

## DO BILATERAL INVESTMENT TREATIES DELIVER THE GOODS? EVIDENCE FROM DEVELOPING COUNTRIES

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**Abstract:** Bilateral investment treaties (BITs), signed by developing countries explicitly state the objective of promoting foreign direct investment (FDI). The rapid increase in the number of BITs and the concurrent increase in worldwide flows of FDI between 1980 and 2003 suggests that BITs are an effective strategy toward this goal. Recent studies provide some empirical support for this link. However, FDI flows into specific countries from 1980 to 2003 reveals the puzzling behavior for flows to increase soon after country starts signing BITs, followed by fluctuations with either a downward trend or no noticeable trend at all. Our main contribution is to explain this behavior by explicitly incorporating the impact of treaty violations, as evidenced by treaty disputes arbitrated by the International Centre for Settlement of Investment Disputes, on FDI flows. We find that while BITs are effective in attracting investment, disputes tend to decrease future investment flows.

JEL Classifications: F21; F53; O24; O16

Keywords: FDI; Bilateral Investment Treaty; domestic content

### 1. INTRODUCTION

Bilateral investment treaties (BITs), signed by developing countries explicitly state the objective of promoting foreign direct investment (FDI). The rapid increase in the number of BITs and the concurrent increase in worldwide flows of FDI between 1980 and 2003 suggests that BITs are an effective strategy toward this goal. However, patterns of FDI flows into specific countries from 1980 to 2003 reveals a general tendency for flows to increase soon after country starts signing BITs, followed by fluctuations with either a downward trend or no noticeable trend at all (See Figures 2 through 5). This apparent failure to sustain the initial positive response of FDI to the signing of BITs presents a conundrum. One explanation is that foreign investors initially overestimate the expected benefits of BITs. Once the (lower) true value of the returns is realized investors might reduce or even curtail future commitments. If this were true one would expect potential investors, upon observing the experiences of their predecessors, would discount the benefits of BITs and hold back on future agreements. But the data on treaties classified by year of approval do not indicate this happened to any significant extent (see, for example, Figure 4).

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A more plausible explanation may be that the benefits of BITs are real but other factors have dampened investor response. This paper focuses on the more plausible explanation. Specifically, we argue that investor-host country disputes regarding the jurisdiction of the applicable BIT reduces the benefits of BITs by raising investor concerns about investor rights in the both the particular host country and possibly other host countries as well. We show that these disputes decrease the flow of future investment.

The proposition that a bilateral investment treaty can increase foreign direct investment to a host country is based on credible commitment theory, Yackee(2008). It suggests that significant non-compliance costs deter a host country from renegeing on its obligation to safeguard investor rights covered by the BIT. These costs include the reduction of potential FDI flows when foreign investors sense a heightened risk of host country abrogation. A dispute over BIT provisions can cause the loss of national prestige. This results from a key BIT provision that gives the investor the right to bring any dispute with the host country to an international arbitration panel.

In addition, a BIT can mitigate the problem of host country dynamic inconsistency. After the investor's FDI has become sunk costs, the host country could extract greater payments from investors by threatening to renege on its promise to protect the foreign investor's property. Property rights and the institutions that protect them are considered important to foreign direct investors; they will either increase their commitment levels in countries with the best institutions and/or divert resources from those with relatively weaker institutions and or no long term history of commitment to the protection of property rights. Countries without a credible history of enforcement can demonstrate their future commitment by signing binding agreements that substitute foreign institutions and arbitration in place of the weak domestic legal system. BITs can reduce foreign investor perception of risks due to host country's past behavior, thereby making foreign direct investment more attractive.

Using data from the World Bank Development Indicators, the OECD International Direct Investment Statistics and the International Centre for Settlement of Investment Disputes we investigate two basic questions:

1. Do BITs increase FDI flows to developing countries? Specifically do foreign investors believe that host countries are credibly committed to their obligations under the investment treaties?
2. Do foreign investors regard BITs as substitutes for strong institutions that protect property their rights from host country abrogation? Are foreign investors discouraged from investing in developing countries when they suspect a weakening of host country commitment to the investment treaties?

The rest of the paper is arranged as follows. Section B reviews the current literature on bilateral investment treaties and delineates our contribution to the discussion. In Section C we briefly refer to the microeconomic theory of foreign direct investment, the role of bilateral investment treaties in promoting optimal outcomes for the foreign investor, and the problem of dynamic inconsistency that precipitates disputes. We also provide the link between the microeconomic model and the macro variables used to explain the determinants of total foreign direct investment flows and the role of BITs in general. We then present our estimates and analysis in Section D, followed by our conclusions.

## 2. LITERATURE REVIEW

Empirical research on the impact of BITs has thus far left some important questions unresolved. Kumar (2007) suggests that riskier countries tend to attract a higher level of FDI, most likely because of the risk premium payable through such direct measures as tax holidays. Therefore BITs are unlikely to have much of an impact on FDI since they lower risk. The evidence is not very convincing since the wide dispersion of the countries in the risk/FDI plane allows for other potential relationships. Hallward-Driemeier (2003) estimates the impact of pair-wise BITs from data aggregated into five-year intervals. The dependent variable is the level of FDI normalized by the host country's GDP. The explanatory variables include relative GDP and GDP per capita, the share of trade in GDP and the existence of a BIT. The study finds (based on weak evidence) that BITs explain changes in the level of FDI. These results suggest that BITs do not substitute for effective institutions in attracting FDI, but the estimates on the interaction between BITs and institutional quality variables suggest that BITs complement relatively strong institutions. We argue that Hallward-Driemeier's dependent variable, FDI normalized by the country's GDP, is less suited to the fact that FDI flows go to alternative targets, than the host country's share in total foreign investment. Tobin and Rose-Ackerman (2006) use panel data on FDI flows from 20 OECD countries to 33 developing countries. The explanatory variables include an aggregate political risk index that incorporates more than just institutional quality. The host countries are classified as either high or low income. The BIT variable is the cumulative number of BITs signed by the host country. The results are counterintuitive, with a negative sign on BITs. Countries with significantly lower FDI flows from the OECD are likely to sign BITs with it, but the treaties do not improve overall investment levels. The sign on the political risk coefficient is also negative – the lower the level of risk the lower the level of FDI flows. The interaction of BITs and political risk however, shows that signing a BIT with an OECD country actually increases FDI from that source country as the political risks decline.

The cross section analysis based on cumulative investment flows does not account for the possibility that the BIT may initially stimulate inflows that may decline as the source country sign more agreements. In order to capture these effects Tobin and Rose-Ackerman use FDI flows from the United States. The results are also counter-intuitive, with a negative sign on BITs; countries with significantly lower FDI flows from the United States are likely to sign BITs with it. The sign on the political risk coefficient is also negative – the lower the level of risk the lower the level of FDI flows from the United States. The interaction of BITs and political risk shows that as the political risk goes down, signing a BIT with the United States actually increases FDI from the United States. Treaties may alleviate the level of risk to investors but they do not necessarily increase investment flows i.e. they may be a necessary but not sufficient condition. More importantly, however is the fact that isolating FDI from one source country ignores the potential impact of increasing BITs signed by other source countries.

Another approach has been to view bilateral agreements as a means of competing for the available capital (Elkins, Guzman and Simmons (2006)). OECD countries that are major sources of FDI signed BITs throughout a period lasting 40 years. The major host countries, however, show a more clustered pattern, with peaks in the decade 1990-2000. The authors view this as evidence of a programmatic activity. Host countries realize they must compete with other potential hosts for the available capital and accept agreements that have uniform clauses. Under this

competitive model, BITs should be more diffuse among countries where competition for capital is strongest (manufactured goods exporters, for example), or countries with similar investment opportunities. The number of BITs should increase as the pool of capital grows. Their empirical estimates support the competitive market hypothesis. However, there is no a-priori reason (or observed data) to believe that the supply of potential FDI flows during any period is a fixed pool; BITs can theoretically increase the total investible funds, Tobin and Rose-Ackerman (2006). However, we do test for this diffusion hypothesis by including the cumulative total of all BITs as an explanatory variable.

Elkins, Guzman, Simmons also found that common law countries were more likely to sign BITs than those with a civil code, where the former is generally perceived as more protective of property rights. High flows of FDI to host countries with a relatively high corruption index can also be reconciled if bilateral investment agreements provide an alternative to credible institutions. However, the corruption variable in the Elkins, Guzman, Simmons study was insignificant. The significance of the legal system would point to BITs as a signaling device – much as in Hallward-Driemeier (2003). Neumayer and Spess (2005) also use annual data on investment flows (expressed in real US dollars), but their sample includes more countries (120 as opposed to 63 for Hallward-Driemeier or Tobin and Rose-Ackerman). The BIT measure is the cumulative number of BITs the developing country has with the OECD countries, weighted by its share of outward FDI flow from the source country as a share of all OECD FDI outflows. Their results show that bilateral treaties have a positive and significant impact on investment flows and the results are robust across different model specifications.

The studies previously cited may have omitted a number of factors relevant to the effects of BITs on FDI flows. Implicitly, past studies have contrasted countries that have signed BITs with those that did not. But, there are other potential classifications. In particular, some countries sign BIT and subsequently renege on some of its provisions. If BITs signal host country commitment to protect investor property rights, then one would expect diversion of FDI to countries that signed BITs. Using the absolute number of BITs signed by the host or source country misses this aspect. Estimates based on time series data would also differentiate the impact on those who signed early from latecomers.

Countries that sign and then abrogate the terms of the BIT are different from countries that adhered to the terms. Both types are different from countries that never signed at all. Abrogating the terms affects not only the country in question but may impact on the commitment of all competing host countries to BITs, thereby lowering their attractiveness. The abrogation of the terms of BITs by a host country reveals that circumstances exist in which the cost of abrogation is less than the gains the abrogating country expects to capture. This increases the perceived risks of FDI, and hence lower FDI flows, not only to the abrogating country but to others as well.

When a foreign investor believes the host country might be abrogating the terms of a BIT, it can seek remedy by filing a dispute with an international arbitration panel. Therefore, dispute cases arbitrated by the ICSID should have a negative effect on future investment flows into that country and possibly to other host countries that signed BITs. To the extent that disputes have a negative effect on FDI flows, previous studies that have not accounted for the impact of dispute cases on FDI flows may suffer from an omitted variable problem. We include in our model the number of ICSID cases resolved.

Previous empirical estimates may have also omitted the effects of a “home country bias.” Virtually every BIT includes a provision that protects the foreign investor from “home country bias;” that the foreign investor be treated no different than a domestic firm. All else being equal, preference for “home goods” is usually a part of the decision maker’s utility function, Aharanovitz (2009). There is increasing pressure on host governments to protect the domestic content of FDI during recessions or in mature investments that face declining profit rates (and hence, tax revenues). This shift in the objective function of government has been shown to be optimal if the objective of government is to maximize domestic content, Grossman(1981). The investment source country (as the agent for the investor) has the same objective. The investment treaty clauses are meant to extend this “home bias” advantage beyond the source country’s borders by securing access only to the signatory source countries. An appropriate measure of home bias would be the degree of openness of the domestic market represented by the imports of manufactured goods as a percentage of the gross domestic output. All else being equal, a country with a higher degree of openness should attract more FDI. Conversely, the more open an economy gets over time the more FDI it should attract. Host countries without a history of openness can overcome the reticence of investors by guaranteeing them preferential treatment for their imported inputs through an investment agreement. Similarly, for host countries with a high degree of openness, BITs may be less robust in attracting investment.

Previous studies have included the protection afforded against expropriation and the vagaries of the host country’s legal and political systems. The variables used to capture the effect on foreign direct investment include measures of corruption, political stability and protection of property rights. While these studies have included political and institutional instability as a potential determinant of FDI flows, they have omitted the effects of economic instability. Typically they include per capita GDP growth of the host country, but the inclusion of this variable is meant to account for market size and potential rather than economic instability. We believe that FDI response to economic instability, all else constant, depends on investor attitude toward potential gains and losses. Thus the response could be negative even if the relative fluctuations are symmetric around the mean. Our study explicitly accounts for the effects of economic instability omitted in past studies.

According to the diffusion hypothesis the total value of FDI flows to each host country should decrease as the number of BITs increases. In addition, a country that does not sign BITs, while others do, risks FDI diversion, Guzman (1998), Elkins, Guzman, Simmons (2006), Bubb and Rose-Ackerman (2007). The empirical estimates from other studies do not support this critical implication and thus the model is left in limbo. We contend that outcome results from the omission of a variable that explicitly relates the change in the total number of BITs to the level of FDI in each country. The BITs variable in our study addresses this omission.

Finally, one might argue that the apparent positive relationship between FDI flows and BITs reflects a form of reverse causality, wherein relatively high FDI flows precede and cause the implementation of investment agreements. We believe the argument that there is some merit with respect to the timing of the effects of a BIT, but the reverse causality component has little merit on theoretical grounds. Reverse causality is based on either of two propositions. First, investors anticipating the signing of a BIT with a host country, increase their investment activity well before the BIT’s implementation date. An example of this type of behavior was the dramatic

increase in net US foreign direct investment into European countries beginning in 1989 when the Delors Commission recommended the implementation of the European Monetary Union in three phases. Investors from the US anticipated the implementation of the provision on the free movement of capital within the EU and dramatically increased their European assets. The second proposition suggests that investors, subsequent to their direct investment, pressure the host country into signing a BIT, presumably to strengthen the protections of their investment.

The first proposition is consistent with the traditional argument that BITs are instrumental in attracting FDI by committing the host country to protect the investor's interests. However, it suggests that the investor's decision on when to invest is sometimes predicated not on the actual ratification of a BIT, but rather on the expectation that the BIT will in fact be implemented. While it is problematic to obtain data that reflects the exact moment when investors become convinced that a BIT will be ratified, we address this problem by using the date when the BIT was first negotiated and signed. This approach has the additional appeal that empirically in countries undergoing economic reform, FDI stocks from a source country prior to the signing of a BIT are much lower than in countries that have the market institutions in place.

The validity of the second proposition (that existing FDI levels cause the negotiation of treaties) is dubious on two grounds. First, in view of what was stated in the previous paragraph and as illustrated in the charts, there is very little empirical support that FDI flows from a source country precede the initial broaching of a BIT at levels that match post-BIT levels. In all cases, FDI levels increase significantly after a treaty is signed. Second, the implication of this proposition that FDI flows drive the signing of BITs, runs counter to what virtually every BIT states in its preamble; namely that the purpose of the BIT is to promote future FDI into the host country.

### 3. THE FDI MODEL AND THE ROLES OF BITS

We begin with a simple discrete time model that incorporates bilateral investment agreements into a basic investment decision. We capture the possibility of dynamic inconsistency by explicitly modeling the possibility of the host country renegeing on the agreement, thus triggering a dispute with the foreign investor. Such disputes increase investor perception of risk and discourage future capital inflows. Our empirical estimates test for this inconsistency and also account for home bias preferential treatment and host country political and economic instability. We also account for the competitive diffusion hypothesis by testing whether investments decrease with the overall number of treaties signed over time. We include the cumulative number of cases brought before arbitration panels as a percent of all cases to date to measure the impact of disputes on investment in the particular host country as well as any 'herd effects' – i.e. that an increasing number of arbitration cases may reduce the effectiveness of all investment treaties in attracting FDI. Finally, we include the usual "robust" control variables as determinants of FDI as summarized in Chakrabarti (2001).

It is useful to analyze the interactions between the foreign investor and host country in five periods, beginning after an umbrella BIT has been signed. In the initial period,  $t=0$ , the two parties negotiate the terms of the FDI. In exchange for the permission to set up production in the host country, the foreign firm agrees on a tax rate,  $\gamma$ , on the profits from the production facility. On the one hand, the foreign firm of course prefers that it pay zero taxes to the host country and

exits the country if the tax rate exceeds some level,  $\gamma_m$ . On the other hand, the host country prefers a tax rate  $\bar{\gamma} < \gamma_m$  that maximizes its tax revenues. Since  $\gamma = 0$  and  $\gamma \geq \gamma_m$  result in zero tax revenue for the host country, and since there are  $\gamma$ 's in between 0 and  $\gamma_m$  which generate positive tax revenues, then we shall suppose that  $\bar{\gamma}$  exists. We further assume that the negotiated tax rate will be somewhere between these two extremes. A simple, yet reasonable negotiated settlement has the two parties agreeing on the average between the two extremes, namely  $\gamma^* = \bar{\gamma}/2$ .

In the second period,  $t = 1$ , the foreign firm decides on the amount  $X$  to spend to adapt its production technology for application in the host country. We shall think of  $X$  as the amount of new technology the firm exports to the host country. We shall assume that  $X$  is known only by the foreign firm and not by the host country and that it is specific to the host country and therefore sunk once it is made.

In period  $t = 2$ , given the choice of technology,  $X$ , in period  $t = 1$ , the foreign firm chooses the level of inputs of labor  $L$  and capital  $K$  to maximize its before tax profit,  $\pi$ , where

$$\pi = PF(L, K : X) - wL - rK. \quad (1)$$

We assume that the firm takes the price of output,  $P$ , and input prices,  $w$  and  $r$ , as given.

The firm's production function,  $F(L, K : X)$ , is assumed to possess the following properties:

- (a) It is continuously differentiable, strictly increasing and strictly concave in its three variable,  $L$ ,  $K$  and  $X$ ;
- (b) there exists  $X_m > 0$  sufficiently small such that  $\max_{L,K} [PF(L, K : X_m) - wL - rK] - X_m = \epsilon > 0$  and  $F(L, K : X) = 0$  for all  $L > 0$ ,  $K > 0$  whenever  $X < X_m$ ;
- (c)  $F(L, K : X) \rightarrow 0$  when either  $L$ ,  $K$  decrease to 0 for  $X \geq X_m$ ;
- (d)  $F(L, K : X) \rightarrow \infty$ , when any of  $L$ ,  $K$ ,  $X$  go to infinity;
- (e) the partial derivatives,  $F_i \rightarrow 0$  as  $i \rightarrow \infty$  and  $F_i \rightarrow \infty$  as  $i \rightarrow 0$ , for  $i = L, K$  or as  $X \rightarrow X_m$ .

We assume that the host country can observe all prices as well as the quantities of output the firm produces and the inputs the firm employs. That is, it knows the amount of the firm's profit. In the fourth period,  $t = 3$ , the host country may choose to violate the terms of the initial FDI agreement and raise the tax rate,  $\gamma$ , on the foreign firm's profits. Presumably, the reason for raising the tax rate is to capture a greater share of the quasi rents  $QR = \pi - X$ .

In the event that the host country has raised the profits tax rate, in the last period,  $t = 4$ , the foreign firm has three options. First, it can refuse to pay the tax, thereby indicating that it will exit the host country. The country-specific investment  $X$  is thereby lost to the firm and there will be no future investment flows, not only from that specific firm but possibly others from the same host country. Second, it can acquiesce and simply pay the additional tax and continue to do business in the host country. Third, it can agree to pay the additional tax under protest that the tax increase violates the initial terms of the FDI and the BIT. In this case, the firm will lodge a formal complaint and will leave it up to the ICSID to resolve the dispute. If the decision upholds the tax rate increase, the foreign investor will in future choose a different level of technology,  $X$ , to reflect the higher tax rate. In all likelihood, this will also reduce future capital

inflows. In the event the host country chooses not to raise the profits tax or if the ICSID decides in favor of the foreign investor, the relationship between the two parties continues indefinitely as spelled out in the initial FDI agreement.

We begin the analysis with the firm's optimization problem in period  $t = 2$ . Given the tax rate and the choice of technology,  $X$ , in the previous periods, the firm chooses  $L$  and  $K$  so as to maximize profits given by (1). The first order conditions defining the optimal input strategies,  $L(X)$  and  $K(X)$ , are:

$$F_L(L, K : X) = w, F_K(L, K : X) = r. \quad (2)$$

The assumed properties of the production function insure that the solutions in (2) exist and define the maxima.

In period 1 the firm knows the rate,  $\gamma$ , at which the profits from its production activities in the host country will be taxed. It also knows that its choice of technology,  $X$ , in the current period, will be accompanied by its optimal employment of inputs,  $L(X)$  and  $K(X)$ , in period  $t = 2$ . Hence, in period  $t = 1$ , its optimal choice of technology,  $X(\gamma)$ , will maximize its net returns,  $V(X) = (1-\gamma)\pi(X) - X$  or

$$V(X) = (1 - \gamma) \{PF(L(X), K(X) : X) - wL(X) - r(X)\} - X. \quad (3)$$

Define  $\gamma_m \in (0,1)$  such that  $(1 - \gamma_m) \gamma(X_m) - X_m = 0$ , where from our assumptions, above,  $\gamma_m$  is close to one. Then,  $\max_X V(X) > 0$  for all  $\gamma < \gamma_m$ .

For  $\gamma < \gamma_m$ , the first order condition for the maximization of (3) with respect to  $X$  yields the following:

$$V'(X) = (1 - \gamma) \{PF_L L' + PF_K K' - wL' - rK'\} + (1 - \gamma)PF_X - 1 = 0. \quad (4)$$

Using the first order conditions in (2), the term in the braces in (4) vanishes, resulting in the following first order condition that determines the optimal choice of technology  $X(\gamma)$  :

$$(1 - \gamma) PF_X = 1. \quad (5)$$

The second order condition for a maximum is  $V''(X) < 0$ . We show (see Appendix A) that this inequality holds provided

$$\frac{dF_X}{dX} = F_{XL} L' + F_{XK} K' + F_{XX} < 0. \quad (6)$$

Since  $F$  is assumed to be strictly concave, then  $F_{XX} < 0$ . So (6) implies that the negative effect of  $F_{XX}$  must dominate the sum of the cross effects,  $F_{XL} L'$ ,  $F_{XK} K'$ , of technology on the input requirements.

Thus, given the host country's tax rate,  $\gamma < \gamma_m$ , on the profits the foreign firm stands to earn on its FDI, the solution,  $X(\gamma)$ , to (5) gives the amount the firm is willing to invest in set-up technology in order to operate in the host country. If  $\gamma \geq \gamma_m$ , the optimal action for the firm is to not make the up-front investment since rents will never be positive, ie.,  $X(\gamma) = 0$ .

To recapitulate, once the two parties agree on  $\gamma^*$ , the foreign investor sinks  $X(\gamma^*)$  on technology in order to set up production in the host country. Once production takes place, profits are generated

amounting to  $\pi(X(\gamma^*))$ . Given the terms of the FDI contract, the host country collects tax revenues of  $\gamma^* \pi(X(\gamma^*))$  and the foreign investor earns rents

$$V(X(\gamma^*)) = (1 - \gamma^*) \pi(X(\gamma^*)) - X(\gamma^*). \quad (7)$$

After period 4 the host country realizes the investor vulnerability and that it can increase its tax revenues by demanding a higher tax rate,  $\gamma > \gamma^*$  and still retain the technology within its borders. Because the foreign investor is unable to change its technology, ex post, it is stuck with the technology  $X(\gamma^*)$  with which to carry out production. Thus, the profits from the FDI remain  $\pi(X(\gamma^*))$  and the quasi rents also remain unchanged. Only the shares of the quasi rents are changed when the host country reneges on the agreement: It captures a larger share at the expense of the foreign investor. As long as the host country does not increase the tax rate too much, so that  $(1 - \gamma) \pi(X(\gamma^*)) - X(\gamma^*) \geq 0$ , the foreign investor will continue to operate its plant in the host country rather than exit. However, the investor would lodge a complaint against the host country for violating provisions of the BIT. Thereafter, additions to the capital stock ( $K$ ) could be lower than would have been the case under the negotiated  $\gamma^*$ , particularly if the violation introduces a level of uncertainty about future policies or the return on rents now yield a return lower than at home or elsewhere, as might be the case if the ICSID decision upholds the higher tax rate..

Quasi rents could decrease over time (due to increasing costs) such that they make up only a small proportion of the total revenues. In that case an alternative strategy for the host country could be to maximize the domestic content of total revenues, Grossman (1981). In that case, since the choice of technology ( $X$ ) has already been made (and may still be unknown to the host government), the change is in the optimal level of factor use, with the price of capital now  $(1 + \tau)r$ , where  $\tau$  is the tax on foreign capital. Whether the domestic content increases depends on the elasticity of substitution at the margin in response to changes in the relative factor prices as well as the output response (assuming constant prices). Output can respond in any direction regardless of whether the inputs are complements or substitutes. In any case the optimal capital tax would have to be such that the gains in labor use at the margin equal the loss of profits due to any changes in output. If output does decline and quasi rents turn negative the investor will see the tax as a violation of the BIT provisions. Whether he files a grievance depends on whether the expected net benefits from the arbitration are significant. In any case, future capital flows would decline.

Bilateral investment treaties however, are negotiated for all potential investment from the particular source country. The empirical models therefore are estimated within a macroeconomic framework and macro variables have to substitute for the project specific microeconomic control variables. Across countries some may not get FDI because of relatively high set up costs associated with the technology ( $X$ ). These may have to do with time invariant, country-specific factors like distance, geography, lack of physical infrastructure, etc. While these factors can be measured in dyadic models they should be captured in the constant term in our estimates.

1. The optimal time horizon for the recovery of the set-up costs implicit in (1) depends on the discount factor at the time the commitment is made. The present value is reduced to zero from the date the investment is expropriated. Other actions that result in a

longer set-up cost recovery period include unanticipated changes, (e.g., in foreign exchange regulations in response to a domestic crisis) that delay the realization of gains by foreign shareholders. The BIT is meant to ensure the foreign investor gets paid the full value of equation (1), including the set-up costs in the case of outright expropriation. The discount rate therefore is a function of the political risks as perceived at the time the investment is initiated and we represent these by the usual indices of political and government commitment to property rights.

2. Bilateral investment treaties also protect against a reduction in the present value through discriminatory increases in imported input prices by requiring that the foreign investor be treated the same as domestic ones for regulatory purposes (akin to the 'most favored nation' clause in international trade). They also have been used to provide a basis for firm-specific contracts designed to protect against selective countercyclical policies that might adversely affect their investments (as an example, see Appendix C, LGE vs Argentina). The probability of such countercyclical policies is higher in countries with a higher level of economic instability (most probably due to a low ratio of domestic content in total output), a risk that is different from that posed by the lack of effective political institutions. BITs have been used ostensibly to protect against decreases in the present value due to a regulatory 'home bias' in favor of domestic inputs or consumers after the investment is made (see Appendix C: Fireman's Fund vs. Mexico) or to changes in regulations (including bureaucratic measures) that increase the set-up costs  $C_h$  after the commitment has been made (see Appendix D: Maritime International vs. Guinea).

We now summarize the explanatory variables used in our estimation.

#### Bilateral Investment Treaties (BITs)

Most studies have focused on the protection that BIT's provide foreign investors against expropriation without compensation and the provision for binding external arbitration of disputes. In addition, however, all BITs also address the tendency of governments to have a "home bias" (described above) in their discretionary policies through a clause requiring that FDI be treated the same as domestic investment for regulatory purposes. Bilateral agreements should therefore have a positive impact on aggregate flows of FDI to countries that are perceived to have a home goods bias. All else being constant the estimated coefficient for the import ratio should therefore be positive for those countries with BITs.

#### Disputes

Appendix B summarizes the number of cases arbitrated by the ICSID in which a decision was rendered. The total number of cases included in our empirical estimates is 231 and includes cases in which no decision had been rendered by 2009. We exclude the cases without a decision in Appendix A because the factual basis for the grievance and decision was not available. The distribution of the cases by country and sector is no different from that of the sample where a decision was rendered.

The breadth of sectoral coverage as well as the number of countries involved indicates that the cases are not random events. A significant number of the disputes involved violations of

contractual agreements on investments in privatized public utilities (gas and water distribution) and municipal services (waste management). Most of these involved pricing and tariff agreements, with only a small proportion were over an actual expropriation of the foreign capital. Other disagreements involved the refusal by government to grant of licenses to operate facilities, taxes that were considered discriminatory, or other preferences in favor of domestic competitors.

We believe that the number of cases over time is a proxy for this perceived discrimination and breakdown in the host country's commitment to the BIT and should have a negative impact on aggregate flows to the country. Furthermore, the flows should decline as the number of cases filed against an individual country increase. We also include as a variable the cumulative number of cases filed against all host countries to account for a possible 'herd effect.' Specifically, we include the cumulative number of cases for preceding years in each country as a proportion of all (cumulative) cases filed against all host countries. The data on BIT's as well as the number of cases were obtained from the UNCTAD UNCTAD, Bilateral Investment Treaties (Investment Instruments Online) and the International Centre for Settlement of Investment Disputes (ICSID) website, respectively.

#### Market Size

The log of GDP per capita and total population represents the market size (and potential revenues) and the variables should have a positive effect on FDI designed to supply the domestic market in the host country. The data are from the World Bank's 2008 Development Indicators CDROM.

#### Degree of Openness

Membership in international trade agreements and the ratio of exports and imports to GDP both measure the degree of openness in previous studies. The observed results depended on the measure of openness. When the variable was the sum of exports and imports as a percent of GDP the estimated coefficient sign was positive. If exports were excluded the sign is negative (see Chakrabarti (2001, for the relevant studies). Membership in trade agreements has almost become universal, rendering that variable irrelevant as an explanatory variable. Within the context of foreign investment, a host country exhibits a 'home goods bias' by regulating against such imported inputs as foreign management and by imposing FDI-targeted performance criteria. We therefore use only the ratio of intermediate imports to GDP as our measure of 'degree of openness'. We believe imports better reflect the degree of openness because they can be regulated through tariff and non-tariff barriers. A low level of openness, all else constant, would indicate a bias for domestic output of finished goods and this might discourage FDI designed to supply the domestic market. Greater import penetration improves efficiency and lowers costs. A greater level of protectionism might also portend future cost increases for FDI producing for export but dependent on imported inputs. Greater openness should therefore have a positive impact on FDI, all else being constant. We test for the possibility that the interaction of the import ratio and BITs, all else being equal, should have a positive effect on FDI. The import ratio data are from the World Bank Development Indicators database.

### Economic and Political Instability

Productivity and economic shocks are represented by the deviation of the per capita GDP growth rate from the mean growth rate of OECD countries during that year. Figure 1 shows country growth rates for the years where data are available for each country (but within the period 1961-2007). The plot shows that the actual rates are distributed almost symmetrically around the mean for all countries. We use both positive and negative deviations as a single variable and then test for symmetry by splitting them into two separate variables. The sign for the estimated coefficient should be negative for negative deviations. The data used in computing the index are from the World Bank Development Indicators.

As mentioned in the Introduction, FDI flows to developing countries are also negatively affected by institutional and political instability and bilateral treaties are designed to offset this impact. The most widely used in empirical estimates are political risks (of expropriation) and judicial bias against FDI in the settlement of disputes with the host country. We include as an explanatory variable the World Bank index of political instability and the overall efficiency in managing the economy (POLCON).

## 4. MODEL AND ESTIMATION

Following Hausman and Taylor (1981) and Greene (2008) we use Hausman and Taylor's estimation technique as per the econometric software in Limdep 8.0 (2002). The reader is referred to Greene (2008, Section 12.8) for details of the Hausman-Taylor methodology we use in our estimation.<sup>1</sup>

Our panel included 143 developing countries and the data period 1961-2006. The panel is unbalanced since some of the Eastern European countries did not exist prior to 1990 and the time-series data for some other countries begin after 1961.

Table 1 gives the summary statistics. Table 2 presents the estimated results. OLS estimates in Column 1 assume that all the countries are the same and are therefore only an approximation of the response of foreign direct investment to developing countries. We then use the Hausman Taylor estimator for panel data and the results are presented in Columns (4), (5) and (6). Our conclusions are based on this model since it corrects for possible endogeneity between the time invariant variables and the individual effects. The fixed and random effects model estimates in Columns (2) and (3), respectively do not make such a correction and are presented for readers who might be interested in comparing the effects of making endogeneity corrections.

### BITS

The coefficient sign shows a positive and significant correlation with FDI. This result supports the hypothesis that BITs signal to foreign investors that the host country credibly commits to protect investor property rights without "home-country bias." The squared term of the BITS variable was statistically insignificant, as was the cumulative number of all BITS. The latter result does not support the competitive market diffusion hypothesis that an increasing number of bilateral agreements will reduce the returns to BITS and hence reduce FDI inflows.

### Market size

Both population and per capita income are significant with the expected sign. The deflator is negative but statistically insignificant. Lagging the variable does not change the results.

### Degree of Openness

The share of imports in GDP significantly and positively impacts FDI inflows into host countries. This result is robust to the different specifications reported in Table 2.

### Economic Instability

The coefficient is negative and statistically significant for downward instability, positive but insignificant for upward swings above the sample mean. The suggestion seems to be that countries that are prone to economic contractions pose greater risks for foreign direct investment and are likely to have less FDI. The response to upswings is not statistically significant, all else being constant. The implication is that growth above the mean for the host countries may not attract FDI, if the positive marginal profitability effect of increased demand is offset by the negative profitability effect of increased input and factor costs, Razin, Sadka, Tong (2005).

### Political Instability

The sign on POLCON is as expected – negative and significant in all cases and regardless of the size of the lag. Thus, host countries with greater political instability are likely to receive smaller inflows of FDI, all else being equal. The interaction variable between POLCON and BITs is insignificant. Because both BITs and POLCON are significant, then the result on their interaction suggests that each has a significant effect on FDI flows, independently of the other; a BIT can compensate for some institutional weaknesses such as ‘home country’ bias, whereas high-quality institutions attract FDI even in the absence of a BIT.

### Disputes

Our claim that the models of previous studies omitted the impact of treaty violations is supported by our result that the coefficient of the ratio of each country’s cumulative share of all dispute cases is as would be expected, negative and statistically significant. Thus, countries that reveal an inclination to abrogate their obligations under the BITs they have signed will lose FDI. The coefficient on the total cumulative number of all BITs was very small and statistically not different from zero. Consequently, we find no evidence of a “herd” effect, where a general increase in total number of disputes has a negative effect on individual host country FDI.

## 5. CONCLUSIONS

For almost twenty years observers have been studying the various mechanisms of how bilateral investment treaties might impact the flow of foreign direct investment to signatory developing countries. This paper proposes one such mechanism. It begins with the standard theory that BITs credibly commit signatory host countries to the protection of foreign investor property rights, thereby increasing FDI returns in the host country. The key to the credibility of the host country’s commitment to the BIT is the provision giving the investor the right to have disputes

with the host country arbitrated by international panels. Second, we observe that the BIT-constrained host country, nevertheless, retains wide policy flexibility as a sovereign nation, and still may choose to abrogate specific obligations made to foreign investors when the country's interests dictates. In these circumstances, the foreign investor may file a dispute and have the case resolved by an ICSID arbitration panel. Third, we argue that the dispute itself lowers the perceived credibility of the host country's commitment than would otherwise be the case and thereby will mitigate some of the BIT's influence to attract FDI.

Our empirical analysis of the determinants of FDI flows to developing countries generally supports the mechanism described above. Specifically, we find that BITs are significant in attracting FDI flows. Moreover, as disputes can undermine the perceived host country's commitment to honor the BIT we find that they can have a significant negative effect on FDI flows. Because previous studies have not included BIT disputes as an explanatory variable of FDI flows, our results suggest that they have omitted an important determinant. We therefore suspect that this shortcoming has resulted in an incomplete understanding of the effect of BITs on FDI flows.

Our study finds two additional results not obtained in previous studies. First, we consider the effects of host country economic instability on foreign direct investment. We discover an asymmetry in the response of FDI flows to downside deviations versus upside deviations of host country per capita GDP from the average per capita GDP of OECD source countries. Specifically, downside deviations have a significant negative effect on FDI inflows from the source countries whereas the upside deviations have no significant effect. This is consistent with the argument that investment discouraging risk is primarily transmitted through periods of economic contraction, relative to the source country, rather than through periods of relative expansion. Perhaps this may help explain some of the disillusionment with the benefits of FDI in some host countries.

Our second novel approach revisits the way 'home country bias' and the degree of openness are measured in host countries. We argue that the ratio of intermediate imports to GDP is a better measure of the importance of host country openness to the purposes of most foreign direct investment. A relatively large volume of intermediate goods imports indicates some restraint by the host country from discriminating against foreign economic activities, thereby enhancing the prospects for profitable investments. Our results support this hypothesis.

The analysis and results reported in this paper make important contributions to the understanding of the impacts of bilateral investment treaties on foreign direct investment in developing countries. The dispute cases sampled in this study are often concerned with perceived investment contract violations under microeconomic conditions, whereas the provisions of the investment treaties fall under a more general macroeconomic framework. Thus, the BIT's arbitration clause allows for the introduction of microeconomic factors in investment contract disputes, even though the general framework of the BIT is macroeconomic. To take an example, consider a BIT that allows the host country the latitude for a monetary and/or fiscal policy to address an unexpected economic downturn or to quell public discontent. To the extent that the policy adversely affects a privatized foreign enterprise, the enterprise may be allowed to seek

an award of compensation by appealing to the arbitration panel on the grounds that the effect of the policy violates the terms of its investment contract with the host country. Thus, even if the host country's institutions do not afford sufficient property rights protection to the foreign investor, the BIT serves as a temporary substitute for investor-friendly institutions.

Our analysis implies that BITs do enhance FDI flows into host countries. We also find that an apparent tendency for the host country to abrogate its treaties, as evidenced by disputes brought to international arbitration panels, can have negative effects on investment flows. We infer from this that while BITs serve as temporary, if imperfect, substitutes for institutional protections, they do not obviate the need for credible reforms to establish domestic institutions that create a more predictable environment for foreign direct investment.

#### Notes

1. The Hausman-Taylor estimation (see LIMDEP, 2002, Vol. 1, Chapter E8.25) requires the partitioning of the right-hand side variables into the following: a) The time-varying variables that are regarded as uncorrelated with the country-specific error term are as follows: Log of Population, GDP Deflator, Share of Imports in GDP, Interaction BIT-POL. b) The time-varying variables that are regarded as correlated with the country-specific error term are as follows: Log of Per Capita GDP, Downward Instability and Upward Instability. c) The time invariant variables that are regarded as uncorrelated with the country-specific error term are as follows: POLCON, Country BITs signed, BITs signed by all countries, Country ICSID cases, All Cumulative ICSID cases. d) Our data do not include time-invariant variables correlated with the country-specific error term, thus since the number of variables in a) is greater than in d), the model is identified as per Greene (2008).

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Table 1  
Descriptive Statistics

Variable	Mean	Std Deviation	Minimum	Maximum	Cases
LNPOP	15.5554329	1.91497307	10.6000000	20.9900000	3939
LNGDPPC	6.97248794	1.23695335	4.39000000	10.2100000	3939
GDPGR	1.78150800	6.20323224	-47.0800000	90.0700000	3939
GDPDEF	62.9572379	639.908372	-29.1700000	26762.0200	3939
FDI	358123889	1.45672056	-21.7700000	37.4800000	3939
IMPORTS	42.1164128	23.7448477	1.05000000	220.920000	3939
BITs	.469576035	.877549951	.000000000	13.2500000	3939
POLCON	.197407972	.209549951	.000000000	.690000000	3939
ICSID	.839908606	3.51566676	.000000000	100.000000	3939
ALLL	46.4539223	53.4785272	.000000000	201.000000	3939

- LNPOP: Log of population size
- LNGDPPC: log of per capita income (in constant \$US)
- GDPGR : Per Capita GDP Growth rate
- GDPDEF: GDP deflator
- FDI: Foreign direct Investment (in constant \$US'000)
- IMPORTS: Total value of imports (constant \$US'000)
- BITs: The cumulative number of bilateral agreements signed by each country as a ratio of the total BITs signed that year
- POLCON: World Bank index of political risk
- ICSID: The cumulative number of cases filed for arbitration with the ICSID, by country
- ALLL: The cumulative annual number of all cases filed with the ICSID

Table 2  
Estimated Results<sup>1</sup>

Variable Name	OLS (1)	Fixed Effects Model(2)	Random Effects Model (3)	Hausman Taylor Estimator(4)	Hausman Taylor Estimator(5)	Hausman Taylor Estimates (6)
Log of Population	.2894*** (.0158)	-.2289* (.1145)	.2204*** (.0342)	.2632*** (.062)	.2638*** (.061)	.2778*** (.053)
Log of Per capita GDP	.2911*** (.0192)	.30*** (.0687)	.2636*** (.0427)	.3339*** (.0596)	.3352*** (.0590)	.3389*** (.055)
Instability Index	.0004 (.0035)	-.009** (.0031)	-.0063** (.0031)	-.0067** (.0031)	-	-
GDP Deflator	-.0002 (.0003)	-.0004 (.0003)	-.0004 (.0003)	-.0004 (.0003)	-.4823 (.3011)	-.4977* (.2990)
Share of Imports in GDP	.0051*** (.0012)	.0060*** (.0017)	.0052*** (.0015)	.0060*** (.0017)	.0055*** (.0017)	.0061*** (.002)
POLCON	-.6078*** (.1098)	-.2484 (.1395)	-.4438*** (.1277)	-.5422*** (.1673)	-.5132*** (.1664)	-.3593* (.199)
Country BITs Signed	.2162*** (.026)	.3140*** (.0373)	.3133*** (.0343)	.2956*** (.0485)	.2944*** (.048)	.3750*** (.075)
BITs signed by all countries	-	-	-	-	-	-.00003 (.00005)
Interaction BIT-POL	-	-	-	-	-	-.0797 (.204)
Country ICSID cases	-.0223*** (.0061)	-.0102 (.0063)	-.0101 (.0062)	-.0150* (.007)	-.0140** (.007)	-.0142** (.007)
All Cumulative ICSID Cases	-.0009** (.0004)	.0006 (.0005)	-.0005 (.0004)	-.0007 (.0004)	-.0006 (.0004)	-.0005 (.0004)
Constant	-6.3096*** (.3204)	-	-5.1540*** (.6752)	-6.3356*** (1.171)	-6.4022*** (1.1394)	-6.6722*** (1.026)
Downward Instability					-.0232*** (.006)	-.2363*** (.006)
Upward Instability					.0056 (.0049)	.0056 (.005)

1/ \*\*\* significant at the 1% level \*\*significant at the 5% level \* at the 10% level

Figure 1: GDP Growth Rates by Country, 1961-2007

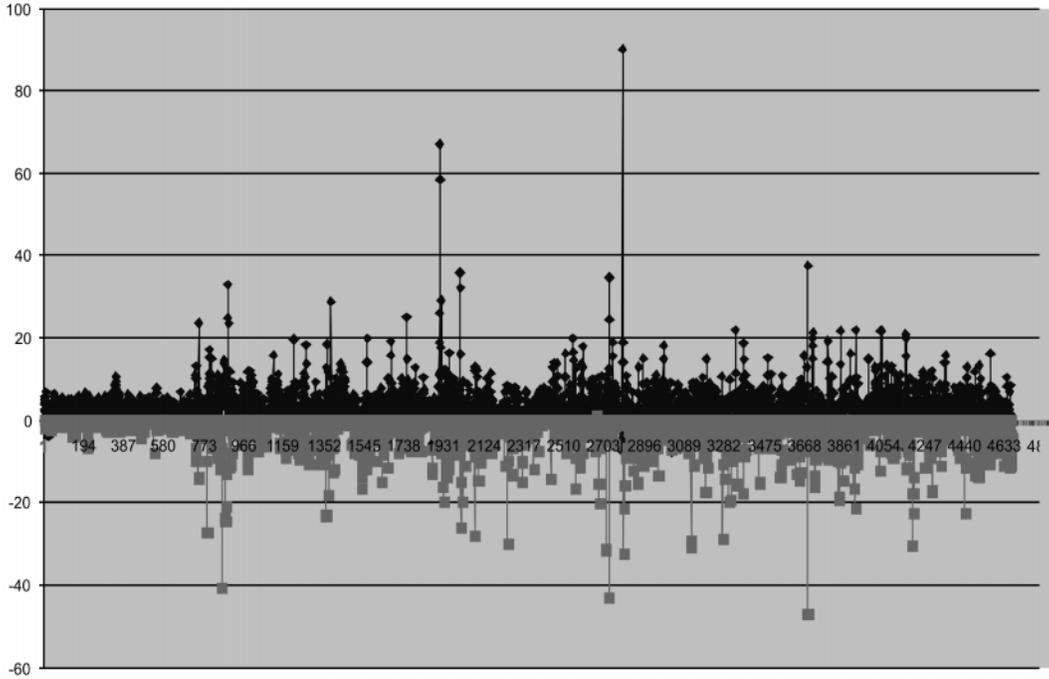


Figure 2: FDI from US to Countries that Signed BITs in 1991, as a Per cent of all US FDI to Non-OECD Countries

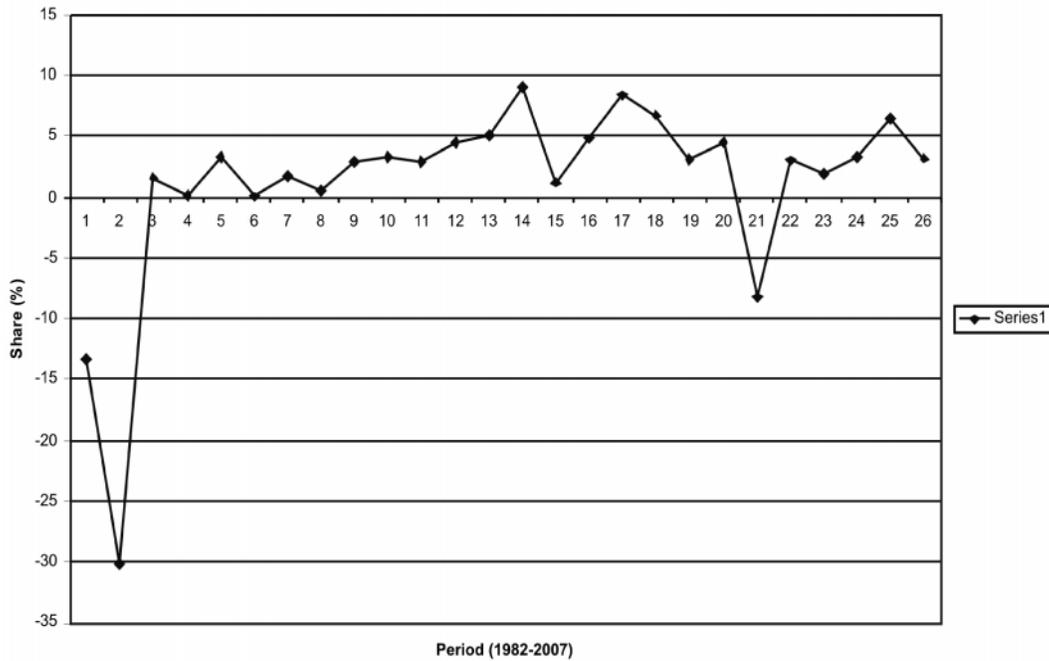


Figure 3: Share of USA Total FDI to Argentina, 1982-2006

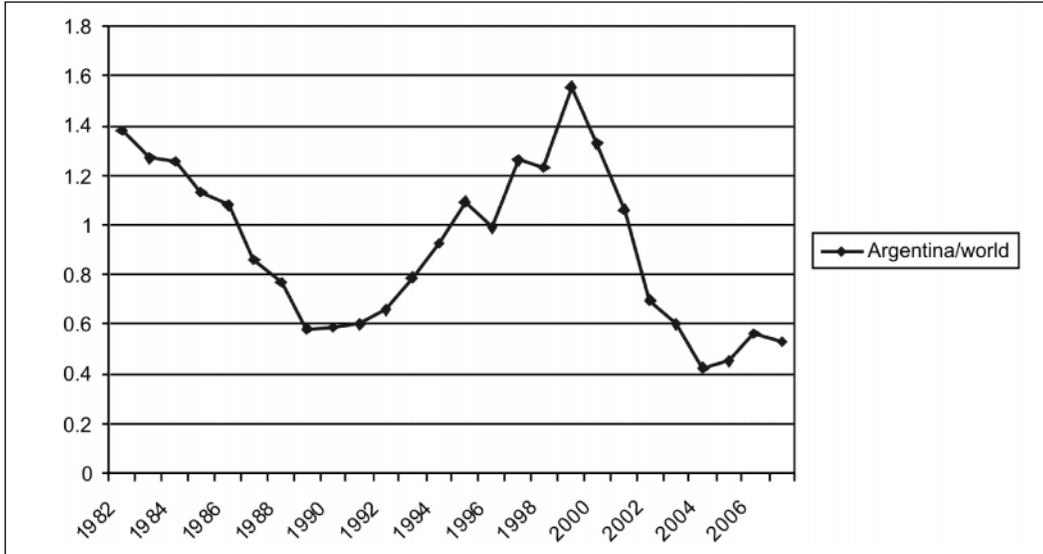
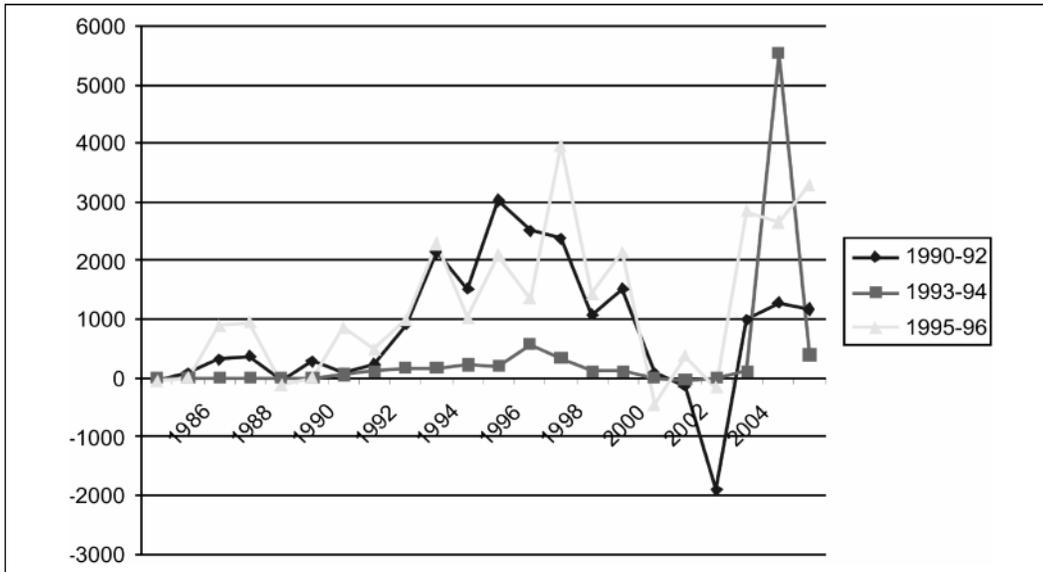


Figure 4: Total Non-OECD FDI from Germany to Countries with BITs with Germany, By Year of Treaty<sup>1</sup>



\*

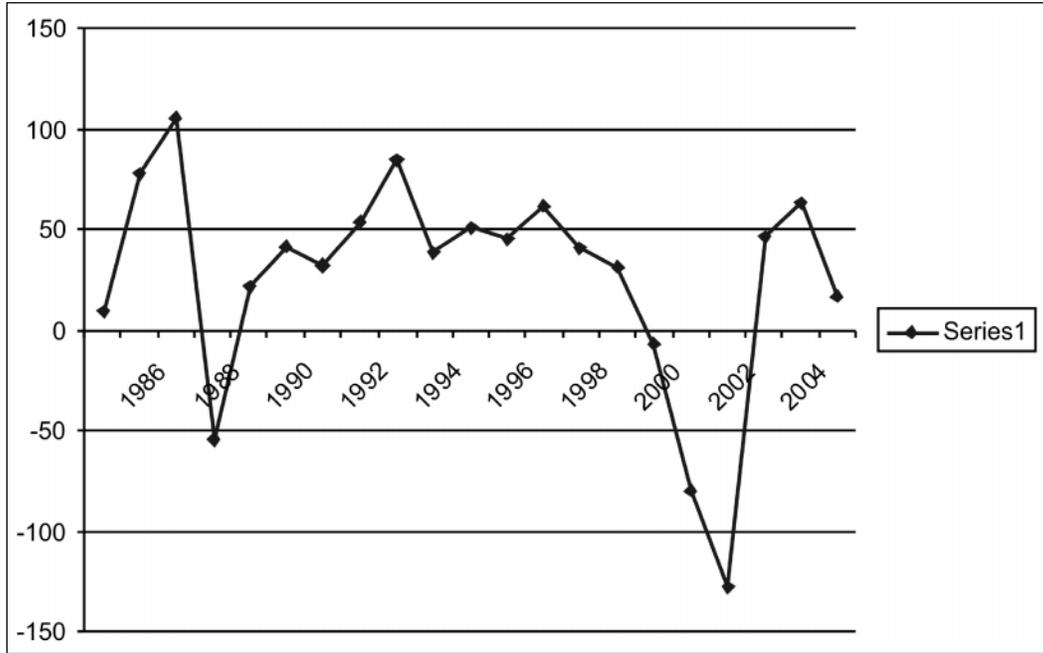
1983  
China

1990-92  
Czech Republic  
Albania  
Argentina  
Chile  
Estonia

1993-94  
Barbados  
Costa Rica

1995-96  
Algeria  
Brazil  
Burkina Faso  
Ecuador  
Honduras  
Armenia

Figure 5: FDI Share of All Countries that Signed BITs with Germany\*



\*Share is a percent of FDI flows from Germany to Non-OECD Countries

## APPENDIX A

Taking the second derivative of  $V(X)$  from (4) yields the following:

$$V''(X) = (1-\gamma)\{L''PF_L - wL'' + K''PF_K - rK'' + (L')^2F_{LL} + (K')^2F_{KK} + 2(L'K')F_{KL} + 2L'F_{LX} + 2K'F_{KX} + F_{XX}\} \quad (A.1)$$

Noting that the first order conditions in (2) for the optimal strategies,  $L(X)$  and  $K(X)$ , hold for all admissible values of  $X$ , the total differential yields

$$[F_{LL}L' + F_{LK}K' + F_{LX}]dX = 0, \quad [F_{KL}L' + F_{KK}K' + F_{KX}]dX = 0, \quad (A.2)$$

From which we obtain

$$F_{LL}L' = -F_{LX} - F_{LK}K', \quad F_{KK}K' = -F_{KX} - F_{KL}L'. \quad (A.3)$$

Substituting (A.2) and (A.3) into the expression for  $V''(X)$  and simplifying, yields

$$V''(X) = (1-\gamma)P[L'F_{LX} + K'F_{KX} + F_{XX}]. \quad (A.4)$$

Using the assumption (6), it follows from (A.4) that  $V''(X) < 0$ , as was to be proved.

APPENDIX B  
ICSID Arbitration Cases With Decisions, by Sector

Cause of Dispute	Sector	Number of Cases	Number of Host Countries Involved
Tariffs, Taxes	Energy	16	4
	Financial	1	1
	Mining	1	1
	Water Distribution	5	3
	Communications	2	1
	Manufacturing	1	1
Performance Criteria	Management Services	4	4
	Mining	1	1
	Energy	2	2
Licensing	Communications	1	1
	Construction	1	1
	Energy	1	1
	Waste Management	4	1
	Communications	2	2
	Financial	1	1
Expropriation	Services	3	3
	Agriculture	1	1
	Mining	2	2
	Transport	1	1

APPENDIX C  
Illustrative Disputes Submitted for Arbitration

Tariff Dispute: CGE vs Argentina (ICSID Case No. ARB/03/22)

The dispute between LGE and the Republic of Argentina was one of several disputes involving foreign investors in the privatized gas and water distribution services.

The basis for the LGE investment was established with the reform program initiated in 1989 and ensuing legislation to attract FDI. The Argentine State Reform Law of 1989 privatized the delivery of services, and encouraged foreign direct investment in gas and water distribution. The Convertibility Law of 1991 then pegged the value of the peso to the US currency, thus removing the risk of exchange rate fluctuations for foreign investors. The Gas Law of 1992 then established a regulatory agency (ENERGAS) to oversee the privatized industry and collect tariffs on the price of gas paid by consumers. The tariff would be designed to guarantee a rate of return to investors that would compete with returns in similar industries. The tariffs would be computed in US currency and then converted to Argentina pesos. Finally, the Basic Rule of the License of 1992 approved a prototype license that established the maximum tariff for the first five years and to be revised semi annually on the basis of movements in the US producer price index. Investors holding shares in the new, privatized units would be reimbursed for any losses caused by the tariff revision.

Foreign investment in the gas distribution industry during the period 1993-1999 totaled \$584 million. The 1998-2000 recession and the accompanying deflationary pressures resulted in an over-valued domestic currency. At the same time inflationary pressures in the US pushed up the producer price index, but the mandated upward tariff reviews for 2000 were politically untenable. At first both parties agreed to a postponement of the adjustment. In November 2001 the tariff adjustments were stopped altogether. In January 1996 Argentina abandoned the peg (under the Public Emergency Law) and abolished the mechanism of quoting tariffs in US currency. A month later there was a mandatory review of the licenses themselves, setting the stage for the dispute which was based on the bilateral investment agreement between Argentina and the United States. The CGE dispute was one of seven others involving the gas distribution sector during the period 2000-2002 and three others in the water and sewage services.

'Home Goods Bias': Fireman's Fund vs Mexico (ICSID Case No. ARB(AF)/02/1)

The dispute revolved around what the foreign investor felt was discriminatory treatment in favor of domestic investors, a violation of a provision of all BITs.

In 1994 Fireman's Fund (US) purchased \$50 million worth of mandatorily convertible debentures issued by a Mexican bank holding company (GF BanCreceer) which owned a Mexican bank, Banco BanCreceer. In 1995 GF BanCreceer issued debt of similar value to Mexican investors. In 1997 Banco BanCreceer faced financial difficulties and underwent a restructuring that included a renegotiation of its debt obligations. Fireman's Fund would redeem its debentures and reinvest them under certain terms in the restructured bank. On the other hand, Mexican investors could redeem their investment in cash. Fireman's Fund felt this was a violation of a clause in the investment agreement under NAFTA under which US investors would be treated the same as domestic investors. The underlying cause for the dispute seems to be the peso crisis of 1995 and the desire on the part of Mexican authorities to limit capital outflows in the face of balance of payments pressures.

Home Goods Bias: Maritime International vs Guinea (ICSID Case No. ARB/84/4)

The Republic of Guinea formed a joint venture (Compagnie des Bauxites de Guinee (CBG) with Harvey Aluminum of the United States. Harvey Aluminum in turn transferred its interests in CBG to HALCO, a subsidiary of six aluminum companies. HALCO then contracted to buy the CBG bauxite. The joint venture agreement stipulated that the Guinea shipping fleet would have the right to transport 50 per cent of the export tonnage at rates not exceeding market rates.

The dispute arose when the Guinea resisted paying a management fee to HALCO for work done outside of Guinea, contending the work could be done 'in-house' by the joint venture (CBG). The host country also would not grant the foreign investors the right to coordinate freight contracts with the recipient of the bauxite, presumably because that meant HALCO would oversee the country's shipping industry.

