Regulating Foreign Investment: Bilateral Investment Treaties, Investment Risk, and the Reallocation of FDI

Pablo M. Pinto* Santiago M. Pinto† Nicolás E. Stier-Moses‡

November 9, 2016

Abstract

We model the formation of the international investment regime as a network formation process where nodes (countries) choose which arcs to add (treaties to sign). The provisions of investment treaties are modeled as an enforcement technology that has the potential to increase the returns, and reduce the costs and risk of investing abroad. We model investment decisions as a mean-variance optimization process, explicitly accounting for the home-country bias in investment documented in the empirical literature. In deciding which treaties to sign, governments internalize the potential aggregate and distributive consequences of inward and outward investment. Signing investment treaties affects the mean and variance of the return to investment among signatory, and non-signatory parties. In equilibrium –when all potentially beneficial agreements have been signed and the network reaches a level of saturation– the signing and ratification of BITs would be consistent with a limited reallocation of investment capital across countries (or no reallocation of investment if BIT signing is defensive). Yet, we also predict that BITs are consequential: they are likely reduce investment and increase returns on investment to multinational firms, outcomes that are hard to observe. To test this prediction we develop a structural estimator that uses the observed allocation of FDI to estimate the variance of returns and expected returns to investment in the presence of BITs. We find that the allocation of investment is consistent with lower risk (and higher returns) in the presence of BITs. Our model and empirical strategy help explain the contradictory results in the empirical literature on the effects of BITs on FDI flows.

*University of Houston, ppinto@central.uh.edu

†Federal Reserve Bank of Richmond, Santiago.Pinto@rich.frb.org

‡Universidad Torcuato Di Tella, nstier@utdt.edu

1 Introduction

Why do countries sign bilateral investment treaties (BITs)? Following a profuse literature on the subject we argue that governments are driven by the expected impact of treaties on the return and risk faced by their nationals when engaging in direct investment abroad. Historically the provisions governing foreign investment emanated from customary law or from investment provisions added as ancillary documents to trade agreements, such as the provisions under chapter 4 of Title III of the Treaty of Rome, or NAFTA's Chapter 11. Yet most of the international agreements to date take the form of BITs. According to UNCTAD, at the end of 2008 the cumulative number of BITs signed was 2,676.[1] Most BITs involve a developed country, usually the source of direct investment, and a developing country.[2] In recent years, however, the number of investment agreements between developing countries is increasing.[3]

Investment agreements have provisions regarding admission and conditions for investment, grant national treatment, and establish arbitration mechanisms (Sauvant & Sachs 2009; UNCTAD 2009). Investor protection is thus a central feature of these agreements.[4] Over the past decade there has been a dramatic increase in the number of BITs signed, while most multilateral initiatives failed (Kobrin 1998). Studies aimed at identifying the correlates and determinants of BIT signing present contradictory conclusions, and there is a big controversy about their effects (Rose-Ackerman & Tobin 2005; Neumeyer & Spess 2005; Elkins et al. 2006; Jandhyala et al. 2008; Buthe & Milner 2008, 2009; UNCTAD 1998, 2009). In the end there is a growing consensus that the impact of BITs is not sizable, and there is "that host-country market-size variables remain the dominant factor for inward FDI" (UNCTAD 2009, pp. xiii). This limited impact of BITs on investment flows contrasts with the proliferation of bilateral investment agreements in recent years. If BITs have limited effect, why sign them?

[1] `http://www.unctad.org/en/docs/webdiaeia20098_en.pdf`

[2] The most active BIT signatory party is Germany with 135 agreements signed, followed by China (119), Switzerland (114), the United Kingdom (103), Egypt (100), Italy (100), France (98), the Netherlands (91), Korea (86) and the Belgium-Luxembourg Economic Union (84). See UNCTAD 2009; Sachs and Sauvant 2009, pp. xxxv.

[3] This may coincide with some emerging markets becoming a source of direct investment: according to UNCTAD 2007, emerging markets account for about one fourth of the world's FDI stock under BITs (Sachs and Sauvant 2009, pp. xxxiv-xxxv). Yet there are also many instances of unlikely partners signing BITs; see Jandhyala et al. 2008.

[4] In recent years the US and Canadian model BITs go beyond investor protection, requiring specific efforts at liberalizing investment regimes as well.

This paper aims at reconciling the contradictory results of BITs on investment activities and the proliferation of investment agreements. We bring forth the main economic properties of BITs to develop a formal model of the investment protection network. Our model is built on specific assumptions about the impact of BITs that motivate the extant empirical literature on the political economy of FDI. Namely, whether BITs liberalize investment environment, thus increasing the return of investing in a host country, or reduce risk of investing abroad by allowing investors to resort to international arbitration. To the extent that these are the main properties of bilateral investment agreements their effect would be reflected in increasing returns to investors and lowering the risk of investing in a host country. If governments are predisposed to sign BITs in response to competitive pressures created by the quest for foreign investment—as assumed in the literature and supported by empirical evidence—in the long run we should expect to see a drop in risk and possible an increase in the return to FDI.[5]

However, in the long-run we would not observe a change in the allocation of direct investment when all 'potentially beneficial' BITs have been signed, i.e.: when the BIT network approaches its stage of saturation.[6] We could expect some transitional changes in the allocation of capital in favor of countries that are BIT signatories in the transition to that stage. If riskier countries are more likely to sign BITs, the effect will be more pronounced within countries over time. These predictions seem to be borne out in preliminary tests using outward direct investment data for the United States from 1970-2006. By modeling the properties of the possible agreements, and the strategic interaction among investors, home and host governments, we are able to explain the absence of a clear association between BITs and the allocation of investment across countries in the empirical literature. Moreover, our analysis suggest that there is no positive association between the income reported by US MNCs and being under an active BIT. But we do find a positive correlation between BITs and investment risk indices, a coarse proxy of the variance of the return in line with

[5]See Guinsburg 2007, pp. 117. An alternative explanation, which our model does not speak to, is one based on signaling. It is not at all apparent what signing BITs is really signaling. If trustworthy, is there a need to sign? Can we think about the existence of pooling equilibria?

[6]The proliferation of BITs has resulted a network that is small and dense which is rapidly approaching its saturation level. Since the late 1990s, for instance, the number of countries (nodes) joining the network and the number of treaties (arcs) signed has decreased. This should not be a surprise: 178 countries have signed at least one BIT by 2005 (out of roughly 200 sovereign units in the world). See Bonomo et al. 2010, pp. 3662; 3665-6.

the expectations of the effects of the provisions of the bilateral investment regime.

Yet the evidence from the econometric exercise is only an indirect test of the main prediction derived from our model that the effect of BITs should be reflected in risk levels in host countries. In order to test this predictions more directly we develop an empirical strategy aimed at estimating the risk of foreign direct investment with and without BITs for different groups of countries. We start from the assumptions of our model that the decision of foreign investors on where to operate is analogous to a portfolio allocation decision. We use this data to compute a least square estimator of the first two moments of the distribution of returns, taking into account whether the country of origin signed a BIT with the receiving country, and the development level of the latter.[7] In future work we will use parameters from this structural model to simulate the pattern of the proliferation of BITs in recent years.

The corollary from our exercise that is that formalizing the properties of Bilateral Investment treaties allows for a better understanding of the motivations to sign them and their expected consequences. The contradictory and inconclusive results on the effects of BITs on investment reported in the empirical literature are consistent with a model where BITs are consequential. The relevant empirical implication of the formation of the BITs network is a convergence in the level of risk and return in countries that participate in the network, which requires moving beyond the analysis of investment stocks and flows.

2 Summary of Empirical Literature on BITs

Empirical analyses aimed at identifying the correlates and determinants of BIT signing present contradictory conclusions: while some scholars have found that BITs have a a sizable and significant impact on direct investment inflows, others suggest that there is negligible, or no effect at all.

There are a number of studies that report a positive effect of BITs on FDI flows, particularly for BITs between one developed and one developing country (Salacuse and Sullivan 2009; Buthe and Milner 2009; Neumayer and Spess 2009). Rose-Ackerman, on the other hand, looks at the

[7] In the current version of the paper we present an informal discussion of the strategy. Due to data constraints we were unable to implement it at this stage. We will implement the estimation of the structural model in the next revision of the paper.

effect of the global coverage of BITs on investment flows to developing countries: she finds that the relationship is not linear, with FDI inflows increasing at a decreasing marginal rate (Tobin & Rose-Ackerman 2006; Rose-Ackerman 2009). Egger and Pfafermayer (2004, 2009) find that the positive effect on outward FDI stocks from OECD countries of signing a BIT becomes stronger after the agreement is ratified.

The results seem to vary widely with the sample chosen for the analysis: while an earlier study by UNCTAD (1998) reports that the number of ratified BITs do not lead to higher inflows, Hallward-Driemeyer (2003; 2009) finds no significant effects when using data on outflows from 20 OECD countries to 31 developing countries. Yackee (2009) and Tobin & Rose-Ackerman (2005) also find little evidence of an effect of BITs on flows. Swenson (2009) and Aisbett (2009) raise endogeneity and selection concerns. Swenson, for instance, argues that BITs are defensive in nature; they help foreign affiliates already operating in the host. Hence BITs should correlate positively with prior investment activity; controlling for this he finds a positive association between BITs and investment.

There is also a large controversy on whether BITs complement the effect of a favorable regulatory environment or act as substitutes for low quality institutions. The findings in the literature are also mixed: Rose-Ackerman (2009) and Hallward-Driemeyer (2003) report findings where BITs seem to reinforce the effect of domestic institutions, while Neumayer and Spess suggest that investment agreements substitute for the existence of weak enforcement and low quality institutional practices.

In the end, it is plausible that the contradictory findings are a function of the sample (country, sector and temporal coverage), operationalization and transformation of variables (flows, stocks; dyadic or aggregate), and modeling choices. Yet it is also plausible that the studies are looking at the wrong functional relationship between BITs and the allocation of FDI that would follow from their argument. All studies explicitly or implicitly assume that BITs either reinforce the domestic regulatory environment in favor of foreign investors, or signal that the country is open to foreign business.[8] Yet none of the studies tests the predictions directly and look at FDI flows (or stocks) instead. While the modeling choice is sensible given data constraints, the threat of omitted confounders looms large. In the ensuing sections we present a formalization of the argument based

[8]Buthe and Milner (2009) argue that BITs are a commitment device that locks in the favorable regime offered to investors.

on those assumptions that allows us to derive predictions on how signing BITs affects risk and return. The exercise would also allow us to better derive the expected effect of BITs on the allocation of FDI which could help reconcile the contradictory results in the empirical literature, and point to alternative avenues for estimating the effects of BITs on FDI and the activity of MNCs.

3 Modeling BITs

We model the interaction of governments as a network formation process where nodes (countries) choose which arcs to add (treaties to sign). Following the extant theoretical and empirical literature on FDI our model assumes that investors prefer higher rates of return, and that investing abroad involves higher costs and higher risks than investing at home. Hence investors' decisions on how to allocate their investments should be the outcome of a mean-variance optimization problem. Governments, in turn, internalize the utility of investors, workers and the expected spillover effects from inward investment. Governments are in competition for a fixed supply of domestic and foreign investment.[9] We model the main provisions of BITs as an enforcement technology that reduces costs and risk of investing in a host country. In anarchy arbitration is not a perfect enforcement mechanism; it constrains host government by creating reputation effects, hence increasing the costs of opportunistic behavior. These assumptions should be uncontroversial since are explicitly or implicitly present in the research on this subject.

We start with the description of a model intended to capture how countries allocate their investment abroad, continue with a presentation of the estimation technique to fit the parameters resulting from actual FDI figures, and conclude with an overview of the network formation game that makes use of the above.

[9]Theoretical and empirical models of competition explicitly or implicitly make this assumption. See Elkins et al. 2006; Guzman 2009.

3.1 A Portfolio Optimization Model

First, we discuss the second stage game that determines how countries invest assuming that some BITs are already signed among them.[10]

Countries attract capital by offering investment opportunities to investors from other countries. As with most investments, returns are not guaranteed. They can be represented by random variables whose statistics depend on the characteristics of the host country and its relationship with the investor, including whether they had signed a BIT or not.[11] We base our model in the hypothesis that a country seeks to invest its total capital destined to FDIs distributing it among other countries using a portfolio optimization approach.[12]

Under this hypothesis, a country forms beliefs about the distribution of returns when investing in each other country, and optimizes the mean-variance of the return of the portfolio. The portfolio allocation problem can be solved numerically easily because it can be formulated as a quadratic optimization problem with linear constraints. To build the model we assume that countries have an underlying return that depends on the country's development level. Indeed, we let μ_d and μ_g be the expected returns corresponding to whether the country is developed (d) or developing (g), respectively, and we let σ_d^2 and σ_g^2 be the corresponding variances. Furthermore, we postulate that signing a BIT affects these parameters by adding a possibly negative shock on the variance and a possible positive shock on the return. We denote these shocks by Δ_d^μ, Δ_g^μ, $\Delta_d^{\sigma^2}$, and $\Delta_g^{\sigma^2}$. Putting all together, a country i that invests in a country j with development level $a \in \{d, g\}$ faces

[10] Later on, we will present a simulation model that uses the framework of this section to study how BITs are signed.

[11] As an example, we can represent the investment return by a random variable given by

$$R_i = \begin{cases} X_i & \text{with probability } 1 - p_i \\ -1 & \text{with probability } p_i \end{cases}$$

where X_i is the random return if things go as planned when investing in country i, and p_i is the political risk that represents a risk of expropriation in which case all the investment is lost. Here, p_i will vary depending on whether the investor and country i have a BIT in effect because of the clauses of the treaty. After some algebra $E(R_i) = E(X_i) - p_i(E(X_i) + 1)$ and $V(R_i) = (1 - p_i)(V(X_i) + p_i(E(X_i) + 1)^2)$.

[12] In practice, investors may be companies and institutions in the country and not the country itself. Nevertheless, heterogeneity among investors makes the outcome of this approach similar to the situation if we had considered the individual investors.

stochastic returns whose first two moments are respectively

$$\mu_a + BIT_{ij}\Delta_a^{\mu} \qquad \text{and} \qquad \sigma_a^2 + BIT_{ij}\Delta_a^{\sigma^2},$$

where BIT_{ij} is a dummy variable that represents whether the two countries have signed a BIT that is in effect.[13]

For simplicity of notation, we encode all the statistics of returns in vectors. The resulting expectations from the point of view of country i are denoted by $\vec{\mu}_i$, and the variances by $\vec{\sigma}_i^2$. The country has to decide what proportion w_{ij} of its capital destined to foreign investment is going to be allocated to country j. We refer to the full vector of allocations for country i as w_i.

In summary, denoting the risk-aversion parameter by $q \geq 0$ (which for now we assume homogeneous across countries), country i has to solve the following optimization problem:

$$\text{maximize } \vec{\mu}_i^T w_i - \tfrac{1}{2}\, q w_i^T \Sigma w_i \tag{1}$$

$$\text{subject to } \mathbb{I}^T w_i = 1, \tag{2}$$

$$0 \leq w_i \leq \mathbb{I}. \tag{3}$$

Here, Σ is the square covariance matrix and $\mathbb{I}$ is the vector of all ones. We make the assumption that returns are independent for different countries, which makes Σ to be zero off the diagonal and equal to $\vec{\sigma}_i^2$ along it.[14] Since we do not have data for the amount that a country invests in itself, we decided against including that decision in our model.[15]

[13] For tractability reasons, we created the portfolio optimization model in such a way that investment decisions of one country do generate externalities on other countries. The externalities of signing BITs are captured by the shocks to the expectations and standard deviations of returns. This simplification allows us to directly optimize Problem (**??**)-(**??**), instead of having had to consider a game to forecast the investment decisions.

[14] This assumption is not central to the model, but simplifies the estimation because we need to estimate a constant number of parameters instead of a number that depends on the number of countries. Nevertheless, more complicated models with a constant number of parameters that allow for correlation among returns are also possible.

[15] Adding domestic investment would have allowed us to incorporate benefits to the host country arising from employment, technological spillovers, tax receipts and other social gains when foreign capital is invested in the country. The model, though, would not have changed structurally.

3.2 A Simulation Model for BIT Signatures

Using various parameters, which can be estimated as discussed in Section **??**, a country i that is considering signing a BIT with country j can forecast the economic benefit of signing the treaty. Because at a first stage we do not model the costs that countries incur when signing BITs, if the shocks to the expectation and standard deviation turn out to be positive and negative respectively, it is always beneficial to sign a BIT; otherwise, it is never beneficial.

Using this framework, we simulate the *network formation game* where countries are represented by nodes, and BITs by arcs in the network. It is expected that the equilibrium of this game is that all BITs are signed between each dyad of countries; the interesting aspect to study are the transient states leading to equilibrium and compare them to actual BIT data that we have collected.

The modeling decision we need to make is how to select candidates to sign BITs. For a country chosen at random, one could randomize among those counterpart countries that offer largest welfare gains if they were to sign a treaty. Since this process is simulated and, hence, has random elements, we cannot expect the network to look exactly like the one we observe in reality. Instead, we can look at structural properties of the network and validate that they match. Some examples are clustering coefficient, diameter, and density (Bonomo et al. 2010).[16]

An central observation from this modeling strategy is that even if BITs are consequential, i.e., if they affect the mean or the variance to the return to investment, we would still expect that the effect of signing a BIT on the allocation of investment across countries will dissipate over time. This dissipation occurs because as more countries sign more BITs the change they impose to (**??**), whichever it is, is made uniform across all countries in the portfolio.[17] This is a key insight that we explore empirically in section **??**.

[16] Bonomo et al. show that a random network growth model of BIT signing offers an excellent fit with the observed evolution of the network. They propose a generalized preferential attachment growth model for the BIT network, where countries are divided into two groups (developed and developing). At an early stage the likelihood of signing a BIT with a country is a function of the difference in the level of development (where developed countries sign agreements with developing countries) and proportional to the number of BITs signed by that country in prior years. At a later stage preferential attachment is relaxed and countries are allowed to randomly choose their counterparts. This simple model of network growth accurately reproduces the evolution of the BIT network (Bonomo et al. 2010, 3666-71).

[17] Actually, the effect does not disappear completely because the variance term is quadratic and hence does not sum up to a constant. In addition, there is heterogeneity between the developed and developing countries.

4 Empirics

It is plausible that signing BITs preserves the allocation of investment, or that given the signatory parties' characteristic signing is defensive, as proposed by Swenson (2009). That does not mean that BITs have no effect; on the contrary the proliferation of BITs would reduce risk. But risk cannot be observed directly. In the ensuing sections we present an empirical strategy that aims at capturing the interaction between governments and investors in the BIT network formation game. We analyze whether the effect of the allocation of investment as a function of BITs decays over time, as would be predicted from the model.

In Section **??** we showed that under our model of network formation based on standard portfolio allocation conditions all dyads would have an incentive to sign those bilateral agreements that would result in increased returns and reduced risk to investors. This would result in lower risk levels in all countries participating in the network, and under most circumstances no change in the allocation of the portfolio of investment. The model assumes that there are no costs or delays to signing agreements. Yet we know that there are costs to signing agreements, diplomatic and political, and usually delays in their implementation. As a result international agreements are usually signed and ratified sequentially. Hence, a host country could see its risk fall when signing and implementing a BIT with an investment exporting country. This results in a competitive edge over other potential hosts which leads to a reallocation of investment in its favor. As those competitors sign and implement investment agreements with the home government reducing their own risk levels, the competitive edge enjoyed by the first government would dissipate. Moreover, the increase in investment activity in the host could lead to higher competition and hence lower net benefits, further reducing the positive effect of BITs over time. In this section we move to test this hypothesis. If this conjecture is right, we would be able to reconcile the contradictory findings in the empirical on the effects of BITs on investment flows.

In order to estimate this hypothesis we collected data of US outward direct investment for the period 1970-2006. Bilateral direct investment data sources for most countries and year are unreliable and notoriously spotty. Additionally, estimating the effect of BITs on panels consisting of directed dyads over time is plagued with technical problems, since the data is usually clustered within

dyads, within source and host countries and within years. We chose to estimate the relationship for a unique source country, the US. Limiting our analysis to US outward investment has several advantages: first, we are able to validate the data reported by UNCTAD and OECD with the more reliable data on MNC activity maintained by the BEA.[18] Additionally, looking at a unique source country eliminates one layer of heterogeneity in the data (including differences in reporting standards), allowing us to better model the error structure by clustering on the host.[19] Tables **??** and **??** present the list of BITs and PTAs, respectively, signed by the US.

[Tables **??** and **??** about here]

The dependent variable in this model is the natural log of the difference in outward FDI stocks reported by US MNCs. Given our assumption that the allocation of investment around the world is analogous to allocating a portolio of capital we chose to investment from a unique source country rather than flows (from individual or multiple countries) or ratios, the alternative operationalization of the dependent variable in the empirical literature on the effects of BITs. We adopted a logarithmic transformation to adjust for the skewed distribution of the FDI.Our empirical strategy is based on the estimation of the following model:

$$\ln(FDI)_{i,t} \;=\; \beta_0 + \beta_1 \ln(FDI)_{i,t-1} + \beta_2 BIT_{ij} + X_i\xi + \sigma_t + \alpha_i + \varepsilon_{it}\,, \tag{4}$$

where ξ is a vector of regression coefficients, X_i is a vector of k control variables, BIT_{it} is an indicator variable for country/years when a BIT with the US is in effect.[20] Some countries do not need BITs to guarantee investment risk; α_i is a unit specific disturbance aimed at capturing these country specific characteristics. More secure investment and better conditions could lead to more foreign investment over time, which is captured by time controls.[21]

The results of the estimation are presented in Table **??**. The controls run in the expected

[18]We thank Srividya Jandhyala, Vit Henisz and Ed Mansfield for sharing the UNCTAD-OECD bilateral FDI data. We also thank Clint Peinhardt and Todd Allee for sharing their BIT data.

[19]On the technical issues arising in classical econometric models in the presence of errors clustered by units, dyads and time see Erikson et al. 2010, 2014.

[20]While entering into a BIT could have legally binding effects on the signatory parties under international law, these effects tend to be limited particularly in countries that require a legislative approval process of international agreements. It is only after ratification that the main provisions of investor protection and arbitration would become effective.

[21]Errors are clustered on countries. Alternatively we estimate a random effects models.

direction: countries that are more open to trade, larger, and more developed tend to receive more US FDI. US MNC activity is greater in countries that are contiguous to the US (Mexico and Canada) and speak English.[22]

The second and third columns contain estimates of the effect of years under a ratified BIT. The coefficient on ratified BIT suggests that the effect is sizable and significant. Yet adding year controls, in the reported case decade dummies, reduces the effect in substantive and statistical significance. Time seems to be doing most of the action: US (and world) outward FDI has increased dramatically since the 1980s; this coincides with the start of the US BIT signing activity. Moreover, UNCTAD reports that more countries have adopted pro-investor regulatory policies in the same period, raising concerns of spurious correlation. Indeed, looking at the world as a whole, Figure **??** shows a peak in the number of signatures of new BITs in the late 1990s and the whole curve resembles closely that of average FDI activity in the world. This pattern is apparent in Figures **??** and **??** that plots the US outward FDI stock to countries in the Upper-middle and Lower-middle income groups, and the cumulative number of BITs signed.[23] It is not clear which is a consequence of each other or whether the two are a consequence of yet another variable, as for example economic activity in the world, that could affect both of these variables.

Figure **??** about here

Adding temporal dummies reduces the size and significance level of BITs on outward US investment. These results are similar to those reported in the literature. Note, however, that the coefficient captures the average estimated effect for all country/years under a ratified BITs. It is plausible that the effect dissipates once other actors internalize the incentives created by the signing and ratification of the BIT by a dyad. In order to estimate these temporal effects we fit additional models identifying four-, five- and ten-year intervals since the BIT is in effect.[24] The results suggest

[22]Note that in the random effects models, and in OLS models with errors corrected for panel effects, distance enters with a positive sign and never reaches conventional significance level. We are able to retrieve a negative and significant coefficient on distance, as would be expected in the gravity setup, when other controls are removed from the model. Contiguity and language remain significant after controlling for PTAs.

[23]The US has signed most BITs with countries in these two income groups. Similar patterns are observe for the other two income groups as classified by the World Bank: High and Low.

[24]Using a year count interacted with the year under a ratified BIT we obtain the following results: year enters positively, which captures the increase in FDI since the mid-1980s. The coefficient on the ratified BIT dummy is

that the effect of BIT ratification on US investment flows is stronger in the intervals closest to the agreement's entry in effect, and the effect dissipates over time.[25]

[Table ?? about here]

In sum, the evidence from the statistical analysis suggests that the effect of BITs is not stable, as would be predicted by the portfolio allocation model of the network formation game introduced in Section ??. Yet given the properties of the investment regimes we would need to explore the effect BITs on the return to investment or the risk faced by investors, two outcomes that are very difficult to observe when dealing with investment under control. We could explore the first effect by regressing a coarse proxy of return -namely the income reported by the affiliates of US MNCs over the stock invested in that country- on the existence of a BIT in the country of the affiliate, and other controls.[26] We also test whether being under a ratified BIT has any effect on risk, by regressing an index of investment risk, on a dummy variable that measures the existence of a ratified BIT.[27]

[Tables ?? and ?? about here]

Tables ?? and ?? reproduce the results from this exercise. The tables show that there is no positive association between country-years under BITs and the return to investment.[28] Yet the

positive and significant, and the interaction term between BIT and time enters the regression negatively, in line with the findings reported in table ??. These models are available from the authors upon request.

[25]In additional models we analyze the effect of PTAs signed by the US which include investment protection chapters similar to those in the US model BIT. Being under a PTA has a positive effect on US investment under some specifications but not others; yet the addition of these variables to the econometric models does not affect the estimated effect of a ratified BIT in substantive or statistical terms. The US has signed preferential trade agreements with the following countries: Canada and Mexico (NAFTA, in effect since 1994); Costa Rica, Guatemala, Honduras, El Salvador, Nicaragua and the Dominican Republic (CAFTA-DR, signed in 2004, with effective dates that vary for each party depending on their ratification); Peru (2006, in effect since 2009); Chile (2003, ratified in 2004); Morocco (signed in 2004, ratified in 2006); Oman (signed in 2006; ratified in 2009); Singapore (signed in 2003; ratified in 2004); and Australia (signed in 2004; ratified in 2005). The following PTAs have not entered into effect as on August 2010: Colombia (signed in 2006); Panama (signed in 2007); and South Korea (signed in 2007). The US has also entered into PTAs with no investment protection with three Middle Eastern countries: Jordan (signed in 2000, in effect since 2001); Israel (signed in 1985 and ratified in 1995); and Bahrain (signed in 2004 and ratified in 2006; contains protection provisions for financial invest only). See Table ??

[26]The income data is from the Bureau of Economic Analysis, *U.S. Direct Investment Abroad, Direct Investment Income Without Current-Cost Adjustment*. Income is presented net of U.S. and foreign withholding taxes.

[27]The risk index is the investment component of the International Country Risk Guide. Its subcomponents include: i) Contract Viability/Expropriation; ii) Profits Repatriation; and iii) Payment Delays. Higher values are associate with lower risk.

[28]Note, however, that the income reported active affiliates of US MNCs is far from the best proxy of the underlying return concept on which our model is based. Moreover, there is an built-in selection bias since the reported income is only for affiliates which are already conducting business in the host country. The pattern of missing values in the BEA income data is not random given the suppression of data to avoid disclosure of individual companies.

results reproduced in Table **??** do suggest that ratified BITs are positive and statistically significant associate with a more favorable investment environment in host countries. The within unit fixed effect specification suggests that countries that sign and ratify a BIT with the US have lower investment risk. But just like the association between BITs and flows, we find the the relationship is stronger in the first decade after the BIT has been ratified and is in effect. Altogether the results suggest that BITs have a temporary effect on the allocation of investment, and that the effect is likely to be driven by a reduction in the risk environment faced by investors in the host, but not on the expected returns in those countries. It should be noted, however, that the aggregate measure of risk does not exactly match the concept on which our model is built which should be bilateral, and hence harder to observe. In the next section we present an empirical strategy aimed to estimating directly the effect of BITs on risk that would be predicted from the model. The structural estimation allows us to retrieve the underlying variance on the return to investment from the observed pattern of allocation of the home country investment portfolio once we fixed the expected return to that investment.

4.1 Parameter Estimation using the Portfolio Model

In the portfolio model of Section **??**, we do not explicitly model the process by which countries acquire their beliefs on the statistics of returns to investments from other home countries in other home countries, recognizing that they are extremely hard to obtain. Instead, we will make use of the FDI data to develop a structural estimation model that can be used to find estimates for the expectation and variance of returns. To achieve that goal, we collected a database of bilateral FDI for all countries available in the period 1970-2006 and all the existing BITs with the dates when they were signed and ratified. This database includes the stock of capital that a country i has invested in each other country. Using that data, we computed vectors w_i^t that measure investments as a fraction of the total capital for country i in year t.

Since we have assumed that countries allocate money using the portfolio approach described in Section **??**, we can use the observed data to construct an estimator for the statistics of returns between countries. To do so, we compare the observed fractions to the fractions derived from

Problem (**??**)-(**??**). Referring to an optimal solution to that problem by

$$w(BITs^t, \mu_d, \mu_g, \sigma_d^2, \sigma_g^2, \Delta_d^\mu, \Delta_g^\mu, \Delta_d^{\sigma^2}, \Delta_g^{\sigma^2}, q),$$

we can fit the parameters by minimizing the sum of the squares of the Euclidean distance between the observed and predicted vectors:[29]

$$\sum_{i,t} ||w_i^t - w(BITs^t, \mu_d, \mu_g, \sigma_d^2, \sigma_g^2, \Delta_d^\mu, \Delta_g^\mu, \Delta_d^{\sigma^2}, \Delta_g^{\sigma^2}, q)||_2^2 .$$

Notice that this goodness-of-fit function cannot detect the value of q from the various values corresponding to variances because both are multiplied together for all countries. Nevertheless, since all variances are multiplied by the same constant, our estimates are enough to draw conclusions on the relative changes between the different variances in the presence or absence of BITs.

To develop a test for the estimators we proposed, we perform Monte Carlo simulation to generate random data and evaluate their statistical properties. We consider an incumbent country and for a set of countries and a range of years, we randomly sign BITs between the incumbent and the other countries. Furthermore, we also assign those countries to the developed or developing world. With that structure of a world, we set the 'real' expectation and variance of returns to be

$$E(R_i^y) = \beta_0^e + \beta_{\text{BIT}}^e \text{BIT}_i^y + \beta_{\text{DEV}}^e \text{DEV}_i,$$

and

$$V(R_i^y) = \beta_0^v + \beta_{\text{BIT}}^v \text{BIT}_i^y + \beta_{\text{DEV}}^v \text{DEV}_i,$$

where R_i^y is the return of the incumbent country investing in country i in year y, BIT_i^y is the indicator variable that country i signed a BIT at that time and DEV_i represents if the country is developed.

[29]This is a modeling decision, we could have done the same with the FDI values instead of the corresponding fractions. In that case, the model would have given more weight to countries with more capital and dyads with larger investment.

Our approach consists in setting values for the betas, generating data consistent with those values, constructing estimates for the betas, and finally comparing the estimates to the 'real' values chosen first. To generate the sample, we take the expectation and variance of returns for each year, perturb them by adding Gaussian errors with a fixed variance, and find the optimal investments of the incumbent in the other countries for each year using the portfolio optimization approach described previously. This process gives us a sample of portfolios $(p_i^y)_{i,y}$ where $\sum_i p_i^y = 1$ that represent the 'observed' FDIs invested by the incumbent country in each of the other countries.

For each sample, we use the perturbed expectation and the observed portfolio to compute the values of $\hat{\beta}_0^v$, $\hat{\beta}_{\text{BIT}}^v$, and $\hat{\beta}_{\text{DEV}}^v$ using least squares. For instance, for each possible triplet of betas, we compute the corresponding portfolio allocation and evaluate the distance to the observed portfolio. Minimizing that objective function provides us with the estimators. We repeat this process for each of the generated samples to understand the statistics of the estimators. We ran simulations for various random experiments (different configurations of the world and different 'real' values for the betas) and found that the empirical expectations of the estimators agree with the values from where we started (see figure **??**). All the empirical distributions seem reasonably normal, although some of them are slightly skewed.[30]

The previous simulations give us some confidence that if present in the data we should be able to retrieve the underlying risk level faced by US investors when a BIT is present and when it is not. Thus, in order to estimate whether the effect of BITs on risk runs in the direction expected by our model we fit the least squares estimator to the data: we have information on the observed portfolio allocation each year, the observed return (proxied by income), the level of development of the host country, and the presence of a ratified BIT in that country.

5 Conclusion

In this paper we develop a network formation game aimed at explaining the signing of BITs. The model incorporates the key insights from the theoretical and empirical literature on the proliferation

[30] We are still investigating the reasons of this. A possibility is that it has to do with the fact that variances can never be smaller than zero.

of international investment agreements. In particular we assume that investors' decisions to be active abroad are driven by the expectation of receiving greater returns. Given the nature of FDI, the decision is also affected by risk levels in host countries. We explicitly model the main provisions of BITs as an enforcement technology that reduces (but does not eliminate) risk (the variance to investors' return), and has the potential to increase the expected return from doing business abroad. The interaction between governments is modeled as a network formation process where nodes (countries) choose which arcs to add (treaties to sign). In deciding which treaties to sign, governments also internalize the potential effects of inward investment on the return to domestic factors of production.

This setup allows us to derive a central corollary that helps explain the contradictory findings in the empirical literature on effect of BITs on investment flows (and even stocks). Signing and ratifying BITs is likely to increase the mean and reduce the variance of the return to investors from the counterpart in the agreement. It does not necessarily follow that the growth would result in a sharp and permanent reallocation of investment in the world. In equilibrium -when all the potentially beneficial agreements have been signed and the network reaches a level of saturation- the signing and ratification of BITs would be consistent with hardly any reallocation of investment capital across countries, particularly if BIT signing is defensive as proposed by a body of the literature. We would, however, expect some transitional changes in the allocation of capital in favor of countries that are BIT signatories in the transition to that stage, a prediction that seems to be borne out in statistical analyses of US outward FDI flows. We do expect BITs to have an effect on risk and return to foreign investors, which are hard to observe. Hence we develop an empirical strategy to estimate the effect of BITs on investment risk from a structural model of FDI allocation.

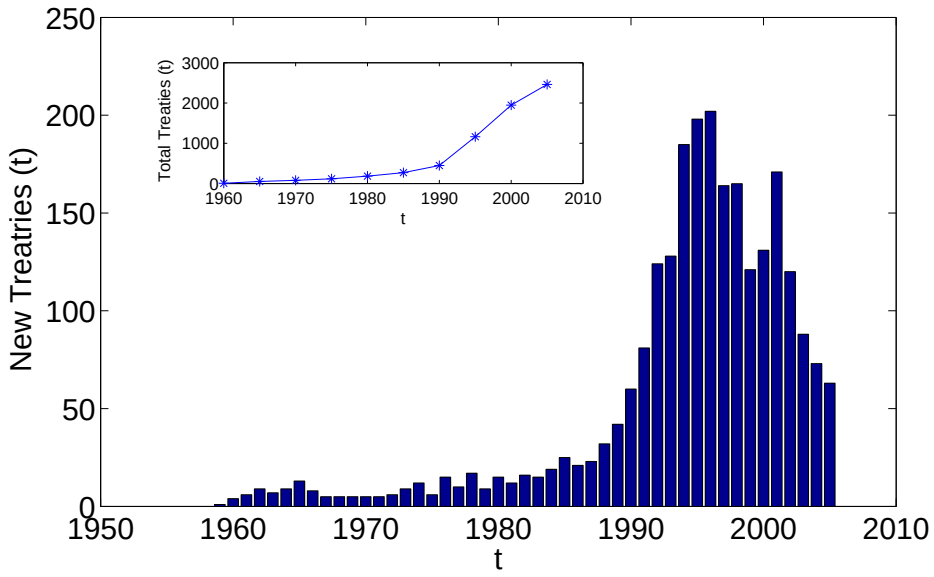

Figure 1: New treaties per year. The insets show cumulative numbers. Source: Bonomo et al. 2010.

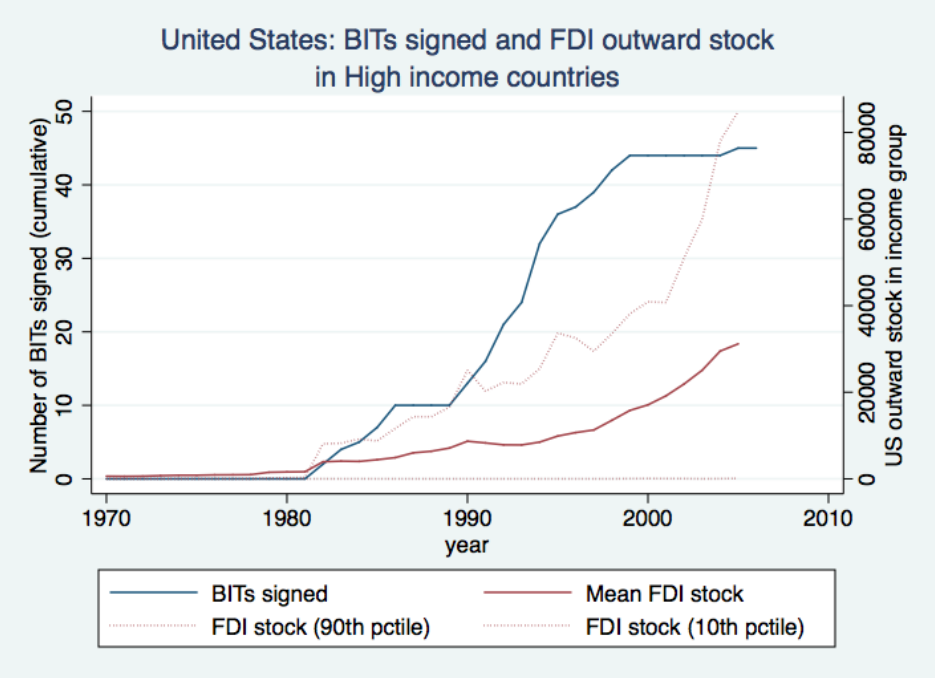

Figure 2: United States: Total BITs and FDI outward stock into High income countries

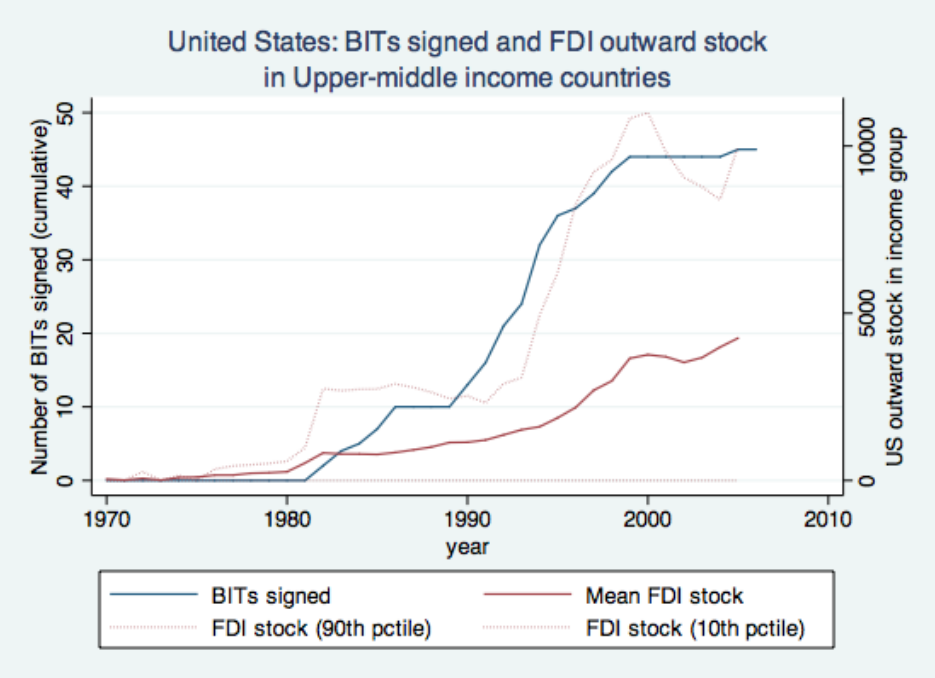

Figure 3: United States: Total BITs signed and mean FDI outward stock into Upper-middle income countries

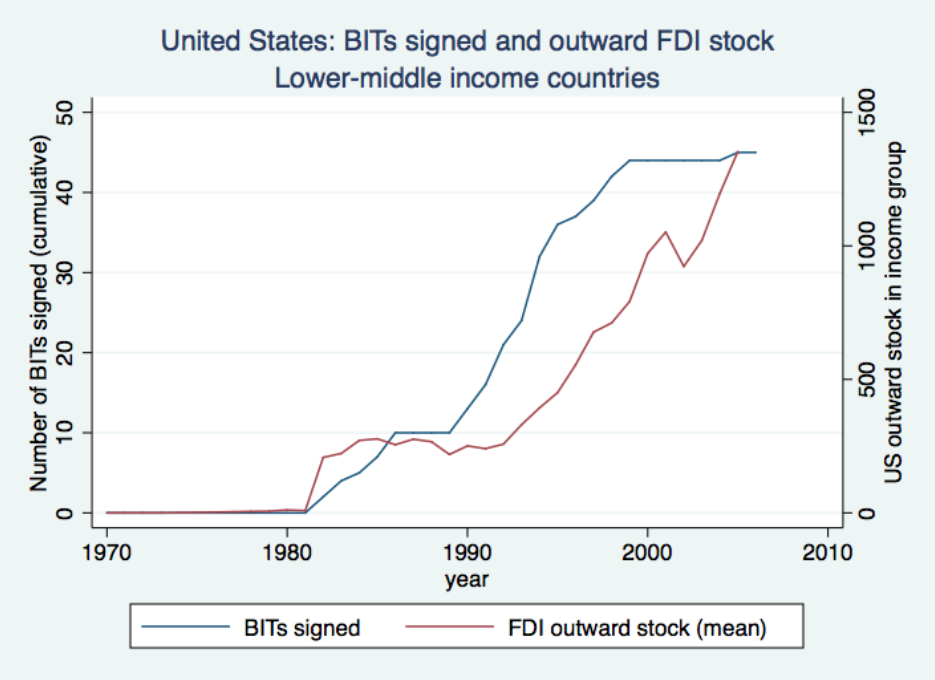

Figure 4: United States: Total BITs signed and mean FDI outward stock into Lower-middle income countries

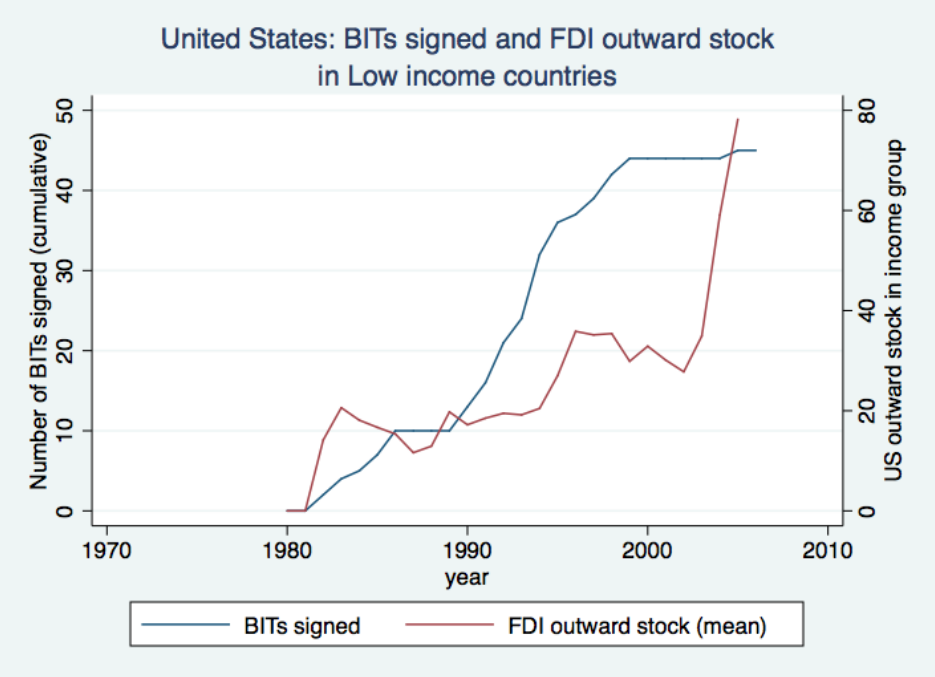

Figure 5: United States: Total BITs and FDI outward stock into Low income countries

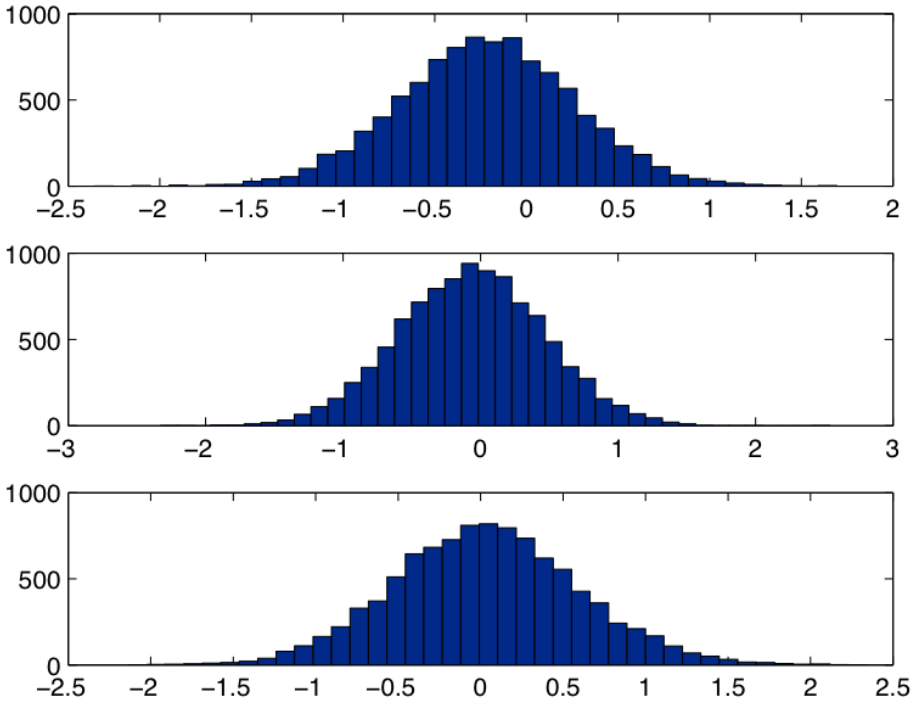

Figure 6: Distribution of errors of simulated parameters from Monte Carlo experiment

True	Expect	St. dev
+15.00	+14.783	+0.477
-3.00	-3.067	+0.528
+2.00	+2.034	+0.564

n=8, t=21, sample=10,000

Eucl. dist.=0.229496

Table 1: BITs signed by the US

Country	Sign Date	Entry Date
Panama	Oct-1982	May-1991
Senegal	Dec-1983	Oct-1990
Haiti	Dec-1983	..
Congo Dem	Aug-1984	Jul-1989
Morocco	Jul-1985	May-1991
Turkey	Dec-1985	May-1990
Cameroon	Feb-1986	Apr-1989
Bangladesh	Mar-1986	Jul-1989
Egypt	Mar-1986	Jun-1992
Grenada	May-1986	Mar-1989
Congo	Feb-1990	Aug-1994
Poland	Mar-1990	Aug-1994
Tunisia	May-1990	Feb-1993
Sri Lanka	Sep-1991	May-1993
Czech Republic	Oct-1991	Dec-1992
Slovakia	Oct-1991	Dec-1992
Argentina	Nov-1991	Oct-1994
Kazakhstan	May-1992	Jan-1994
Romania	May-1992	Jan-1994
Russian Federation	Jun-1992	..
Bulgaria	Sep-1992	Jun-1994
Armenia	Sep-1992	Mar-1996
Kyrgyzstan	Jan-1993	Jan-1994
Moldova	Apr-1993	Nov-1994
Ecuador	Aug-1993	May-1997
Belarus	Jan-1994	..
Jamaica	Feb-1994	Mar-1997
Ukraine	Mar-1994	Nov-1996
Georgia	Mar-1994	Aug-1997
Estonia	Apr-1994	Feb-1997
Trinidad & Tobago	Sep-1994	Dec-1996
Mongolia	Oct-1994	Jan-1997
Uzbekistan	Dec-1994	..
Latvia	Jan-1995	Dec-1996
Albania	Jan-1995	Jan-1998
Honduras	Jul-1995	Jul-2001
Nicaragua	Jul-1995	..
Croatia	Jul-1996	Jun-2001
Jordan	Jul-1997	Jun-2003
Azerbaijan	Aug-1997	Aug-2001
Lithuania	Jan-1998	Nov-2001
Bolivia	Apr-1998	Jun-2001
Mozambique	Dec-1998	Mar-2005
El Salvador	Mar-1999	..
Bahrain	Sep-1999	May-2001
Uruguay	Nov-2005	Nov-2006
Rwanda	Feb-2008	Jan-2002

Table 2: PTAs signed by the US

Partner country	Sign date	Entry date	Type of PTA	Investment protection
Israel	Apr-1985	Jan-1995	Bilateral	No
Canada	Dec-1993	Jan-1994	NAFTA	Yes
Mexico	Dec-1993	Jan-1994	NAFTA	Yes
Jordan	Oct-2000	Dec-2001	Bilateral	No
Singapore	May-2003	Jan-2004	Bilateral	Yes
Chile	Jun-2003	Jan-2004	Bilateral	Yes
Australia	May-2004	Jan-2005	Bilateral	Yes
El Salvador	May-2004	Mar-2006	CAFTA-DR	Yes
Honduras	May-2004	Apr-2006	CAFTA-DR	Yes
Nicaragua	May-2004	Apr-2006	CAFTA-DR	Yes
Guatemala	May-2004	Jul-2006	CAFTA-DR	Yes
Dominican Republic	May-2004	Mar-2007	CAFTA-DR	Yes
Costa Rica	May-2004	Jan-2009	CAFTA-DR	Yes
Morocco	Jun-2004	Jan-2006	Bilateral	Yes
Bahrain	Sep-2004	Aug-2006	Bilateral	Yes[†]
Oman	Jan-2006	Jan-2009	Bilateral	Yes
Peru	Apr-2006	Feb-2009	Bilateral	Yes
Colombia	Nov-2006	May-2012	Bilateral	Yes
Panama	Jun-2007	Oct-2012	Bilateral	Yes
South Korea	Jun-2007	Mar-2012	Bilateral	Yes

[†] Protection for financial investment only

Table 3: Effect of ratified BITs on US outward investment

	Dependent Variable						
Variable	Ln (US FDI outflows)						
Ln(FDI)$_{t-1}$	0.746***	0.542***	0.627***	0.541***	0.628***	0.541***	0.628***
	(0.021)	(0.025)	(0.023)	(0.026)	(0.023)	(0.025)	(0.023)
Interval under ratified BIT							
All years	1.06***	0.454*					
	(0.213)	(0.241)					
1st interval			0.22	0.242	0.299	0.307	0.397**
			(0.256)	(0.314)	(0.257)	(0.308)	(0.188)
2nd interval			0.685**	0.838***	0.479*	0.619*	0.046
			(0.282)	(0.318)	(0.274)	(0.316)	(0.316)
3rd interval			0.017	0.377	0.371*	0.584**	
			(0.360)	(0.307)	(0.220)	(0.272)	
4th interval			0.377	1.008*	-0.266	0.058	
			(0.738)	(0.530)	(0.790)	(0.671)	
5th interval					0.245	0.806	
					(1.039)	(0.828)	
Ln(GDP/cap)		0.646**	0.464***	0.646**	0.465***	0.648**	0.464***
		(0.264)	(0.101)	(0.265)	(0.101)	(0.265)	(0.101)
Ln(openness)		0.621***	0.438***	0.617***	0.437***	0.618***	0.439***
		(0.189)	(0.093)	(0.190)	(0.093)	(0.190)	(0.093)
Ln(xrate)		-0.018	-0.014	-0.019	-0.013	-0.019	-0.013
		(0.028)	(0.012)	(0.028)	(0.012)	(0.028)	(0.012)
Ln(population)		-0.206	0.45***	-0.198	0.45***	-0.192	0.451***
		(0.469)	(0.044)	(0.472)	(0.044)	(0.472)	(0.044)
Contiguous			0.839*		0.829*		0.826*
			(0.504)		(0.502)		(0.501)
Common language			0.241*		0.24*		0.238*
			(0.129)		(0.128)		(0.128)
Ln(distance)			0.193		0.189		0.19
			(0.217)		(0.217)		(0.216)
Income group (excl: High)							
Low			-0.834***		-0.84***		-0.843***
			(0.276)		(0.276)		(0.276)
Lower-middle			-0.793***		-0.794***		-0.799***
			(0.219)		(0.219)		(0.219)
Upper-middle			-0.604***		-0.608***		-0.61***
			(0.194)		(0.194)		(0.194)
Decades (excl: 1970s)							
1980s		2.236***	1.82***	2.238***	1.818***	2.236***	1.817***
		(0.167)	(0.151)	(0.168)	(0.151)	(0.168)	(0.151)
1990s		2.903***	2.121***	2.909***	2.116***	2.906***	2.112***
		(0.290)	(0.200)	(0.291)	(0.200)	(0.291)	(0.199)
2000s		2.966***	2.076***	2.956***	2.075***	2.959***	2.08***
		(0.332)	(0.223)	(0.332)	(0.223)	(0.332)	(0.223)
Intercept	0.037	-8.231*	-11.953***	-8.287*	-11.931***	-8.349*	-11.928***
	(0.049)	(4.644)	(1.897)	(4.658)	(1.896)	(4.657)	(1.895)
N	3658	3499	3499	3499	3499	3499	3499
Groups	188	178	178	178	178	178	178
R^2	0.702	0.649	0.752	0.652	0.752	0.653	0.752
Intercepts	FE	FE	Random	FE	Random	FE	Random
Region dummies	No	No	Yes	No	Yes	No	Yes
Under BIT interval	All	All	5-year	5-year	4-year	4-year	10-year

Significance levels : * 10% ** 5% *** 1%; clustered std. errors in parenthesis.

Table 4: Effect of ratified BITs on Income

Variable	DV: Return = Income/FDI Position				
Return_{t-1}	-0.008	-0.007	-0.007	-0.007	-0.006
	(0.064)	(0.063)	(0.067)	(0.061)	(0.065)
Ln(FDI)_{t-1}	0.007	0.01	0.008	0.011	0.009
	(0.012)	(0.014)	(0.014)	(0.015)	(0.014)
Interval under ratified BIT					
BIT ratified	-0.109	-0.089	-0.006		
	(0.083)	(0.078)	(0.079)		
Under BIT (1st)				-0.126	-0.064
				(0.084)	(0.065)
Under BIT (2nd)				0.252	0.322
				(0.283)	(0.321)
Ln(GDP/cap)		0.114	0.099	0.115	0.098
		(0.102)	(0.062)	(0.102)	(0.063)
Ln(openness)		-0.039	-0.071	-0.046	-0.076
		(0.069)	(0.049)	(0.069)	(0.051)
Ln(xrate)		-0.004	-0.001	-0.006	-0.003
		(0.005)	(0.005)	(0.006)	(0.004)
Ln(population)		-0.015	-0.02	-0.021	-0.022
		(0.161)	(0.020)	(0.157)	(0.021)
Ln(distance)			-0.056		-0.069
			(0.092)		(0.095)
Decades (excl: 2000s)					
1980s		0.057	0.051	0.074	0.068
		(0.055)	(0.037)	(0.065)	(0.047)
1990s		0.055*	0.051**	0.085	0.081*
		(0.031)	(0.025)	(0.052)	(0.046)
Income group (excl: High)					
Low			0.101		0.107
			(0.151)		(0.155)
Lower-middle			0.078		0.073
			(0.227)		(0.230)
Upper-middle			0.04		0.037
			(0.091)		(0.093)
Intercept	0.143***	-0.641	0.117	-0.586	0.239
	(0.052)	(1.680)	(0.653)	(1.628)	(0.690)
N	1497	1485	1485	1485	1485
Groups	144	142	142	142	142
R^2	0.001	0.000	0.029	0.0029	0.046
Intercepts	FE	FE	RE	FE	RE
Region dummies	No	No	Yes	No	Yes
Under BIT interval	All	All	All	10-year	10-year

Significance levels : * 10% ** 5% *** 1%; clustered std. errors in parenthesis.

Table 5: Effect of ratified BITs on Investment Risk

Variable	DV: ΔInvestment risk			
Investment Risk$_{t-1}$	-0.131***	-0.241***	-0.242***	-0.242***
	(0.010)	(0.015)	(0.015)	(0.015)
Interval under ratified BIT				
BIT ratified	0.543***	0.263*		
	(0.107)	(0.134)		
Under BIT (1st)			0.296**	0.268*
			(0.138)	(0.153)
Under BIT (2nd)			0.021	0.342**
			(0.142)	(0.158)
Under BIT (3rd)				0.02
				(0.148)
Under BIT (4th)				0.172
				(0.166)
Ln(GDP/cap)		0.563***	0.558***	0.557***
		(0.211)	(0.211)	(0.211)
Ln(openness)		0.439***	0.446***	0.445***
		(0.114)	(0.115)	(0.115)
Ln(xrate)		0	0.002	0.001
		(0.013)	(0.013)	(0.013)
Ln(population)		0.913***	0.92***	0.92***
		(0.291)	(0.290)	(0.291)
Decades (excl: 2000s)				
1980s		-0.421***	-0.432***	-0.431***
		(0.120)	(0.120)	(0.120)
1990s		-0.339***	-0.357***	-0.355***
		(0.093)	(0.094)	(0.094)
Intercept	0.939***	-13.16***	-13.202***	-13.19***
	(0.068)	(3.540)	(3.539)	(3.539)
N	2687	2630	2630	2630
Groups	141	137	137	137
R^2	0.0254	0.0077	0.0079	0.0079
Intercepts	FE	FE	FE	FE
Under BIT interval	All	All	10-year	5-year

Significance levels : * 10% ** 5% *** 1%; clustered std. errors in parenthesis.

References

Aisbett, Emma (2009). Bilateral Investment Treaties and Foreign Direct Investment: Correlation versus Causation. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Bonomo, Flavia, Daniela Sabán, and Nicolás E. Stier-Moses (2010). Analysis and Models of Bilateral Investment Treaties using a Social Networks Approach, *Physica A*, 389, 3661-3673.

Buthe, Tim and Helen Milner (2008). "The Politics of Foreign Direct Investment into Developing Countries: Increasing FDI through International Trade Agreements?" *American Journal of Political Science* 52, no.4 (October): 741-62.

Buthe, Tim and Helen Milner (2009). Bilateral Investment Treaties and Foreign Direct Investment: A Political Analysis. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Egger, Peter and Michael Pfaffermayer (2004). "The impact of bilateral investment treaties on foreign direct investment." *Journal of Comparative Economics*, Vol. 32 (2004), 788-804.

Egger, Peter and Michael Pfaffermayer (2009). The Impact of Bilateral Investment Treaties on Foreign Direct Investment. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Elkins, Z., A. T. Guzman, and B. A. Simmons (2006). Competing for Capital: The Diffusion of Bilateral Investment Treaties, 1960-2000. *International Organization* 60 (4):811-846.

Erikson, Robert S., Pablo M. Pinto, and Kelly T. Rader (2014). "Dyadic Analysis in International Relations: A Cautionary Tale." *Political Analysis* Volume 22, Issue 4: 457–463.

Erikson, Robert S., Pablo M. Pinto, and Kelly T. Rader (2010). "Randomization Tests and Multi-Level Data in U.S. State Politics." *State Politics and Policy Quarterly*, Vol. 10, No. 2 (Summer 2010): pp. 180198.

Guzman, A. T. (1998). Explaining the Popularity of Bilateral Investment Treaties: Why LDCs Sign Treaties That Hurt Them. *Virginia Journal of International Law*, 38: 639.

Hallward-Driemeier, Mary (2009). Do Bilateral Investment Treaties Attract FDI? Only a Bit... and they could bite. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Jandhyala, Srividya, Henisz, Witold J. and Mansfield Edward (2008). "Pooling Dyads is a BIT Inappropriate: A Two Stage Model for Bilateral Investment Treaty Signing." Paper presented at the Annual Meeting of the American Political Science Association, Boston, August 28-31, 2008.

Kobrin, Stephen J. (1998). The MAI and the Clash of Globalizations. *Foreign Policy* (Autumn, 1998) 112: 97-109.

Neumayer, Eric, and Laura Spess (2005). Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries? *World Development*, 33(10): 31-49.

Neumayer, Eric, and Laura Spess (2009). Do Bilateral Investment Treaties Increase Foreign Direct Investment to Developing Countries? In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Rose-Ackerman, Susan (2009). The Global BITs Regime and the Domestic Environment for Investment. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Salacuse, Jeswald W. and Nicholas P. Sullivan (2009). Do BITs Really Wrok? An Evaluation of Bilateral Investment Treaties and their Grand Bargain. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Sachs, Lisa E. and Karl P. Sauvant (2009). BITs, DTTS, and FDI Flows: An Overview. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Swenson, Deborah (2009). Why Do Developing Countries Sign BITs? In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.

Tobin, Jennifer and Susan Rose-Ackerman (2005). "Foreign Direct Investment and the Business Environment in Developing Countries: The Impact of Bilateral Investment Treaties." *Yale Law School, Economics and Public Policy Research Paper* No. 293.

Tobin, Jennifer and Susan Rose-Ackerman (2006). "Bilateral investment treaties: Do they stimulate foreign direct investment?" Yale University, mimeo.

United Nations Conference on Trade and Development (1998). *Bilateral Investment Treaties in the Mid-1990s.* Genevea: United Nations.

United Nations Conference on Trade and Development (2003). *World Investment Report 2004 - FDI Policies for Development: National and International Perspectives.* Geneva: United Nations.

United Nations Conference on Trade and Development (2004). *World Investment Report 2004 - The Shift Towards Services.* Geneva: United Nations.

United Nations Conference on Trade and Development (2009). *The Impact on Foreign Direct Investment of BITs.* Geneva: United Nations

Yackee, Jason (2009). Do BITs Really Work? Revisiting the Empirical Link between Investment Treaties and Foreign Direct Investment. In Karl P. Sauvant and Lisa E. Sachs, editors, *The Effects of Treaties on Foreign Direct Investment. Bilateral Investment Treaties, Double Taxation Treaties, and Investment Flows.* Oxford, UK: Oxford University Press.