitations (provisions, policy and tax), and one qualification (consent). For ease of exposition I will build on the hypothetical treaty network from section 4.3 and I replicate Table 4.1 from this section below.

To measure the strength of the original legal remedies in each BIT I start with the ordinal rank system developed in section 4.3. For the three baseline provisions (X_1, X_2, and X_3), I replace the ordinal rank with a numerical score, starting at 1 and decreasing the score by

Table B1: Identifying Treatment by Maffezini v. Spain

	Treaty 1	Treaty 2	Treaty 3	Treaty 4
Scope (X_1)	A	B	B	C
	A	**A**	**A**	**A**
Forum (X_2)	C	C	C	B
	B	**B**	**B**	**B**
Forum Interaction (X_3)	D	C	C	B
	B	**B**	**B**	**B**
Limit on provisions (L_1)	A	A	A	A
	A	**A**	**A**	**A**
Limit on policy (L_2)	B	B	B	B
	B	**B**	**B**	**B**
Limit on tax (L_3)	B	B	B	A
	A	**A**	**A**	**A**
Consent withheld (Q_1)	A	B	A	A
	A	**A**	**A**	**A**

0.1 for each step down in the ranking. For the three limitations (L_1, L_2, and L_3), I assign a score of 1 if the limitation is not included and a score of 0.9 if the limitation is included. For the consent qualification (Q_1), I assign a score of 1 if consent to arbitration is unconditional and a score of 0.5 if consent is conditioned on the approval of a host economy.[1] The overall strength of legal remedies is calculated using a simple average of the strength of the three baseline provisions, scaled by the limitations and the consent qualification. Note that the baseline provisions are scaled by the limitations and qualification provisions, since including these provisions limit access to the baseline provisions.

$$REM = Q_1 \left[\frac{1}{3}(X_1 + X_2 + X_3) \right] L_1 \times L_2 \times L_3$$

The measure is bounded by 0 and 1 by construction with strong legal remedies being close to 1 and weak legal remedies being close to 0. Applying this method to the hypothetical treaty network yields the results in Table B2.

Note that the strength of each provision is uniform across the treaties after Maffezini v.

1. Note that the size of this penalty reflects the fact that this qualification will severely limit an investor's access to the broader set of legal remedies.

Table B2: Estimating Treatment by M. v. Spain

	Treaty 1	Treaty 2	Treaty 3	Treaty 4
Scope (X_1)	1	0.9	0.9	0.8
Forum (X_2)	0.8	0.8	0.8	0.9
Forum Interaction (X_3)	0.7	0.8	0.8	0.9
Limit on provisions (L_1)	1	1	1	1
Limit on policy (L_2)	0.9	0.9	0.9	0.9
Limit on tax (L_3)	0.9	0.9	0.9	1
Consent withheld (Q_1)	1	0.5	1	1
REM (strength)	0.675	0.3375	0.675	0.78
Treatment (ind.)	1	1	1	1
Treatment (count)	$\frac{2}{7} \approx 0.286$	$\frac{5}{7} \approx 0.714$	$\frac{4}{7} \approx 0.571$	$\frac{1}{7} \approx 0.143$
Treatment (cont. 1)	0.165	0.5025	0.165	0.06

Spain, where all provisions now take on the highest value across the set of treaties. As a result, the strength of the legal remedies is now the same for all four treaties. Using the original (REM_o) and modified (REM_m) strength of legal remedies we can now create a measure of treatment by Maffezini v. Spain:

$$TREAT = REM_m - REM_o$$

The treatment measures for the hypothetical treaties above are 0.165, 0.5025, 0.165 and 0.06 respectively. Applying this method to the set of 2,536 origin-destination dyads governed by the 1,268 mapped active BITs enables me to measure the original and modified strength of legal remedies as well as the measure of treatment for each dyad.

B.2 Other measures

Note that the first method of constructing a continuous measure of treatment requires that I make subjective decisions about the strength difference of different variations of the same protection. I also make subjective decisions regarding the relative importance of each of the seven provisions. Methods 2 through 4 use a similar methodology, but make different assumptions about these magnitudes. Method 5 uses a simple variation of the count measure.

- Method 2: 0.2/0.8 - The most favorable variant of a provision is assigned a score of 1. Each subsequent variant is decreased by 0.2. Limitations and exceptions are scaled by 0.8. Consent withheld is scaled by 0.2.

- Method 3: 0.5/0.9 - The most favorable variant of a provision is assigned a score of 1. Each subsequent variant is decreased by a factor of 0.5 divided by the number of variants less 1. For example, if a provision has two variations, the best variant is scored as 1 and the second is scored as 0.5. If a provision has three variations, the best variant is scored as 1, the second is scored as 0.75 and the third is scored as 0.5, etc. Limitations and exceptions are scaled by 0.9. Consent withheld is scaled by 0.5.

- Method 4: 0.5/0.8 - The same as Method 3 except limitations and exceptions are scaled by 0.8 and arbitration consent withheld is scaled by 0.2.

- Method 5: Simply count how many of the seven provisions are formulated as the most favorable variant.

As I did in method 1, I calculate a final score for legal remedies under methods 2-4 by taking a simple average of the core provisions scaled by the score of the limitations and the qualification. The final method (Method 5) drops the functional form assumption and simply normalizes the count measure by dividing by seven.

To create a treatment measure under these four alternative methods, I again calculate the strength of legal remedies before and after treatment for each method and then take the difference. As I did in section 4.3, I can now plot the treatment distributions for each method for the dyads with a mapped and active BIT. These distributions appear in Figure B1.

B.3 Extending methods to control for original BIT content

These methods for measuring the strength of legal remedies can also be applied to measure the strength of the other four categories of BIT provisions: definitions (DEF), host state obligations (OBL), investor protections (PRO), and duration (DUR). I can then use these measures (in addition to the original legal remedies (REM) measure) in lieu of a simple indicator variable for an active BIT, as additional controls for the strength of the original BIT in the difference-in-differences regressions.[2] It is also possible to take a simple average of these category scores to come up with a single measure of original treaty strength to use as an alternative control:

$$BIT = \frac{1}{5} * \left(DEF + OBL + PRO + DUR + REM \right) \tag{B.1}$$

With these five measures I can estimate the original strength of each BIT and then estimate the modified strength by using the modified strength of the legal remedies category. The distributions of treaty strength prior to treatment and after treatment are presented in Figures B2 and B3, respectively.

2. This approach is implemented in Table 5.7

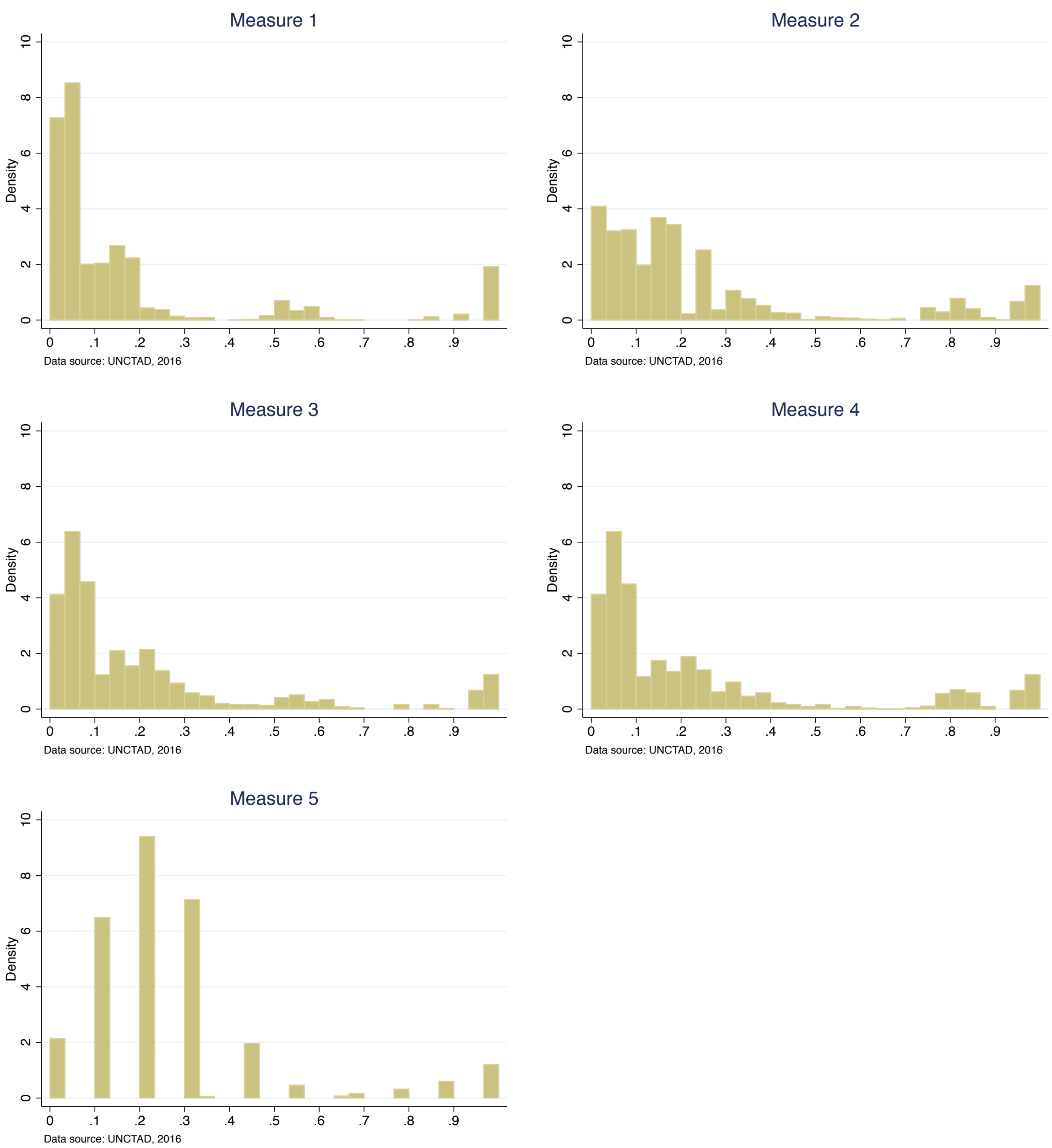

Figure B1: Treatment Distributions

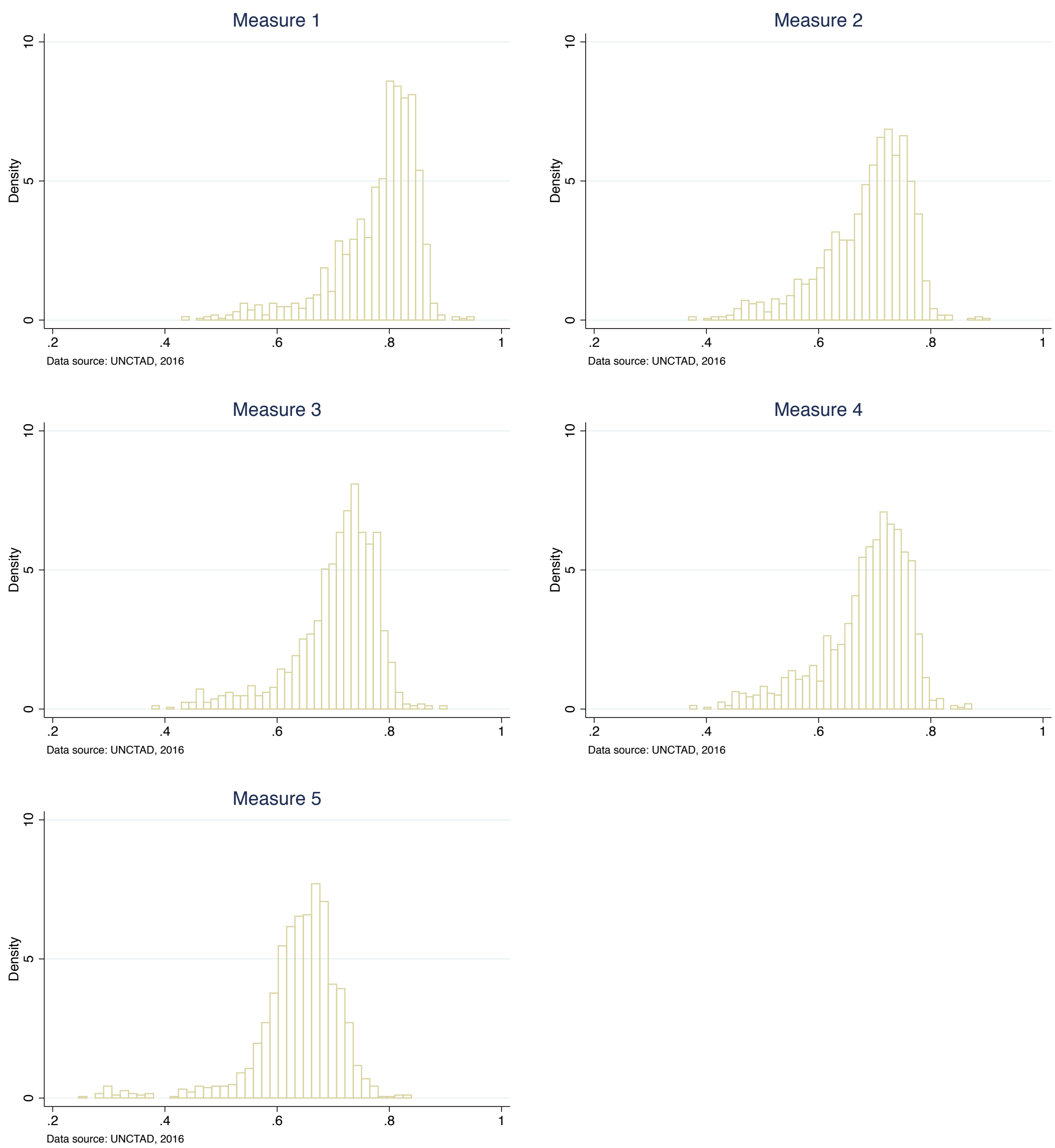

Figure B2: BIT Strength Distribution Prior to Maffezini v. Spain

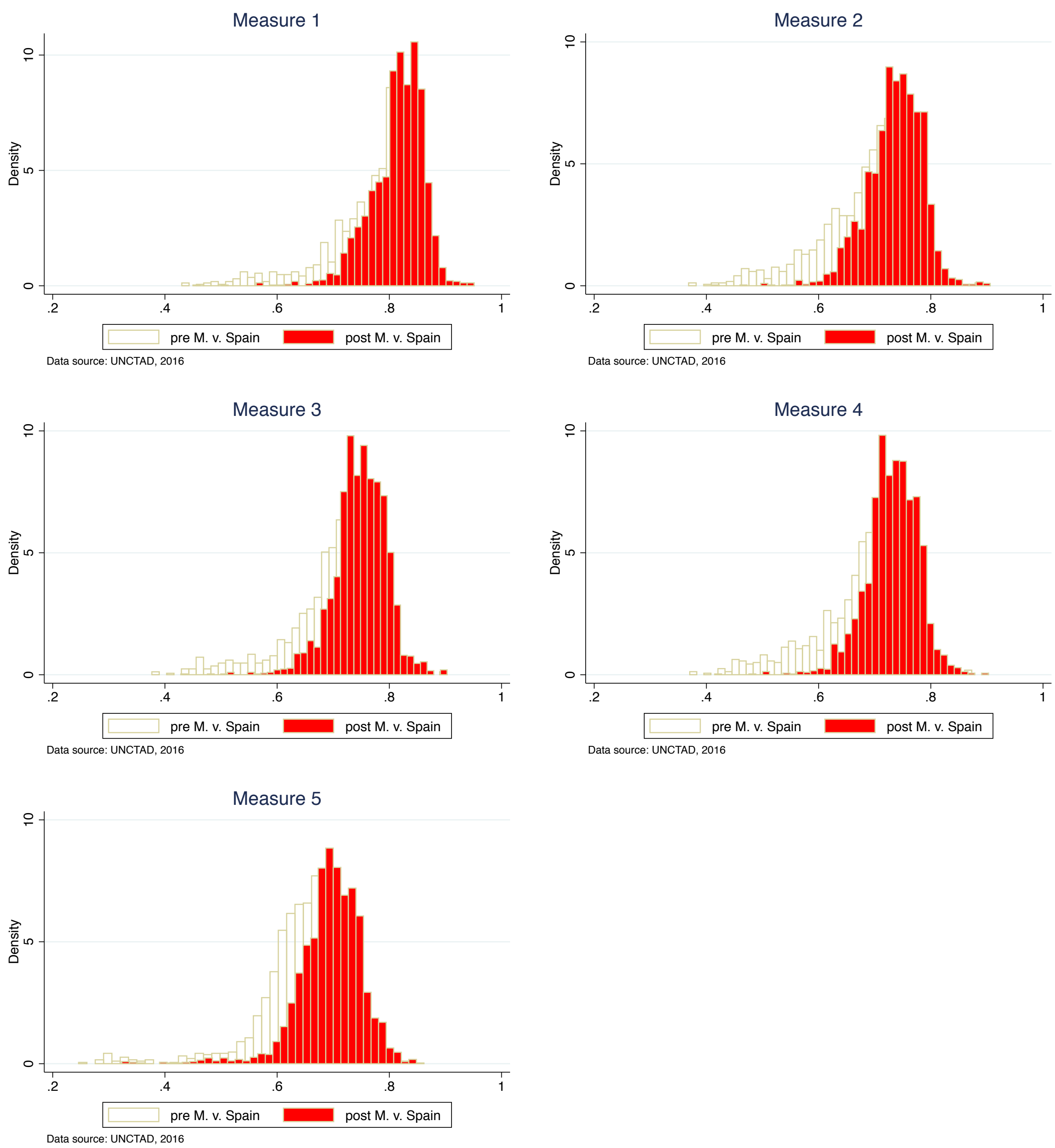

Figure B3: Comparing BIT Strength Pre and Post Maffezini v. Spain