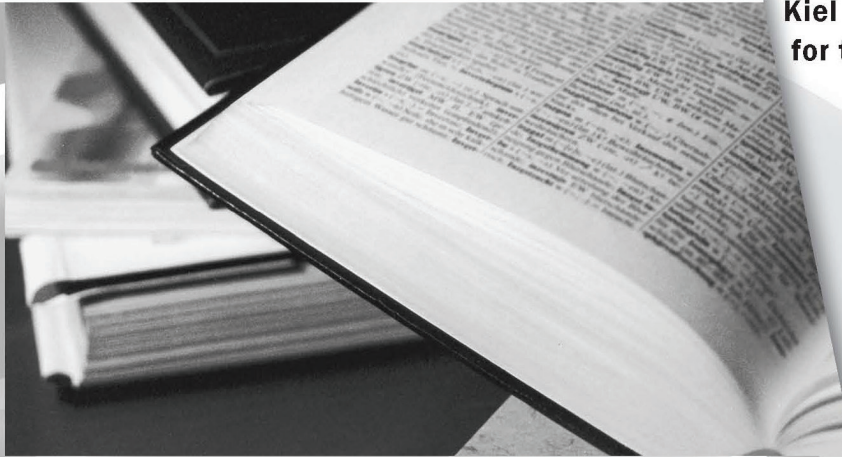*Kiel*

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Abstract:

The recent boom of investor-state disputes filed under international investment agreements has fueled a controversial academic and policy debate. Despite its importance, there has been very little work to date on the impacts of compensation claims by investors on FDI flows to the responding host country. We study this question using a comprehensive dataset of FDI flows, compensation claims and bilateral investment treaty (BIT) participation. We allow for differential impacts of compensation claims against a host on inward FDI flows from BIT-partner and non-partner countries. Focusing on these differences allows us both to shed new light on how investment treaties might influence investor behavior, as well as allowing us to control for unobserved changes in the host-country investment climate. We find that BITs stimulate bilateral FDI flows from partner countries – but only so long as the host country has not had a claim brought against it to arbitration. When a host faces a claim, FDI from sources with a BIT in place falls significantly more than that from unprotected sources. Furthermore, after the host has faced a claim, the entry into force of new BITs is no longer associated with increased FDI flows.

Keywords: bilateral investment treaties, investor-state dispute settlement, compensation claims, protected and unprotected investors.

JEL classification: F21; F23; F53

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1. Introduction

The regime of international investment agreements (IIAs) has never been more controversial. As UNCTAD observes, there is "a growing dichotomy in the directions of investment policies over the last few years, which has manifested itself in simultaneous moves by countries to expand the global IIA regime and to disengage from it" (UNCTAD 2014: 116). On the one hand strict investment provisions are being negotiated within comprehensive agreements between the world's biggest economies such as the Transatlantic Trade and Investment Partnership (TTIP). On the other hand long-time supporters of investor protections such as Germany are questioning the investor-state dispute settlement (ISDS) provisions which have become an integral part of IIAs. Meanwhile South Africa and some Latin American countries are trying to withdraw from the IIA regime.

One reason for the wavering enthusiasm for IIAs - voiced by South African representatives, among others - is skepticism about the effectiveness of IIAs in inducing additional foreign direct investment (FDI). This skepticism has been echoed in numerous - though far from all - empirical studies.[1] In addition, the reticence on behalf of some governments is linked to the steady rise in IIA-related disputes and claims for compensation that foreign investors have brought against host-country governments that had allegedly broken their treaty obligations.[2] The frequency of these claims soared from less than ten per annum until the late 1990s to about 50 per annum since 2011. The number of known cases of ISDS reached 608 by end-2014 (UNCTAD 2015a). Skovgaard Poulsen and Aisbett (2013) show that the likelihood of signing new bilateral investment agreements (BITs) declines significantly after a host country has been subject to a claim itself.

The current paper examines the impact on FDI of claims by investors against hosts for alleged violation of BIT obligations ("compensation claims"). In doing so, we shed light on the long-term costs and benefits to hosts of concluding BITs. By examining the pattern of responses to claims through the lens of economic theory, we find indirect evidence supporting a causal impact of BITs on FDI decisions of foreign investors. This impact is not, however, beneficial for all host countries once the potential costs of violating BIT obligations are taken into account.

In contrast to the controversial debate and substantial literature on the effects of BIT signing on the host country's attractiveness to FDI, the effects of subsequent disputes have received scant attention so far. In particular, little is known about how FDI flows react to disputes and arbitration settlements. Allee and Peinhardt (2011) provide a major exception. These authors find that FDI flows to developing host countries decline when they are taken before the International Centre for Settlement of Investment Disputes (ICSID), in particular when they lose a dispute in ICSID arbitration. However, Allee and Peinhardt

[1] See the contributions to the volume edited by Sauvant and Sachs (2009). More recent papers include Busse et al. (2010), Tobin and Rose-Ackermann (2011), Berger et al. (2011; 2013), Egger and Merlo (2012), and Büthe and Milner (2014).

[2] Note that we use the terms 'disputes' and 'claims' interchangeably in the following to indicate instances in which an investor brings a claim for compensation for alleged violation of a treaty's provisions to formal ISDS.

(2011) do not distinguish between FDI flows from BIT partner countries and non-partner countries. Both groups of foreign investors are assumed to react similarly to disputes by downsizing existing FDI engagements and revising or even cancelling investment plans.

Unlike Allee and Peinhardt (2011), we suspect that disputes and arbitration settlements have different effects on FDI flows from BIT partner countries and non-partner countries. Specifically, we hypothesize that BIT partners who previously relied on protection through FDI provisions react more strongly to disputes eroding their faith in effective protection than non-partners who never enjoyed BIT-related protection. Indeed, the case of El Salvador indicates that relevant insights are lost when considering only aggregate FDI inflows. The claim filed against the country by a Canadian mining company in April 2009 appears to have dampened FDI mainly from protected partner countries.[3] For instance, FDI trends diverged between Central American CAFTA partners (Costa Rica, Guatemala, Honduras, and Nicaragua) and non-partners in the region (Mexico and Panama).[4] FDI stocks held by regional partners in El Salvador were slightly lower at end-2010, compared to two years earlier, whereas FDI stocks held by Mexico and Panama increased by more than 40 percent.

By allowing for different reactions between protected and unprotected investors we wish to shed light on if and how (long) BITs actually work. If BITs attract FDI because investors believe that they offer some meaningful protection, then protected and unprotected investors should react differently to ISDS which provides new information on the effectiveness and reliability of investment provisions in BITs. Importantly, the distinction of protected and unprotected investors based in BIT partner countries and non-partner countries, respectively, also enables us to address the endogeneity of disputes and arbitration settlements. The above noted case of El Salvador exemplifies the relevance of accounting for endogeneity: Local governance conditions deteriorated well before the dispute emerged. The country's ranking with respect to the World Bank's Rule of Law indicator started to decline in 2005 already. This suggests that the filing of claims tends to be endogenous to a more general deterioration of the host country's investment climate, and ISDS is not necessarily causal for an observed decline in overall FDI inflows.

Our empirical analysis is based on bilateral FDI flows for a large panel of 83 host countries and 39 source countries, covering the period 1980-2010. This allows us to differentiate the reactions of foreign investors who are protected by a BIT (between their home country and the host country against which a claim is raised) from the reactions of foreign investors lacking such protection. At the same time, the dyadic approach helps mitigate endogeneity concerns. We reduce omitted variable bias by controlling for observable host- and source-country characteristics and by including country-pair fixed effects to account for unobserved heterogeneity. Our base specification also includes year dummies which, in combination with the country-pair fixed effects, allows us to estimate effects based on a difference-in-differences. In addition, the focus on different FDI reactions by protected versus unprotected investors - before and after a BIT-related claim is filed against a given host country - allows us to show the robustness of our findings to a full two-way fixed-effects specification which accounts for unobserved

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[3] For details on this case see:
https://icsid.worldbank.org/ICSID/FrontServlet?requestType=CasesRH&actionVal=showDoc&docId=DC2551_En&caseId=C661; bilateral FDI stock data are from UNCTAD.
[4] CAFTA stands for Central American Free Trade Agreement.

host-year as well as dyad heterogeneity. In these specifications we fully control for general changes in the host-country investment climate which might otherwise have biased our results.

We explain the theoretical predictions regarding the reaction of protected versus non-protected investors in the following section 2. In section 3, we discuss our empirical approach and data issues. Our empirical results are presented in section 4. Here we show that BIT participation stimulates bilateral FDI flows – but only so long as the host has not had a claim brought against it to arbitration. When a host faces a claim, FDI from sources with BITs in place falls significantly more than that from unprotected sources. Furthermore, the entry into force of new BITs has no significant impact on FDI flows after the host has faced at least one claim. Section 5 concludes.

2. How Protected and Unprotected Investors React to BITs and Disputes: Alternative Hypotheses

In the literature there is some debate about the primary means by which BITs might attract FDI.[5] We discuss three major functions in the following and derive three alternative hypotheses on the reactions of protected and unprotected investors to (i) the conclusion of BITs and (ii) the emergence of disputes and compensation claims. First, the "BITs as signals" hypothesis suggests that BITs signal a safe investment climate for investors based in both partner and non-partner countries. Second, the "BITs as deterrents" hypothesis assumes that foreign investors expect BITs to prevent the host country from breaching treaty obligations. Third, the "BITs as insurance" hypothesis assumes that investor behavior mainly depends on the expected compensation payments after a claim is filed against the host country.

Authors such as Neumayer and Spess (2005) argue that the primary function of BITs may be to signal a good – that is low political risk – investment climate. Accordingly, "the signing of BITs sends out a signal to potential investors that the developing country is generally serious about the protection of foreign investment" (Neumayer and Spess 2005: 1571). The signaling effect is thus expected to encourage investors from all source countries to increase their FDI engagement, independent of whether or not their specific home country has signed a BIT with the host country. The "BITs as signals" hypothesis seems to imply that the appropriate way of assessing the impact of BITs on the attractiveness of developing host countries is by considering aggregate FDI inflows. Arguably, studies which examine the impact of BIT participation on the basis of bilateral FDI inflows would underestimate the effectiveness of BITs by ignoring the host country's "willingness to protect all foreign investment" (ibid: 1572).

However, assessing the "BITs as signals" hypothesis on the basis of aggregate FDI inflows is likely to overstate the effectiveness of BITs unless the endogeneity of BIT formation is taken into account. Once a country improves its investment climate, it will also be more likely to participate in BITs. Consequently, it

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[5] Indeed, there is also substantial debate about whether BITs attract FDI at all. In addition to the mixed findings in the empirical literature linking BIT participation to increased FDI flows, surveys have shown that many investors were not aware of BITs or their potential (Yackee 2010; Skovgaard Poulsen 2015). Thus the theories about investor response presented here apply to that portion of investors (or their legal counsel) who were informed about BITs.

is hard for the econometrician to distinguish to what extent any resulting increase in FDI flows is due to the improved investment conditions, or due to BIT participation. The lack of adequate and valid instruments renders it still more difficult to establish causal effects of BITs on (aggregate) FDI inflows.[6] Earlier studies have often taken a minimalist approach of addressing endogeneity by lagging the explanatory variables, including the BIT dummy.[7] As we argue in more detail in section 3 below, a dyadic approach renders it easier to mitigate endogeneity concerns. At the same time, the use of bilateral FDI inflows does not prevent us from testing the "BITs as signals" hypothesis. Quite the contrary, this hypothesis has important implications when it comes to comparing the reactions of investors from BIT partner countries and non-partner countries. If the main causal impact of BITs is to signal a safe investment climate for all investors, FDI from BIT partner countries and FDI from non-partner countries should obviously react in essentially the same way to the conclusion of BITs. Likewise, if BITs were mainly regarded as meaningful indications that host countries treat all foreign investors well, we would expect a claim brought under a BIT to primarily affect investors' beliefs about the general level of political risk in the host country. Thus the "BITs as signals" hypothesis would suggest that both protected and unprotected investors should withdraw equally in response to a claim being registered against the host.

In contrast to the "BITs as signals" hypothesis, the two alternative hypotheses assume that unless BITs are costly for hosts with poor investment climates, they cannot act as signals. Specifically, BITs are understood to be more costly to politically risky hosts; otherwise, poor quality hosts could sign just as many BITs as safe hosts to attract FDI. These costs to the host are assumed to translate into benefits for protected investors. On this basis it is argued that if BITs have a causal effect, we should see a stronger increase in flows from the partner country than from other sources when a BIT is formed. This underscores that bilateral FDI data – which allows the econometrician to control for aggregate FDI increases for a given host and year – is the data type of choice for the most rigorous tests of the impact of BITs on FDI.

There is one important point which – to the best of our knowledge – has not been clarified in the literature to date, namely the exact nature of the benefits which investors supposedly perceive from BIT protection. Strict ISDS provisions now included in most BITs come into play here. They allow foreign investors to bring claims against the host country for breaches of obligations directly to international arbitration and to seek monetary compensation for resulting damages (Wälde 2005; Allee and Peinhardt 2010).[8] It follows that investors may benefit in two alternative ways from BITs: BITs either prevent treaty breaches, or they require hosts to pay compensation for treaty breaches. In other words, investors may either believe that the host is less likely to act adversely when a BIT is in force between the host and their home country ("BITs as deterrents" hypothesis). Alternatively, investors may believe that adverse

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[6] See Berger et al. (2013) for a short account of previous attempts to address endogeneity concerns in the literature on BITs and FDI. Kerner (2009) uses BITs signed by the source partner with neighboring hosts as an instrument for BIT formation. This instrument is, however, problematic due to the strong evidence of spatial correlation in FDI flows.

[7] Neumayer and Spess (2005: 1575) note that "to mitigate potential reverse causality problems, we lag all explanatory variables by one period." See also Allee and Peinhardt (2011).

[8] The effectiveness of various post-establishment obligations (e.g., lawful expropriation, minimum standard of treatment, transfer of funds) depends to a great extent on strict and binding ISDS provisions.

host actions will impair their profits less seriously because they will actually receive compensation ("BITs as insurance" hypothesis).

The distinction between these two potential sources of perceived benefits for investors has not been of relevance to the many studies which have attempted to identify the effects of BITs through changes in FDI flows around the time of BIT formation. It does, however, matter to us. The current study concerns itself with both the changes in FDI flows associated with BIT formation, and the changes associated with compensation claims against the host. The predicted impact of a compensation claim varies substantially depending on which of the two potential benefits of BIT protections dominates investor perceptions.

Consider first the case in which investors perceive the sole benefit of BIT protection to be that the threat of compensation claims will prevent the host from breaching the treaty. We call this the "BITs as deterrents" hypothesis. The argument that compensation rules affect the behavior of governments is well established in economic and legal theory. For instance, Miceli (1991: 356) refers to the "usual fear" that "the government will seize too much land" in the national context if no compensation would be required.[9] This reasoning carries over to international relations where compensation rules "help a host to make a credible commitment not to expropriate foreign investors' sunk assets, thereby helping to solve the hold-up problem" (Aisbett et al. 2010b: 4; see also Markusen 2001).[10]

For the sake of clarity, assume that in this case the investors perceive no benefit from the actual compensation the host would have to pay to them in the case that it did violate the investor's treaty rights. This is quite realistic considering the relatively low frequency with which investors actually receive substantial compensation net of the ISDS-related costs they have to bear.[11] Thus it is plausible to assume that treaty arbitration is simultaneously very costly to hosts and of no substantial benefit to investors. In this world, we would expect BIT formation to lead to an increase in FDI from the newly protected source country (over and above any increase in investment from other sources). However, when investors observe a claim being brought against a host under a BIT, they learn that BITs do not actually prevent that particular host from taking adverse actions against protected investors. Thus we would expect the claim to have a stronger negative impact on investment flows from protected sources than from non-protected sources. In the case where investors no longer perceive BITs provide them any protection in the particular host country, we would expect the magnitude of the additional negative impact for 'protected' hosts to be such that the net effect of having a BIT in force is zero. Furthermore, we expect future BITs ratified by that particular host to have a less positive effect on FDI flows (since investors have learned that BITs do not effectively constrain the behavior of this particular host). Again, in the limit where investors no longer perceive BITs provide them any protection in the particular host country, we would expect the net impact on bilateral FDI of a BIT coming into force to be zero.

[9] However, there is a trade-off according to this literature between "the risk of excessive regulation associated with no compensation" and "the moral hazard problem associated with full compensation for regulations" (Miceli and Segerson 1994: 750). In a similar vein, Aisbett et al. (2010a: 381) argue that "compensation is a tool for inducing efficient regulation," unless too high compensation prevents socially optimal regulation.

[10] According to the interviews conducted by Van Harten and Scott (2015) with government officials in the province of Ontario, Canada, ISDS provisions have changed the decision making on environmental issues.

[11] A review of arbitration decisions by UNCTAD (2008: XXV) revealed that "less than half of the awards rendered favored the claimant, and that damages awarded were considerably smaller than the total claims made by investors."

Now consider the second case, where investors believe that compensation requirements will not have any effect on host behavior, but will ensure that they receive compensation for treaty breaches. We call this the "BITs as insurance" hypothesis. Investors may believe that the compensation requirements will have little impact on host behavior if they think that the central government is incapable of controlling specific agencies (e.g., environmental regulator) or sub-national levels of government. In this case, a claim brought under a BIT may provide information that the host is more likely than previously believed to take adverse actions against foreign investors in general. Since the BIT was never expected to change the host's behavior specifically with regard to protected investors, a claim brought under a BIT does not change investors' beliefs about the relative treatment of protected and non-protected investors. This is a key difference between the "BITs as deterrents" and "BITs as insurance" hypotheses. Consequently, under the "BITs as insurance" hypothesis we would expect unprotected investors – who would receive no compensation should the host take an adverse action against them – to show a stronger negative reaction than protected investors to the announcement of an investor claim. Furthermore, in future, investment flows to this particular host may be even more sensitive to BIT formation.

3. Methodology, Sample and Data

Empirical Approach

In our empirical approach, we estimate an extension of the standard gravity-type model on the determinants of FDI. To avoid a sample section bias, we include as many source and host countries as possible and a relatively long time-series. Using annual data at a bilateral level implies that many FDI observations are zero or not reported, and some are negative.[12]

Given our focus on the negative effects of compensation claims against hosts, it is particularly important that we utilize the information contained in all the data. Therefore, the dependent variable is the inverse hyperbolic sine (IHS) transformation of the bilateral FDI flows (in $US '000), with non-reported flows assumed to be zero. The IHS transformation, described in Burbidge et al. (1988), reduces the influence of extreme values in a way similar to the popular log transformation, but the IHS transformation has the advantage of allowing zero and negative inputs.

Our base-model specification reads as follows:

$$(1) \quad g(\text{FDI}_{ijt}) = f(\alpha_1 \text{BIT in force}_{ijt} + \alpha_2 \text{Claim against host}_{jt} + \alpha_3 \text{Claim with BIT}_{ijt}$$
$$+ \alpha_4 \text{BIT after claim}_{ijt} + \gamma' X_{it} + \phi' X_{jt} + \lambda_t + \alpha_{ij} + \varepsilon_{ijt})$$

where *FDI$_{ijt}$* stands for FDI flows from country *i* to country *j* at period *t*, *BIT in force$_{ijt}$* represents a dummy variable if a bilateral investment treaty is in force, *Claim against host$_{jt}$* is a dummy indicating whether the host country has ever faced a claim brought under a BIT to investor-state dispute settlement, *Claim with BIT* indicates that there was a BIT in force between the members of the dyad at the time that the first

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[12] Almost 70% of all observations in our sample are zeros, 6% are negative.

claim was brought against the host,[13] while *BIT after claim* is a dummy indicating that a BIT came into force for that dyad either concurrently or after the host had already faced an investor claim.[14] The matrices X_{it} and X_{jt} represent a set of time-varying source and host country control variables, including the cumulative number of BITs ratified by the host country (with source countries included in our sample), λ_t is a set of year dummies, α_{ij} stands for country-pair fixed effects, and ε_{ijt} represents the error term.

Aside from the claim-related variables, the model specification in equation 1 is similar to that used by several of the more rigorous papers on the impact of BITs on FDI (e.g. Hallward-Driemeier 2003; Aisbett 2009; Berger et al. 2013), and it makes a valiant attempt to reduce omitted variable bias. Observable host- and source-level determinants of FDI (e.g. GDP) are included in the matrices X_{it} and X_{jt}. The country-pair fixed effects capture all the characteristics of host-source dyads which may affect their FDI relationship as well as the probability of BIT formation. Country-pair fixed effects also mean that any time-invariant country characteristics are controlled for – including those which may affect both FDI flows and the probability that the country has a compensation claim lodged against it for violation of a BIT. Finally, year dummies control for global trends such as the rises and falls in FDI flows, the growth in compensation claims and changes in the popularity of BITs. Together the dyad and year "fixed effects" produce a difference-in-difference estimator.

Valiant as these attempts to control for omitted variable bias may be, they are not perfect. Of particular concern for the current study, is the remaining potential for omitted time-varying factors which affect both the FDI flows and the probability of a compensation claim against the host. For example, if a country is becoming less investor-friendly, it is also more likely to get a claim against it. This means that it is difficult to know the extent to which the coefficient on the claim is capturing the effects of the claim itself, or is acting as an indicator of the general change in attitude toward foreign investors. This omitted variable problem will lead to a downward bias on the claim variable coefficient.

The less obvious source of endogeneity is reverse causality, from higher FDI flows to higher probability of the host violating the treaty. For a host with a given probability of violating a treaty in a way which will lead to an compensation claim, then the probability of such a claim will be increasing with the number (or value) of investment in the host. Furthermore, when hosts are desperate for FDI, they will tend to offer good conditions to attract it. However, if circumstances change (for example due to agglomeration economies or an increase in the value of raw materials which the country exports), then the host may decide it wishes to capture a greater portion of the surplus being generated by the FDI. There are examples of this sort of behavior even in high income hosts, such as when the United States raised oil royalties and Australia tried to implement a mining super-profits tax in the early 2000s. This form of endogeneity will lead to a positive bias on the claim coefficient. In light of the two countervailing sources of endogeneity, it is difficult even to predict on balance which direction the claim coefficient will be biased. Such endogeneity bias is particularly problematic for studies which identify the effects of claims only at the host-year level.

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[13] This variable is set equal to 1 if there is a BIT in force and a claim against the host, and the date of first claim against the host is equal to or later than the date of entry of the BIT into force.
[14] This variable is set equal to 1 if there is a BIT in force and a claim against the host, and the date of first claim against the host is earlier than the date of entry of the BIT into force.

One of the advantages of our theoretically motivated approach is that the testable implications of our three alternative hypotheses in section 2 suggest specific patterns of differences between protected and unprotected investors in a given host country and year. For example, the "BITs as deterrents" hypothesis predicts that: having a BIT in force should increase investment from the partner country over and above any increase from other sources; a BIT claim against the host should decrease investment from protected sources (i.e. those with a BIT in force) more than from non-protected sources; and BITs which come into force after a host has had a BIT claim against it should have a less positive effect on FDI flows. We are not aware of any intuitively plausible source of endogeneity which would predict this particular pattern of results.

Indeed, the fact that our main hypotheses relate to variables with variation at the dyad-year level means that it is technically possible to completely eliminate host-year effects. We show that our results are robust to this approach by creating a two-way fixed effects estimator in which the dependent variable is differenced not only from the average over time for each dyad (i.e. standard country-pair fixed effects), but also from the average across source countries for each host-year (creating host-year fixed effects). Thanks to our particularly comprehensive dataset there remains sufficient identifying variation in our data to identify effects even with this highly conservative specification.

We also show that our results are robust to a number of different checks, including controlling for compensation claims from investors of the specific source country in the dyad; controlling for additional source-year effects; and excluding post-socialist countries in Central and Eastern Europe and the former Soviet Union (EEC countries) from the sample.

Data and Sample

In order to test our hypotheses, we need data on the claims brought against host countries using the ISDS provisions in BITs. We collected this data by "scraping" it directly from the ICSID website. The dummy variable *Claim against host* created on the basis of ICSID data is set to one when the first claim has been brought against a host country. We employ a fairly standard set of controls, including GDP of the source and host country (*Source Log of GDP* and *Host Log of GDP*, respectively).[15] We also control for host country inflation (*Host Inflation*), the level of the exchange rate of the host country against the US dollar (*Host Exchange Rate*), and host country openness to trade measured as the share of exports plus imports in GDP (*Host Openness*). We then add two dummies, one indicating the members of the dyad are both members of the same preferential trade agreement (PTA), and the other indicating they have a double taxation treaty (DTT) in force. PTA data was taken from the WTO's website, and DTT data from UNCTAD's website.

Our analysis covers the period 1980-2010. UNCTAD's Data Extract Service provides FDI data since 1970, but very few countries report FDI flows for the 1970s at a bilateral level. We begin in 1980 to circumvent any biases arising from a particularly small sample of reporting countries. We include all source countries

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[15] See Appendix A for exact definitions and data sources for all variables. Descriptive statistics can be found in Appendix B.

and non-high income[16] host countries for which bilateral FDI flows (and information for the controls) are available, except financial offshore centers, such as the Bahamas or the Cayman Islands.[17] Our full sample consists of 39 source countries and 83 host countries. We include various non-OECD source countries to capture the recent surge in FDI flows from non-traditional source countries.[18]
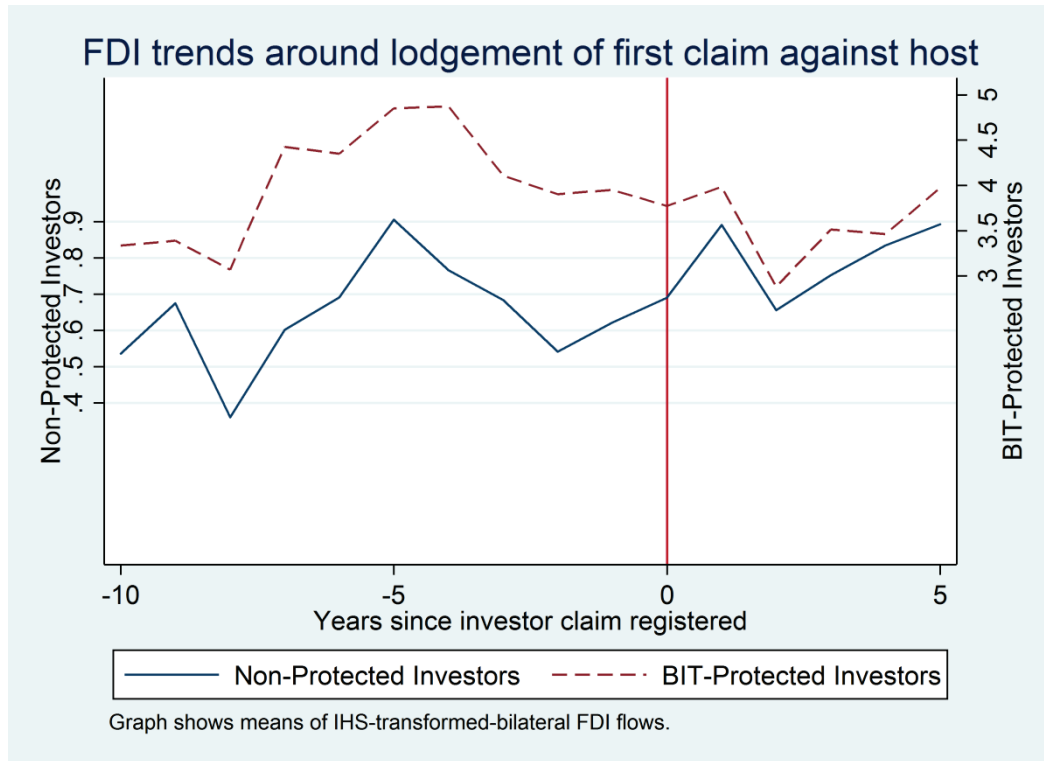
4. Results

Graphical Analysis

Before presenting the formal regression results, we begin with an illustration which provides a visual overview of our key finding. Figure 1 shows an "event study" of the (IHS transformed) FDI flows lined up relative to the year that the first BIT claim against the host (if any) was registered. The red-dashed line is the mean of the transformed flows for all dyads which have a BIT in force for the entire period shown in the figure (from ten years before the first claim). The blue-solid line is the equivalent mean for dyads which do not have a BIT in force at any time in the event study window (up to five years after the first claim against the host). Figure 1 clearly illustrates that the negative impact of the compensation claim is concentrated on the FDI from BIT partners - whose FDI flows fell considerably relative to those of non-BIT partners around the time a claim was registered. This provides the first piece of evidence supporting the "BITs as deterrents" hypothesis from section 2.

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[16] We excluded host countries which were classified as "high-income" according to the World Bank's World Development Indicators for more than half our sample period. This follows most studies on the impact of BITs on the host countries' attractiveness to FDI.

[17] The FDI data for financial offshore centers are highly likely to be biased. We exclude all countries that are on the list of offshore financial centers as reported by Eurostat (2005).

[18] See Appendix C and Appendix D for the source and host country samples.

Figure 1: Comparing FDI trends for BIT-protected and non-protected sources around time of first BIT-claim against host

Graph shows means of IHS-transformed-bilateral FDI flows.

Regression Analysis

Table 1 presents our main regression results. Before considering the formal evidence regarding our hypotheses in section 2, we first check that our sample and econometric approach provide results comparable to those in previous studies. Thus in column 1 we include the *BIT in force* variable, but no variables related to claims against the host. The estimated coefficient on *BIT in force* is 0.16 and not significant at the 10% level. For coefficients between zero and one, and for reasonably large values of the dependent variable, the coefficients in our regression using the IHS transformation of the raw FDI flow can be interpreted as proportional changes in the same way as the coefficients on dummies in a standard log-linear specification can be. This suggests the magnitude of the effect of a BIT is on average around 16%, which is close to the average estimate from the existing literature. The fact that this effect is not statistically significant is also consistent with some (but not all) previous studies.

Table 1: Impacts of BITs in force and first claim again host on FDI bilateral flows to non-high income countries: Two-way fixed effects models

	(1)	(2)	(3)	(4)
BIT in force	0.168	0.224	0.469***	0.424***
	(0.151)	(0.153)	(0.168)	(0.157)
BIT after claim			-0.949***	-0.718*
			(0.366)	(0.378)
Claim against host		-0.372***	-0.0207	
		(0.123)	(0.129)	
Claim with BIT in-force			-0.641***	-0.375*
			(0.235)	(0.192)
PTA	0.311	0.360	0.436	0.334
	(0.285)	(0.283)	(0.280)	(0.272)
DTT	0.205	0.232	0.256	0.252
	(0.198)	(0.197)	(0.197)	(0.180)
Host total BITs	0.0288***	0.0309***	0.0305***	
	(0.00617)	(0.00616)	(0.00611)	
Host Log of GDP	0.423***	0.422***	0.424***	
	(0.111)	(0.111)	(0.111)	
Host Exch. Rate	-0.0000165	-0.0000282	-0.0000346	
	(0.0000572)	(0.0000568)	(0.0000566)	
Host Openness	0.00124	0.00154	0.00154	
	(0.00228)	(0.00226)	(0.00226)	
Host Inflation	-0.000164	-0.000157	-0.000148	
	(0.000129)	(0.000129)	(0.000128)	
Source Log of GDP	0.235	0.198	0.182	0.189
	(0.149)	(0.148)	(0.148)	(0.140)
Constant	-15.16***	-14.20***	-13.88***	-4.682
	(4.321)	(4.301)	(4.296)	(3.532)
Observations	58233	58233	58233	60495
Dyad FE	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	No
Host-year FE	No	No	No	Yes

Cluster-robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

In column 2 of Table 1 we begin to examine the impact on FDI flows of the host having experienced at least one compensation claim under a BIT (where the claim can arise under any existing BIT, not only from the investors from the source country in the dyad). Here we observe a negative, statistically and economically significant impact of such a claim on bilateral FDI flows. This result is similar to the finding of Allee and Peinhardt (2011). In itself it is consistent with any of the three causal hypotheses presented in section 2, but it is also open to the same potential endogeneity concerns as Allee and Peinhardt's results.

In column 3 we move beyond the basic analysis by including two interaction terms, *Claim with BIT in force* and *BIT after claim*, as defined in section 3 (see equation (1)). The first indicates whether there was a BIT in force for the pair at the time the first compensation claim against the host was lodged. The second interaction term indicates whether the host already had faced a claim at the time the BIT (if any)

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came into force. These interaction terms allow us to distinguish between the predictions of the three hypotheses introduced in section 2. Consistent with Figure 1, the results in column 3 support the "BITs as deterrents" hypothesis.

Recall from section 2 that the "BITs as deterrents" hypothesis predicted that: BITs signed before the host has a claim against it should have a positive impact on bilateral FDI flows, (i.e. the coefficient on *BIT in force* should be positive); the first claim should have a stronger negative impact on FDI flows from protected sources than from non-protected sources (*Claim with BIT in force* should enter negatively); and BITs which enter into force after the first claim against a host should have a less positive impact on bilateral FDI flows (*BIT after claim* should also enter negatively). Furthermore, the strong version of the "BITs as deterrents" hypothesis – in which a claim against the host completely negates the advantage investors perceived from BIT protection – predicts additionally that: the sum of the coefficients on *BIT in force* and *Claim with BIT in force* should be zero; and the sum of the coefficients on *BIT in force* and *BIT after Claim* should be zero.

The results in column 3 are consistent with the above predictions for the strong version of the "BITs as deterrents hypothesis". To begin, we see that the non-interacted impact of BIT formation is now larger and statistically significant. It suggests that BIT formation is associated with a substantial increase in bilateral FDI flows for hosts which have not previously violated a BIT. Secondly, we see that the coefficients on both interactions terms – *Claim with BIT in force* and *BIT after claim* – are negative. Finally, the magnitudes of the coefficients are such that – once a host has faced a claim – neither existing BITs nor new BITs increase bilateral FDI flows.[19]

Column 4 of Table 1 presents the results of our most conservative specification. Here, we drop the year dummies from the specification and instead construct a dependent variable which is the deviation of the IHS transformed variable from its host-year mean. To this variable we then apply the standard dyadic fixed-effects transformation, resulting in a two-way fixed effects model which controls for both time-invariant dyadic heterogeneity as well as host-year effects. In this specification we can no longer estimate the overall effect of the host having a claim against it, but we can still estimate the effects of our key variables of interest. Even in this very conservative specification, the coefficients on the BIT in force variable and the two BIT-claim interaction terms remain statistically significant with the signs predicted by the "BITs as deterrents hypothesis."[20] More broadly, the finding that BITs provide a significant boost to the bilateral FDI relationship if and only if the host has not faced a dispute is robust to this highly conservative specification.

Careful observers of the literature on the impact of BIT participation on FDI flows will have noticed that papers which find a statistically significant impact of BIT participation tend to include post-socialist countries in their sample, while papers which exclude these countries and focus on more traditionally

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[19] Specifically, neither the sum of the coefficients for *BIT in force* and *Claim with BIT in force*, nor the sum of the coefficients for *BIT in force* and *BIT after claim* is positive. Thus, if anything, the sums suggest a slightly negative net impact of BITs for hosts which have faced claims.

[20] The magnitude of each of the variables is, however, somewhat diminished. This is consistent with the idea that controlling for host-year effects reduces endogeneity bias. For example Aisbett (2009) has argued that hosts which have increasing FDI inflows are more likely to form BITs. Similarly, in the current paper we have argued that claims against hosts are likely to be associated with general decreases in FDI flows due to a worsening investment climate.

defined developing countries do not (e.g. Aisbett 2009, Busse et al. 2010; Berger et al. 2011). This is problematic, since the transition from socialist regimes represented a very special case where massive changes were occurring at the same time as a large number of BITs were being signed. To check that our results are not being driven by these countries, we exclude them from the sample in the regressions presented in Table 2.

Table 2: Impacts of BITs in force and first claim again host on FDI bilateral flows to non-high income, non-EEC countries: Two-way fixed effects models

	(1)	(2)	(3)	(4)
BIT in force	0.0395	0.107	0.382**	0.344**
	(0.166)	(0.168)	(0.184)	(0.174)
BIT after claim			-0.853**	-0.610
			(0.403)	(0.415)
Claim against host		-0.424***	0.0495	
		(0.142)	(0.154)	
Claim with BIT in-force			-0.935***	-0.538**
			(0.276)	(0.226)
PTA	0.305	0.358	0.421	0.275
	(0.312)	(0.310)	(0.307)	(0.304)
DTT	0.328	0.354	0.374	0.392*
	(0.234)	(0.232)	(0.232)	(0.214)
Host total BITs	0.0252***	0.0280***	0.0282***	
	(0.00698)	(0.00699)	(0.00692)	
Host Log of GDP	0.558***	0.526***	0.527***	
	(0.126)	(0.126)	(0.125)	
Host Exch. Rate	-0.0000280	-0.0000393	-0.0000476	
	(0.0000579)	(0.0000575)	(0.0000573)	
Host Openness	0.00434*	0.00423*	0.00426*	
	(0.00246)	(0.00245)	(0.00245)	
Host Inflation	-0.000231	-0.000230	-0.000234	
	(0.000145)	(0.000145)	(0.000145)	
Source Log of GDP	0.184	0.144	0.119	0.161
	(0.163)	(0.161)	(0.161)	(0.154)
Constant	-17.10***	-15.31***	-14.71***	-4.027
	(4.732)	(4.674)	(4.657)	(3.869)
Observations	50199	50199	50199	51891
Dyad FE	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	No
Host-year FE	No	No	No	Yes

Cluster-robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Consistent with the previous literature, the impact of having a BIT in force estimated in column 1 of Table 2 is smaller than that estimated in Table 1 for the sample including the post-socialist countries.[21] Importantly for us, however, the coefficients and standard errors in column 4 of Table 2 are close to

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[21] This difference is not statistically significant since neither coefficient is itself significantly different from zero.

those in Table 1.[22] This demonstrates both the generality of the effects we are observing, and the effectiveness of our most conservative specification in eliminating biases due to other concurrent changes in the host country's investment climate.

Table 3: Robustness to additional controls for source-country effects and number of claims effects

	(1)	(2)	(3)	(4)
BIT in force	0.523***	0.468***	0.361**	0.530***
	(0.166)	(0.150)	(0.153)	(0.154)
Claim against host	0.0788			-0.163
	(0.139)			(0.121)
BIT after claim	-0.965***	-0.787**	-0.736**	-0.910***
	(0.372)	(0.373)	(0.371)	(0.336)
Claim with BIT in-force	-0.670***	-0.451**	-0.465**	-0.523**
	(0.238)	(0.189)	(0.191)	(0.219)
PTA	0.425	0.330	0.281	0.377
	(0.279)	(0.268)	(0.273)	(0.250)
DTT	0.276	0.231	0.235	0.265
	(0.195)	(0.180)	(0.183)	(0.180)
Host total BITs	0.0309***			0.0212***
	(0.00605)			(0.00493)
Host Log of GDP	0.412***			0.0409
	(0.109)			(0.0623)
Host Exch. Rate	-0.0000405			-0.0000492
	(0.0000569)			(0.0000511)
Host Openness	0.00139			-0.00244
	(0.00223)			(0.00185)
Host Inflation	-0.0000712			-0.000241**
	(0.000132)			(0.000114)
Source Log of GDP	0.186	-0.0603	-0.441***	
	(0.148)	(0.0503)	(0.160)	
Annual claims against host	-0.158**			
	(0.0667)			
Cumulative claims against host	-0.0124			
	(0.0200)			
Source annual claims against host		-0.621		
		(0.603)		
Source cumulative claims against host		0.0149		
		(0.141)		
Source GDP growth			-0.0122**	
			(0.00495)	
Source Inflation			0.000178	
			(0.000147)	
Source Log of GDPpc			0.242	
			(0.350)	
Source Log Exports			-0.447***	
			(0.159)	
Source Log Imports			0.707***	
			(0.194)	
Constant	-13.71***	1.452	2.741	-1.266
	(4.250)	(1.323)	(1.855)	(1.435)
Observations	58233	60495	58370	58306
Dyad FE	Yes	Yes	Yes	Yes
Year Dummies	Yes	No	No	No
Host-year FE	No	Yes	Yes	No
Source-year FE	No	No	No	Yes

Cluster-robust standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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[22] However, the slight decrease in magnitude and increase in standard error of the coefficient on *BIT after claim* in column (4) of Table 2 renders it no longer significant at the 10% level.

Returning to the full sample of host countries, we perform several robustness tests in Table 3 by extending and modifying the specification of the estimations shown in columns 3 and 4 of Table 1. In columns 1 and 2 of Table 3, we include additional claim-related variables: the number of all claims against a host country in a given year and the accumulated number of all claims against the host country in column 1; and a dummy variable set to one if the BIT partner in a specific host-source pair files a claim plus the accumulated number of claims filed by this particular source country in column 2. Of these four additional claim-related variables, only the number of all claims against a host country in a given year has a statistically significant (negative) effect. Importantly, the coefficients on our variables of principal interest are hardly affected in the extended specification so that the "BITs as deterrents" hypothesis continues to be strongly supported. Our major results also hold in columns 3 and 4 of Table 3 where we include additional control variables at the source-country level (column 3),[23] or replace host-year fixed effects by source-year fixed effects (column 4).

5. Summary and Conclusion

Policymakers in various developing countries traditionally regarded BITs as a means to attract higher FDI inflows. The empirical evidence supporting their beliefs has remained ambiguous at best. Furthermore, it has become increasingly clear that the conclusion of BITs can give rise to costs going beyond the deliberately constrained policy discretion associated with tying one's own hands. BIT-related costs go even beyond the investors' claims for compensation, which have received more public attention since the recent boom of investor-state disputes and various controversial settlements by international arbitration panels. In contrast to the intensifying discussion on the "broad and asymmetrical rights" (Simmons 2014) for private foreign investors and the insufficient capacity of host countries to counter the investors' claims effectively, it has received scant attention so far that the host countries are likely to incur significant additional costs in terms of reduced FDI inflows after claims are filed against them.

Our analysis corroborates the finding of Allee and Peinhardt (2011) that FDI flows to developing host countries decline significantly after investor claims for compensation are filed against them and international arbitration is sought through ICSID panels. This leads to a first important, though fairly general, policy implication, namely that the potential costs of dispute settlement provisions should no longer be ignored when engaging in BIT negotiations. In particular, small and poor host countries may need considerable technical support by international organizations such as UNCTAD to strengthen their expertise and improve their bargaining position vis-à-vis highly developed source countries when it comes to designing increasingly complex and binding investment provisions in BITs (and other IIAs).

Our analysis extends previous work by Allee and Peinhardt (2011) in several important dimensions. First of all, we make a methodological contribution by explicitly addressing the endogeneity of BIT-related claims for compensation. The case of El Salvador, alluded to in the Introduction, reveals the relevance of our argument that the filing of claims could be endogenous to a more general deterioration of the host

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[23] Specifically, we include the source country's GDP growth, inflation rate, GDP per capita, and its exports and imports. GDP growth in the source country is negatively associated with bilateral FDI flows, suggesting investors look overseas for profitable opportunities when such opportunities are fewest at home. Imports and FDI flows appear to be complementary, consistent with the rising importance of global supply chains.

country's investment climate. This implies that the appearance of violations of treaty obligations is not necessarily causal for an observed decline in overall FDI inflows after claims are filed.

Consequently, we do not focus on aggregate FDI flows as Allee and Peinhardt (2011), but rather on the differences in the reactions of distinct sub-groups of foreign investors to BIT-related disputes. We distinguish between protected foreign investors based in BIT-partner countries and unprotected foreign investors based in non-BIT partner countries. Considering alternative hypotheses on the reactions of protected and unprotected investors to the conclusion of BITs and the filing of BIT-related compensation claims, we find strong and robust support to what we labelled the "BITs as deterrents" hypothesis. According to this hypothesis, investors perceive the principle advantage of their home country having a BIT in force with the host is that it will deter the host from taking adverse actions against them; but the emergence of a dispute which must be settled by arbitration informs investors that BITs are not an effective deterrent for this particular host.

Several predictions which arise from the "BITs as deterrents" hypothesis are supported in our data. First, BITs signed prior to a dispute between the host country and any source country have a positive impact on bilateral FDI flows. Second, FDI flows from BIT-partners decrease more strongly following a dispute than those from unprotected sources. Third, the FDI boost a host receives from ratifying BITs is reduced once it has experienced at least one claim against it. Indeed, the magnitudes of the observed effects suggest that investors no longer perceive BITs provide them any meaningful protection in a host country after a claim has been filed against it. The negative reaction to a claim completely offsets the earlier BIT-induced increase in bilateral FDI flows; and the net impact on bilateral FDI of any new BIT coming into force after a dispute is essentially zero.

All in all, our results suggest that BITs do have a causal positive impact on FDI flows, but only for hosts who have not had a BIT claim brought to arbitration. This finding could help explain why hosts which have faced compensation claims are reluctant to continue signing new BITs and other IIAs and – as in the case of many Latin American countries and South Africa – are even calling the legitimacy of the whole system into question.

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Appendix A: Definition of Variables and Data Sources

Variable	Definition	Source
FDI	Bilateral FDI flows from source to host country in current (1,000) US$.	UNCTAD (2014a)
IHS of FDI	The inverse hyperbolic sine transformation of FDI is given by $\log(FDI + (FDI^2 + 1)^{1/2})$.	Own calculation
BIT in force	Dummy variable, set equal to one in the case of a bilateral investment treaty in force between source and host country.	UNCTAD (2014b)
Claim against host	Dummy variable, set equal to one in the case a claim has been brought against the host.	World Bank (2015)
BIT after claim	Dummy variable, set equal to one if there is a BIT in force and a claim against the host, and the date of first claim against the host is earlier than the date of entry of the BIT into force.	Own calculation
Claim with BIT in force	Dummy variable, set equal to one if there is a BIT in force and a claim against the host, and the date of first claim against the host is equal to or later than the date of entry of the BIT into force.	Own calculation
PTA	Dummy variable, set equal to one if there is any preferential trade agreement between host and source country.	World Trade Organization (2015)
DTT	Dummy variable, set equal to one if there is any double taxation treaty ratified between host and source country.	UNCTAD (2015b)
Host total BITs	Total number of bilateral investment treaties the host participates in.	Own calculation
Host Log of GDP	Log of host country GDP in current US$.	World Bank (2014), data for ARG and TWN from Penn World Table 8.0
Host Exch. Rate	Host country official exchange rate (LCU per US$, period average).	World Bank (2014), data for TWN, TKM and UZB from Penn World Table 8.0
Host Openness	Host country merchandise trade (% of GDP).	World Bank (2014)
Host Inflation	Host country GDP deflator (base year varies by country).	World Bank (2014)
Source Log of GDP	Log of source country GDP in current US$.	World Bank (2014), data for ARG from Penn World Table 8.0
Annual claims against host	Number of claims against host country in given year.	Own calculation
Cumulative claims against host	Total number of claims that have been brought against host country up to and including the given year.	Own calculation
Source annual claims against host	Number of claims against host country in given year brought by investors from the source country.	Own calculation
Source cumulative claims against host	Total number of claims that has been brought against host country up to and including the given year by investors from the source country.	Own calculation
Source GDP growth	Source country GDP growth (annual %).	World Bank (2014), data for ARG from Penn World Table 8.0
Source Inflation	Source country GDP deflator (base year varies by country).	World Bank (2014)
Source Log of GDPpc	Source country GDP per capita (constant 2005 US$).	World Bank (2014), data for ARG from Penn World Table 8.0
Source Log of Exports	Log of source country merchandise exports (current US$).	World Bank (2014)
Source Log of Imports	Log of source country merchandise imports (current US$).	World Bank (2014)

Appendix B: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
IHS of FDI	60572	1.39	4.87	-16.88	17.57
BIT in force	60572	0.25	0.43	0	1
Claim against host	60572	0.20	0.40	0	1
BIT after claim	60572	0.02	0.14	0	1
Claim with BIT in force	60572	0.10	0.30	0	1
PTA	60572	0.15	0.35	0	1
DTT	60572	0.26	0.44	0	1
Host total BITs	60572	17.6	18.1	0	100
Host Log of GDP	60028	23.74	1.76	18.99	29.74
Host Exch. Rate	59834	520.83	1939.59	9.33e-12	20828
Host Openness	58894	60.28	31.09	5.00	203.04
Host Inflation	59129	209.53	416.82	1.75e-12	4004.39
Source Log of GDP	60495	26.64	1.45	22.44	30.42
Annual claims against host	60572	0.11	0.67	0	21
Cumulative claims against host	60572	0.76	3.39	0	48
Source annual claims against host	60572	0.0035	0.08	0	6
Source cumulative claims against host	60572	0.03	0.34	0	17
Source GDP growth	60495	3.08	3.65	-14.61	29.28
Source Inflation	58370	123.15	186.69	.0013	2663.21
Source Log of GDPpc	60572	9.80	0.97	6.78	11.38
Source Log of Exports	58370	25.21	1.37	21.05	28.35
Source Log of Imports	58370	25.21	1.38	21.02	28.48

Appendix C: Source Country Sample

Argentina (1992-2010), Australia (1992-2010), Austria (1985-2010), Belgium (2002-2010), *Brazil (1992-2010)*, Canada (1980-2010), Chile (1992-2010), *China (2003-2010)*, *Colombia (1992-2010)*, Denmark (1985-2010), Finland (1985-2010), France (1986-2010), Germany (1980-2010), Greece (2003-2010), Iceland (1988-2010), Ireland (2001-2010), Israel (2001-2010), Italy (2001-2010), Japan (1980-2010), Republic of Korea (1990-2010), Luxembourg (2002-2010), *Malaysia (1980-2010)*, *Mexico (1990-2010)*, Netherlands (1982-2010), New Zealand (1980-2010), Norway (1986-2010), Poland (1996-2010), Portugal (1990-2010), Russia (2007-2010), *South Africa (2001-2010),* Spain (1992-2010), Sweden (1982-2010), Switzerland (1993-2010), Chinese Taipei (1980-2010), *Thailand (1980-2010)*, *Turkey (2000-2010)*, United Kingdom (1985-2010), United States (1982-2010), *Venezuela (1990-2010)*

Note: Developing source countries in *italics* (World Bank (2014) classification). In brackets: time span over which FDI data are available for the particular source country.

Appendix D: Host Country Sample

Albania, Algeria, Angola, Argentina, Armenia, Azerbaijan, Bangladesh, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cameroon, China, Colombia, Democratic Republic of Congo, Republic of Congo, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, Gambia, Georgia, Ghana, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Macedonia, Madagascar, Malaysia, Mali, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Rwanda, Senegal, Seychelles, South Africa, Sri Lanka, Sudan, Swaziland, Syria, Taiwan, Tanzania, Thailand, Togo, Tunisia, Turkey, Turkmenistan, Uganda, Ukraine, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia, Zimbabwe