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Does international commercial arbitration promote Foreign direct investment?*†

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Abstract

This paper explores the role that international commercial arbitration plays in facilitating foreign direct investment (FDI). International commercial arbitration is a system of private commercial law that enables firms to more effectively enforce contracts by allowing them to avoid inefficiencies that arise from domestic courts. As a result, access to international arbitration should foster FDI. To explain the effect of international arbitration on FDI, this paper develops a model to explain the use and effect of resolving international disputes through arbitration. The predictions of the model are tested empirically in a gravity framework. The results of this analysis suggest that access to arbitration leads to an increase in FDI flows. This increase largely occurs through a change in volume of investment with a much smaller effect on the number of investment projects. The effect of arbitration is greater for countries with weaker institutions and for larger projects.
Keywords: International commercial arbitration; foreign direct investment; legal rights; gravity equation; incomplete contracts; contract enforcement.
JEL Classification: F20, F21, F23, K120

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1 Introduction

The majority of contracts that cross borders implement mechanisms to settle disputes through international commercial arbitration. In this system, disputes are adjudicated before private tribunals and the resulting awards are enforced in domestic courts. The role that arbitration plays in the enforcement of international contracts suggests that arbitration is likely to be an important mechanism for facilitating FDI.

Despite the widespread use of arbitration by multinational enterprises (MNE) only a few papers have discussed its impact on FDI. Consequently economists have failed to fully explore several questions to do with international commercial arbitration and FDI. For example, does access to arbitration affect the volume of FDI or the number of investment projects? What are the benefits of ratifying an international convention that aims to facilitate the use of arbitration? As a result, the link between arbitration and FDI remains largely unexplored and its effects unknown. This paper fills this gap.

This study relates to the extensive academic work on the importance for contract enforcement of the host's domestic courts. Contract enforcement by domestic courts is found to be particularly important for facilitating relationship specific investments (Johnson, McMillan and Woodruff, 2002). Nunn (2007) posits that a country's ability to enforce written contracts is an important determinant of its comparative advantage. This result is based on the insight that improved contract enforcement leads to higher relationship-specific investments which leads to the expansion of sectors in which these investments are particularly important (Nunn, 2007). A more independent judiciary is found to attract FDI to the tertiary sector (Walsh and Yu, 2010), and the effectiveness of contract enforcement is found to affect the location of US companies in China (Du, Lu and Tao, 2008).

This paper extends this literature by considering the role of international commercial arbitration in facilitating FDI. Few papers discuss the interplay between arbitration and

FDI despite the widespread use of arbitration for international investment and trade. Berkowitz, Moenius and Pistor (2006) find that international arbitration plays a role in the types of goods that countries export where countries that have more effective international arbitration regimes are found to export more complex goods. Waglé (2011) finds a positive association between arbitration quality and FDI.

This paper develops a theoretical model to explain the effect of arbitration on FDI. We allow disputes stemming from incomplete contracts to be resolved either by domestic litigation or international arbitration. Arbitration affects FDI through two channels. First, arbitration displaces the Melitz entry productivity frontier, increasing the number of projects or extensive margin (Melitz, 2003). Second, arbitration increases the size of investments or the intensive margin.

To quantify the importance of international arbitration on FDI, this paper evaluates the effect of signing the *Convention on Recognition and Enforcement of Foreign Arbitral Awards* of 1958, New York "NY" Convention henceforth. The NY Convention facilitates the enforcement of arbitral awards, and so underpins international commercial arbitration. Countries which ratify the NY Convention commit to substantially improve their arbitration regime. Therefore, the impact of joining the NY Convention is an appropriate measure of the effect of a positive shock on a country's international arbitration regime.

The contributions of this paper are the following: First, this research provides a theoretical framework to explain how arbitration relates to FDI. Secondly, this paper estimates the effects of arbitration on FDI bilateral flows and the number of investments by means of the gravity equation. Results suggest that increasing the access to international commercial arbitration has a positive effect on FDI. This effect is largely on the intensive margin in that the effect is largely on the volume of investment rather than on the number of projects. This effect is higher in countries with weaker institutions

and for larger projects. Third, the paper explores the FDI diversion that results when a country joins the NY Convention.

The remainder of the paper is organized as follows. Section 2 provides background on international commercial arbitration; Section 3 constructs a theoretical model; Section 4 describes the empirical methodology; section 5 discusses the results; and Section 6 concludes with some implications for policy.

2 Background

Contracts that cross international borders tend to fall under the remit of international commercial arbitration (arbitration henceforth). Disputes adjudicated through arbitration include those arising from distribution agreements, joint ventures, and agreements to provide goods and services (UNCITRAL, 2008). The resolution process is binding, non-judicial, and private. Most arbitration cases arise under an agreement in the original contract to send all contractual disputes to arbitration (Mattli, 2001). The arbitration proceedings tend to be broadly similar to those that would occur in a domestic court. Arbitrations often occur under the rules of an arbitration center. There are centers in many major cities including Paris, Hong Kong, London, Stockholm and Singapore.

Arbitration is reported to be the leading method to adjudicate contractual disputes, and thus enforce contracts, arising from international contracts. It is estimated that 80 percent of private international contracts include clauses that provide for disputes to be sent to arbitration. Indeed, the international business community considers arbitration to be the "normal means of settling disputes arising from international transactions"(Sanders, Schultsz and Berg, 1982, p. 287) and thus "arbitration has achieved world-wide acceptance as the favoured and principal mechanism for resolving disputes

arising out of international transactions" (Lew, Mistelis and Kroll, 2003, v). A survey of MNEs by Mistelis (2004) found that 90 percent of respondents preferred arbitration over cross-border litigation.

Arbitration provides firms with access to a system for adjudicating disputes that is largely similiar irrespective of where the dispute may arise. That said, there are aspects of the arbitration process that depend on the domestic legal system. Notably, the ease with which arbitral awards are enforced depends on the quality of countries arbitration regimes, including domestic laws, and how these are implemented by domestic courts. Many countries enforce arbitral awards as a matter of course. As a result, the International Arbitration Survey (PwC, 2013) finds that the majority of arbitral awards are paid out voluntarily through a settlement and therefore do not ultimately require enforcement proceedings in domestic courts. Firms' willingness to voluntarily comply with an award is partly due to the low likelihood that domestic courts in many jurisdictions will deny enforcement of the award. A leading arbitration center, the International Chamber of Commerce (ICC) in Paris reports that only 6 percent of all ICC awards have been challenged in domestic courts, with only 0.5 percent of awards set aside (Mattli, 2001). However, there are countries whose arbitration regimes are not supportive of international commercial arbitration. Indeed, the World Bank's Investment Across Borders study finds substantial variation in the quality of countries arbitration regimes[1]. Furthermore, the International Arbitration Survey reported that in five percent of cases, parties settled the arbitration due to concerns that it would be difficult to enforce an arbitration award. The reasons that respondents expected to face difficulties implementing international arbitration awards included hosmtility from domestic courts towards foreign awards, a lack of understanding amongst the local judiciary as to how arbitration works, and the perceived corruption of domestic judges

[1]See World Bank, Investing across Borders: Arbitrating Commercial Disputes (http://iab.worldbank.org/data/exploretopics/arbitrating-commercial-disputes).

and administrative personnel (PwC, 2013).

An important benefit of international commercial arbitration is that it provides more flexibility than domestic courts. The parties can determine the number of arbitrators on the tribunal, the procedure for selecting arbitrators, the place of arbitration, the applicable law, and the tribunal's powers. This flexibility extends to arbitration centers. They are able to adjust their rules in response to the needs of firms using their services. These centers are reported to regularly respond to the needs of firms by creating new services and updating their rules (Mattli, 2001). In contrast, a trial in a domestic court follows a specific court's rules which may not be suited to the needs of one or more of the parties. The ability to select the law, the arbitrator and the rules means that international commercial arbitration's rulings can be expected to be more accurate.

The flexibility offered by arbitration allows for the parties to select arbitrators who are specialized in commercial law. It can also "provid[e] for the appointment of industry-expert arbitrators, who can make many factual determinations more accurately . . . than a judge or jury" (Bernstein, 2001). Industry-expert arbitrators arbitrate by themselves or they can join an arbitration panel that includes lawyers (Onyema, 2005). There are likely to be substantial benefits from being able to use specialized adjudicators as opposed to relying on generalist domestic courts. For example, in patent law the use of specialized adjudicators has been found to lead to more uniformity, expertise and predictability in judicial findings (Gallini, 2002), and in antitrust law there are indications that generalist judges cannot effectively evaluate economic evidence (Baye and Wright, 2011).

A related benefit of arbitration is that it facilitates parties' choice over the law under which the contract is heard[2]. The majority of arbitrations reference English or New

[2]Arbitration facilitates the choice of law by allowing the parties to choose an arbitrator familiar with the law governing the underlying contract. Therefore, if a contract between a German and Venezuelan companies is governed by English contract law the parties can select an arbitrator familiar with this body of law. Parties can select to have English law govern a contract and have this enforced

York State law School of International Arbitration (2010). These are common law jurisdictions with established bodies of precedent. This precedent should provide greater predictability as to the outcomes of arbitrations over commercial disputes(Landes and Posner, 1976). Another attribute of arbitration is that the proceedings, and the award itself, can be kept confidential and so the parties can avoid the reputational costs of public hearings, as well as the possible release of commercially sensitive information (Mattli, 2001). In addition, the use of arbitration reduces the extent to which either company has a home court advantage (Bhattacharya, Galpin and Haslem, 2007).

A further advantage of arbitration is that the cost of engaging in nuisance suits is substantial because arbitrations tend to use the English system where the losing side pays all, or a proportion, of the winning sides costs (Anjomshoaa, 2007). In contrast, parties are more likely to take poor quality cases to court when domestic courts use the American system. In this system both parties bear their own costs of litigation. The American system provides companies with a low probability of winning an incentive to litigate purely in the hope that the other side will pay them out through a settlement, where the other side may well do this to avoid bearing further legal costs from extended litigation (Rosenberg and Shavell, 1985).

Using arbitration to adjudicate disputes tends to be more expensive than using domestic courts which are the main alternative for formally enforcing contracts [3]. Mistelis' (2004) survey of MNEs that found that respondents preferred arbitration, also found that the main disadvantages of arbitration are its high costs and lengthy proceedings. This result is supported by the lawyers responsible for litigation costs at GE Oil and

in a domestic court. In this example, they would then have the contract dispute heard in a German or Venezuelan court. However, if they were to do this, the judge is highly unlikely to know English contract law sufficiently well to judge the case effectively. And so, the parties would largely lose the benefits of using English contract law.

[3]Arbitration can be conducted relatively cheaply for certain disputes such as those related to the delivery of goods. These disputes can often be resolved through online dispute resolution systems. For example, in the cotton industry disputes are often adjudicated for around a thousand dollars (Bernstein, 2001).

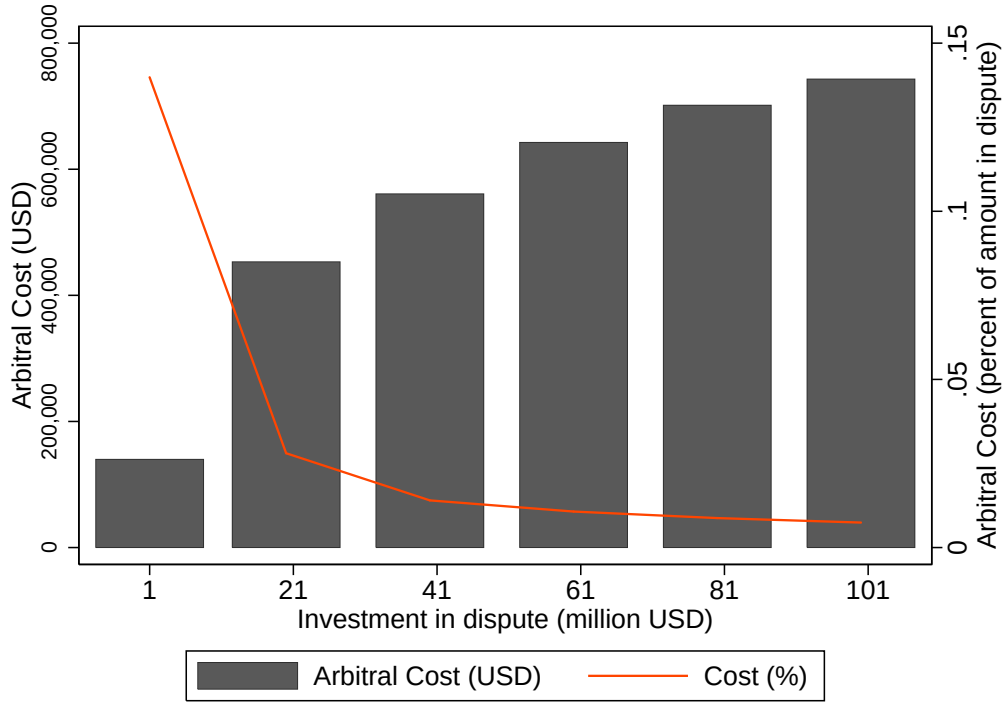
Gas. This is a division of GE that sells equipment and services to the oil and gas industry and has around 44 thousand employees and 19 billion dollars in revenues. The division enters into hundreds of thousands of purchase and sales contracts of vastly different sizes and equipment types across most countries in the world. The value of these contracts range from a few hundred dollars up to as much as half a billion. This division has found that arbitration is substantially more expensive than the cost of litigating in most domestic courts. For example, the in-house lawyers noted that in most civil law and developing countries, routine commercial disputes seldom cost more than 30 thousand dollar to resolve in the courts[4]. The division's in-house lawyers have found that, by contrast, resolving the same disputes by either domestic or international arbitration are likely to cost from five to thirty times as much, depending on how the cases are resourced and the nature and complexity of the dispute. The lawyers noted that while arbitration may not be more expensive than litigating disputes in the few higher income, common law, countries — namely the USA, UK, Australia and Hong Kong — current arbitration practice is not likely to be substantially cheaper. [5]

Because of the high cost of arbitration, commentators such as Casella (1996) suggest that parties tend to only use arbitration for disputes over larger amounts This higher cost of arbitration arises from a number of factors. The parties often need to pay for lawyers and witnesses to travel to hearings in a third country which tends to increase the costs of arbitration above the cost of a case of comparable length and complexity in a domestic court. Disputes over contracts that reference New York or English law tend use lawyers specialized in this law who are typically located in New York or London

[4]This figure is the cost for routine commercial disputes. For particularly large and complex disputes parties can, and do, spend more in domestic courts than this

[5]Lawyers in the legal department of GE Oil and Gas noted that cost is rarely the only item that drives a preference for one forum or the other. In most cases, the company's preference for arbitration will be driven by considerations of the quality of dispute resolution that can be obtained through the available fora, especially with regard to predictability and neutrality. This view is consistent with the findings of the theoretical model discussed later in the paper.

Figure 1: Arbitral costs



Source: ICC arbitral cost calculator

which are two of the most expensive legal markets (The Economist, 2014). A further cost is that in contrast domestic courts, parties need to pay for the arbitrators's fees as well as various administrative expenses. For example, the fees charged for arbitrations at the ICC can exceed the total cost of routine contract disputes in many countries' domestic courts. The ICC estimates that its fees, and those of the arbitrators, will be around 60 thousand dollars on a 300,000 dollar claim. These fees are in addition to other expenditures such as those on lawyers, experts, and travel. The fees increase less than proportionately with the value of the claim as can be see in Figure 1 below[6]. For instance, for a 100 million dollar dispute the ICC expects that fees will come to more than 700 thousand dollars.

[6]These figures are based on figures from the International Chamber of Commerce's website [http://www.iccwbo.org/products-and-services/arbitration-and-adr/arbitration/cost-and-payment/cost-calculator/]

The legal cornerstone of arbitration is the NY Convention. The NY Convention requires signatories to recognize and enforce awards made in international arbitration proceedings unless certain, relatively restrictive conditions are met. Joining the convention thus facilitates access to cross border arbitration. By facilitating the enforcement of arbitration awards the NY Convention underpins the use of international commercial arbitration. Indeed, large scale use of arbitration is largely traced to the establishment of the NY Convention in the late 1950s (Casella, 1996). There is no comparable treaty to the NY Convention for decisions made by domestic courts, which makes it difficult to enforce awards made by domestic courts in foreign jurisdictions[7]. This makes it difficult to use domestic courts against MNEs whose assets are located in other countries.

The importance of the NY Convention suggests that joining it may well increase FDI flows into a country. The data in Figure 2 is consistent with this hypothesis. It shows UNCTAD data on net FDI inflows for a balanced panel of those countries that joined the NY Convention in the period from 1975 to 2003. FDI is higher in the years after joining the NY Convention. In the four years prior to signing the NY Convention the growth in average FDI inflows is just over 2 percent. The growth is 10 percent for the four years after joining the NY Convention and 11 percent for the full eight years after joining the NY Convention.

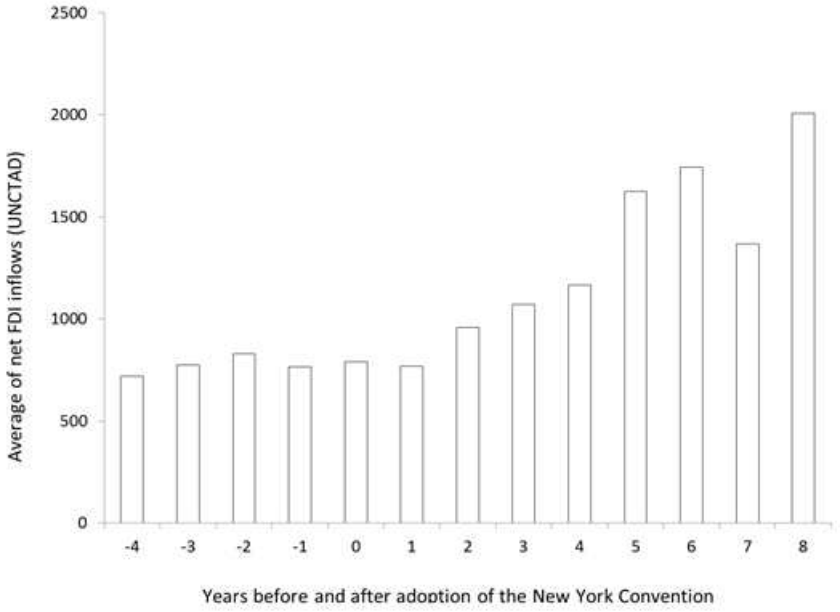
In light of this discussion the next section presents a model which explains the effect of arbitration on FDI.

3 Theoretical framework

In the model, global firms invest abroad and establish contracts with local suppliers (Antràs and Helpman, 2004; Van Assche and Schwartz, 2013). There is a potential for

[7]There are certain regional initiatives such as in the European Union which allow decisions to be enforced in other countries in the region.

Figure 2: FDI Inflows before and after a country joins the NY Convention



the parties to engage in ex-post expropriation of the other party through rent seeking litigation. They have two ways to resolve the resulting disputes: through domestic courts or arbitration. The model shows the impact on the size and number of investments when parties gain access to the use of arbitration.

The setup starts with a MNE from the home country (i) that invests in a host country (j) in sector z and produce variety b. The home and the host country are populated by a unit measure of consumers with identical preferences:

$$U = v_0 + \frac{1}{\mu} \sum_{z=1}^{Z} V_z^{\mu}, \tag{1}$$

where v_0 is the consumption of a homogenous good and aggregate consumption is represented by index V in sector z with parameter $\mu \in (0, 1)$ Aggregate consumption

in the sector is a function of the different varieties produced, $v_z(b)$ is defined as:

$$V_z = [\int v(b)^{\alpha} \ db]^{1/\alpha}, \tag{2}$$

where the elasticity of substitution is $1/(1-\alpha)$, with $\alpha > \mu$, and so goods within the sector are more substitutable with each other than with goods from another sector.The MNE (m) faces an iso-elastic demand curve for its output q of variety b in sector z. This is described by the inverse demand curve:

$$p_b = V_z^{\mu-\alpha} q_b^{\alpha-1}. \tag{3}$$

The production of q requires two complementary inputs; foreign capital inputs k that are only produced by MNEs from the home country, and inputs x that are only produced by local suppliers (s) in the host country. Thus both parties need to enter into a contract in order to produce end good q. MNEs produce k one period prior to production. Final good q is produced using a Cobb-Douglas production function:

$$q(b) = \theta \left(\left(\frac{k(b)}{\eta} \right)^{\eta} \left(\frac{x(b)}{1-\eta} \right)^{1-\eta} \right)^{\sigma}, \tag{4}$$

where $\eta \in (0,1)$ is a sector wide parameter that describes the intensity with which k is used in the production of q, σ is a parameter for economies of scale in the sector, it is less than one in sectors that have decreasing returns to scale, when it is equal to one there are constant returns to scale and when it is more than one there are increasing returns to scale; θ is a firm specific productivity parameter. Combining equations (3) and (4) we see that the MNE generates revenues for one period of

$$R(b) = V^{\mu-\alpha} \theta^{\alpha} \left(\left(\frac{k(b)}{\eta} \right)^{\sigma\alpha\eta} \left(\frac{x(b)}{1-\eta} \right)^{\sigma\alpha(1-\eta)} \right). \tag{5}$$

When the MNE enters the market it receives a signal describing its level of productivity (Helpman et al., 2004; Melitz, 2003). If it decides to invest, there are fixed costs of production for the MNE of f_m^p and for the supplier of f_s^p. For simplicity, from now on we suppress the sectoral reference b.

The MNE and the domestic supplier either resolve their disputes through international arbitration (A), or through the host's domestic courts (D). The choise of forum for resolving disputes affects the upfront fixed costs of the investment, and the variable cost of rent seeking litigation (as discussed below). The firm treats all non-rent seeking legal expenses as a fixed cost. This can be thought of as a retainer or insurance payment. To reflect the higher cost of arbitration there are additional fixed legal costs for both firms (f_m^A and f_s^A) when disputes arising from the contract are resolved through arbitration.

The rent seeking litigation occurs after the revenue has been generated. At this point both parties engage in rent seeking litigation actions to capture a proportion of revenues r_a^Q where $a \in [m, s]$, $Q \in [D(j), A]$ and $r_a^Q \geq 0$. These actions could include expenditure on litigation, informal approaches such as the lobbying the courts, or even bribery (Antràs and Helpman, 2004; Van Assche and Schwartz, 2013). It is assumed that capturing larger amounts of revenue becomes more difficult. This is reflected in the convex cost function $L\left(r_a^Q\right)$ for gaining a percentage of the project's revenue through rent seeking r_a^Q:

$$L(r_a^Q) = e^{\frac{r_a^Q}{y^Q(\rho^Q, l^Q)}}. \tag{6}$$

The parameter $y^Q\left(\rho^Q, l^Q\right)$ captures how open the legal system is to rent seeking actions. A legal system that is more open to rent seeking has a higher y^Q. The legal system operates equally on both parties (y^Q is the same for both parties), and its effectiveness is a function of ρ^Q (the likelihood that rent seeking litigation will be successful) and l^Q (a measure of the variable costs entailed in rent seeking actions). Legal systems are

more open to rent seeking when rent seeking litigation is more likely to be successful (a higher ρ^Q), and lower variable costs (a lower l^Q) . In contrast, when courts or tribunals more accurately distinguish rent seeking actions, and the costs of these actions is higher, y^Q is lower. As discussed in the background section it can be expected that arbitration proceedings will be more effective at inhibiting rent seeking actions than domestic courts ($y^{D(j)} > y^A$), for reasons that include the ability to choose the law under which the contract is written, the flexibility in selecting procedures and arbitrators and the higher variable cost of litigation actions when arbitration is used. While the effectiveness of legal systems is assumed to vary across countries, it is assumed that the effectiveness of arbitration is the same across countries as long as the country has adopted the NY Convention[8].

The model is solved in four stages using backward induction. In the first stage the MNE has a once-off opportunity to enter the market and observe its level of productivity θ. It decides whether to resolve disputes through arbitration or the domestic courts, and whether to enter into production or not. In the second stage the MNE offers the supplier a take it or leave it contract. In the third stage the MNE produces k units one period before the supplier produces x where the level of k is not observed by the supplier until after it produces x. In the fourth stage firms decide on the deviation from the contract and the share of revenue that they aim to achieve from rent seeking. This provides a basis for describing the impact of joining the NY Convention on FDI. This leads to a number of predictions that are tested in the empirical section.

[8]The assumption that effectiveness of arbitration is the same across countries is a simplification. This simplification is consistent with the notion that adjudication under arbitration is largely the same across countries, and most arbitration awards are settled. However, as discussed in the background section aspects of the domestic legal system do impact on the effectiveness of arbitration. This suggests that the effectiveness of arbitration will be positively correlated to some extent with domestic legal institutions.

3.1 Contract enforcement through arbitration

In the fourth stage of the game the MNE and the local supplier engage in rent seeking activities that aim to claim revenues from the other party. These claims can exceed the value of the revenues generated by the project. This presumes that they are able to make claims against assets outside of the project. They treat the revenue from the investment as fixed, and non-cooperatively select the level of r_a^Q that solves:

$$\max_{r_m} \pi_m = \left(1 + r_m^Q - r_s^Q\right) R - L\left(r_m^Q\right) \tag{7a}$$

$$\max_{r_s} \pi_s = \left(r_s^Q - r_m^Q\right) R - L(r_s^Q) \tag{7b}$$

The solution to these problems yields:

$$r_a^{Q*} = y^Q \ln\left(y^Q R\right) \tag{8a}$$

$$L(r_a^{Q*}) = y^Q R. \tag{8b}$$

The resulting r_a^{Q*} is equal for both parties, and so they offset each other, with the result that neither party successfully achieves an increase in revenues. However, both parties end up spending $y^Q R$ on rent seeking actions. In the third stage, the firm starts earning revenue π.

In the second stage of the game the MNE offers a take it or leave it contract to the supplier. Each unit of k has unit cost *c(1+r)* where c is the cost of production, and *(1+r)* reflects MNEs cost of capital. Local firms produce x for immediate use. Each x has unit cost *w,* where w reflects local wage rates. The contract offered to the supplier maximizes the MNE's profits subject to the supplier's participation constraint. The MNE has an incentive to set the payment to the supplier at the lowest level that still

satisfies the participation constraint to ensure that $\pi_s = 0$. This allows us to calculate that the MNE's investment generates operating profit of:

$$\pi_m^Q = \left(1 - 2y^Q\right)^{\frac{1}{1-\sigma\alpha}} \frac{V^{\frac{1-\alpha}{1-\sigma\alpha}} \theta^{\frac{\alpha}{1-\alpha\sigma}} (1-\sigma\alpha)}{\left(\frac{1}{\sigma\alpha}\left(c\left(1+r\right)\right)^{\eta}\left(w\right)^{(1-\eta)}\right)^{\frac{\sigma\alpha}{1-\sigma\alpha}}} - (f_m^Q + f_s^Q), \tag{9}$$

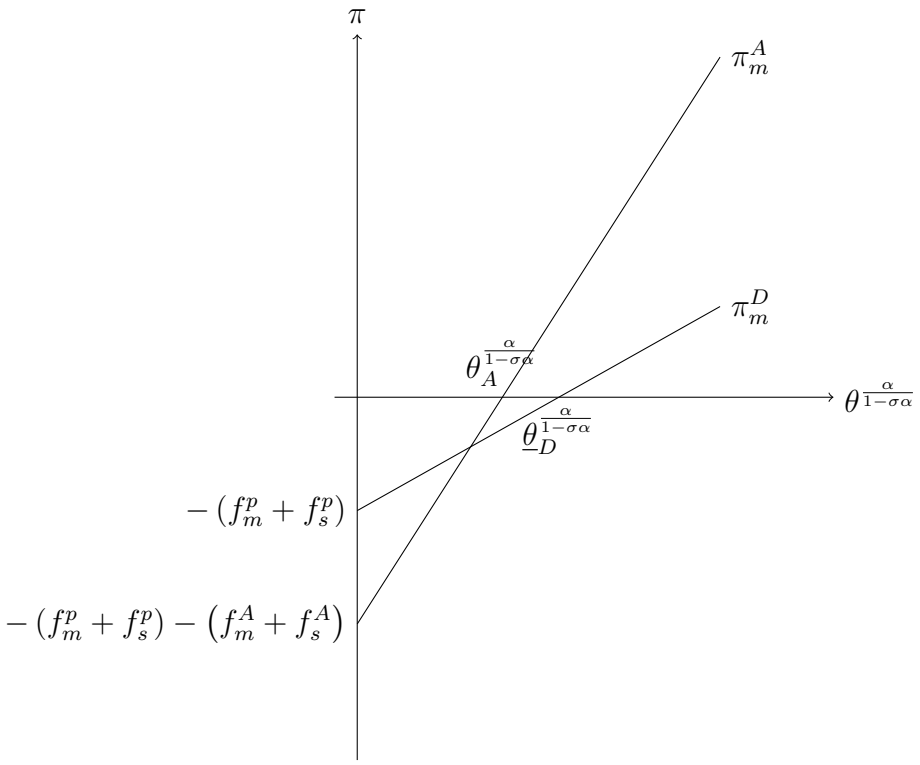
where the fixed costs under either arbitration or domestic courts are referenced as f_m^Q. The term $\left(1 - 2y^Q\right)$ shows that the MNE's profits are reduced by its own rent seeking activities, as well as those of its supplier. The reason for this is that the MNE has to compensate the supplier for its costs of rent seeking to induce the supplier to enter into the contract in the first place. The superscript $(1/(1-\sigma\alpha))$ suggests that the impact on profitability of rent seeking litigation is accentuated in more competitive sectors with more consumer substitution (higher α) , and the effect is accentuated by the presence of economies of scale (larger σ).

3.2 The effect of international commercial arbitration

In selecting to use arbitration or domestic courts to adjudicate its contract with the domestic supplier the MNE faces a trade-off because (i) arbitration is more effective at inhibiting rent seeking litigation actions, but (ii) entails higher fixed legal costs. This is illustrated in Figure 3 which shows firms profitability when they use arbitration or domestic courts.

Figure 3 shows how the benefit of access to international commercial arbitration will vary with the MNE's productivity (θ). The profitability of the investment is shown on the vertical axis, and productivity $\theta^{\frac{\alpha}{1-\sigma\alpha}}$ on the y-axis. Operating profit given the use of arbitration (π_m^A) or the domestic courts ($\pi_m^{D(j)}$) is linearly increasing in $\theta^{\frac{\alpha}{1-\sigma\alpha}}$. The intercept of π_m^A is lower than $\pi_m^{D(j)}$ by the additional fixed costs of using arbitration $(f_m^A + f_s^A)$. However, the slope of π_m^A is steeper than π_m^D because arbitration leads to

Figure 3: Firms profitability from arbitration and domestic courts



a smaller proportion of revenue being spent on rent seeking ($y^A < y^{D(j)}$). The crossing point between π_m^A and $\pi_m^{D(j)}$ determines which project companies will select to use arbitration rather than domestic courts. These will tend to be higher productivity projects, and so larger investments.

3.2.1 Effect of enforcing arbitration

Enforcing arbitration (e.g., joining the NY Convention) gives firms effective access to arbitration to adjudicate contractual disputes, and so access to more effective contract enforcement. As illustrated by Figure 3, the benefit of this access will vary with the MNE's productivity (θ). Given a uniform distribution for $\theta \in [0, \bar{\theta}]$, we can evaluate the impact of joining the NY Convention on the size and number of investment in the sector. As shown in Figure 3, the model suggests that enforcing arbitral mechanisms

increases the number of investments in the sector by reducing the minimum productivity threshold at which the MNE invests ($\underline{\theta}_{D(j)} > \underline{\theta}_A$). The resulting percentage change in the number of investments is:

$$\%\triangle Q_k = \begin{cases} \dfrac{\underline{\theta}_{D(j)}\left(1-\left(\left(\frac{(f_m^p+f_s^p)+(f_m^A+f_s^A)}{f_m^p+f_s^p}\right)^{\frac{1-\sigma\alpha}{\alpha}}\left(\frac{1-2y^{D(j)}}{1-2y^A}\right)^{1/\alpha}\right)\underline{\theta}_{D(j)}\right)}{\left(1-\underline{\theta}_{D(j)}\right)} - 1, & \text{if } \underline{\theta}_A \leq \underline{\theta}_{D(j)} \\ 0, & \text{otherwise} \end{cases}, \tag{10}$$

The increase in the number of projects from having access to arbitration is the result of two offsetting effects. Higher fixed costs from using arbitration increase the threshold $\left(\frac{(f_m^p+f_s^p)+(f_m^A+f_s^A)}{(f_m^p+f_s^p)}\right)$, and thus reduce the increase in the number of investments from joining the convention. This is offset by a reduction in the minimum threshold from reduced rent seeking ($\left(\frac{1-2y^{D(j)}}{1-2y^A}\right) < 1$) because arbitration is more effective than the domestic courts at inhibiting rent seeking.

The change in the volume of investments (K) in the range where $\underline{\theta}_A \leq \underline{\theta}_{D(j)}$ is:

$$\%\triangle K = \left(\left(\frac{1-2y^A}{1-2y^{D(j)}}\right)^{\frac{1}{1-\sigma\alpha}} \times \int_{\underline{\theta}_A}^{\overline{\theta}} \theta^{\frac{\alpha}{1-\sigma\alpha}} d\theta\right). \tag{11}$$

Equations (10) and (11) are used to derive a number of predictions which are tested in the empirical section. In equations (10) and (11), the increase in investment from being able to use arbitration is driven by the ratio of $(1-2y^{D(j)})$ to $(1-2y^A)$. This ratio is likely to be greater than one due to the benefits of arbitration discussed before. This suggests that arbitration could increase the volume of investment and the number of investment deals made. Whether the benefits of arbitration translate into increased investment will depend on whether firms have an incentive to adopt arbitration, something that cannot be taken for granted given the high cost of using arbitration.

While arbitration is expensive, the discussion in the background section suggests

that many MNEs do have an incentive to use arbitration despite its high cost. With this in mind, equations (10) and (11) suggest that access to arbitration should lead to an increase in the number and volume of investments (prediction 1 below). The ratio of $(1 - 2y^{D(j)})$ *to* $(1 - 2y^{A})$ will be greater in countries whose domestic legal regimes are less effective at inhibiting rent seeking because less effective institutions would correspond to a lower value for $1 - 2y^{D(j)}$ and so a higher ratio.This suggests that the impact of access to arbitration will be larger in countries with weaker institutions (prediction 2 below). The effect of a larger ratio $(1-2y^{D(j)})$ *to* $(1-2y^{A})$ is accentuated by more intense competitive pressure (higher α), and greater scale economies (larger σ). Equation (10) considered in light of equation (11) indicates that the impact of arbitration on the volume of investments could be quite different to its impact on the number of investments. In order for access to arbitration to affect the number of investments (equation 10) it must reduce the minimum productivity threshold at which firms are willing to invest. This would suggest almost universal adoption of arbitration. In contrast, arbitration can increase the volume of investments (equation 11) even if only a minority of firms adopt arbitration. This suggests that it is quite plausible that there would be a larger increase in the volume of investments than in the quantity of investments (prediction 3 below).

To summarize, the theoretical discussion thus leads to three main predictions:

1. Commitment to the NY Convention should lead to an increase in investment by MNEs,

2. the increase in investment and projects will be greater for countries with weaker institutions, and

3. the effect of arbitration on the volume of investments will be greater than its impact on the number of investments

Table 1: Variable Dictionary and Summary Statistics

Variable	Description	Units/Type	mean	sd	min	max
FDI_{ijt}	Foreign Direct investment (volume)	Constant 2005 USD	125.24	690.76	0	33094.14
N_{ijt}	Extensive margin (projects)	Integer (project count)	1.96	11.9	0	920
$\ln(Y_{it} \cdot Y_{jt})$	Gross Domestic Products	Constant 2005 USD	24.35	2.45	12.36	32.94
FTA_{ijt}	Free Trade Agreement	Dummy	0.27	0.44	0	1
BIT_{ijt}	Bilateral Investment treaty	Dummy	0.42	0.49	0	1
NYC_{jit}	New York Convention (both)	Dummy	0.82	0.38	0	1
$NYC1_t$	New York Convention (one)	Dummy	0.98	0.10	0	1
NYC_{it}	New York Convention (source)	Dummy	0.96	0.19	0	1
NYC_{jt}	New York Convention (host)	Dummy	0.88	0.31	0	1
$rights_{it}$	Legal Rights index (source)	Index	6.36	2.49	0	10
$rights_{jt}$	Legal Rights index (host)	Index	5.62	2.61	0	10

We test these predictions in the next section.

4 Empirical methodology

The predictions from the theoretical section are tested on a country pair by year panel using the gravity equation. The gravity equation is the empirical workhorse for analyzing bilateral flows. The gravity equation is widely used in international economics and explains a variety of factor movements, such as FDI, financial equities, migration, tourism, employment or commodity flows (Anderson, 2011; Bergstrand and Egger, 2011; Griffith, 2007; Paniagua and Sapena, 2015). Since Anderson (1979), the gravity model gravity model for international trade is fully grounded in theory. The theoretical foundations of the gravity model for FDI are more recent (Bergstrand and Egger, 2007; Kleinert and Toubal, 2010). Below we describe our approach to treat the major empirical gravity caveats, namely omitted variable bias, self-selection bias, endogeneity and firm heterogeneity.

Summary statistics of the variables and dictionary for the variable names are shown in Table 1. Detailed data sources, description and countries in the analysis are shown in the Data Description.

4.1 Gravity equation for a country pair dynamic panel

The gravity model from the pre-panel data cross-section era of FDI relates bilateral trade flows (in logs) to economic size (GDP), distance and other factors affecting FDI barriers. However,theoretical developments of the gravity equation since Tinbergen's (1962) initial formulation for international trade show that that the benchmark equation is miss-specified due to the omission of fixed effects terms. In a country-pair dynamic panel all the time invariant country-pair variables (e.g., distance, border, colony, common language, same country, religion and landlocked) are controlled by country-pair fixed effects (CPFE). The advantage of this specification is that the CPFE dummies take care of any unobserved constant heterogeneity at the country-pair level. Therefore, our country-pair per year panel specification is the following augmented gravity equation:

$$FDI_{ijt} = exp\left(\begin{array}{c} \beta_1 \ln\left(Y_{it} * Y_{jt}\right) + \beta_2 BIT_{ijt} + \beta_3 FTA_{ijt} \\ \beta_4 NYC_{ijt} + \beta_5 NYC1_{ijt} \\ +\lambda_{ij} + \lambda_{i,3t} + \lambda_{j,3t} + \lambda_t \end{array}\right) + e_{ijt}, \tag{12}$$

where FDI_{ijt} is the aggregate investment between home country i and host j in year t. The equation controls for market demand through the variable Y, which denotes the domestic gross product (GDP). To measure the applicable legal regime, BIT (Bilateral Investment Treaty) is a dummy that takes a value of one if the country pair has a bilateral investment treaty in force; FTA (Free Trade Agreement) is a dummy that indicates if both countries have a free trade agreement in force. The variable e_{ijt} represent a stochastic error term (clustered by country-pair).

Our variables of interest indicate whether a country has ratified the NY Convention. The variable NYC_{ijt} equals 1 if both countries in the pair have done so in or before a particular year, and equals 0 otherwise. The variable $NYC1_{ijt} = \max(NYC_{it}, NYC_{jt})$

equals one if only one country in the pair is a signatory. With this measurement, we are able to identify a differential impact depending on whether both or just one of the partner countries in a pair were members of the agreement. Particularly, a negative coefficient associated to $NYC1_{ijt}$ would indicate the diversion of FDI from outsiders to insiders of the NY Convention.

4.2 Fixed effects

The empirical equation (12) includes a full set of fixed effects (λ). Since Anderson and Van Wincoop's (2003) seminal solution to McCallum's (1995) border puzzle, country fixed effects (CFE) are standard in all gravity specifications, including gravity estimates of bilateral FDI (Anderson, 2011). For trade, CFE capture multilateral resistance or the sellers' incidence of trade costs from origin i and the buyers' incidence from destination j. The key insight behind multilateral resistance is that all bilateral trade costs in the world contribute to the bilateral trade between country pairs. This effect might otherwise be picked up by other variables in the equation, like the a border dummy.

Country characteristics, however, may vary over time. Therefore, multilateral resistance terms should capture country time-varying factors in a panel setting and similar studies include the interaction of year (or group of years) and CFE dummies (Bergstrand and Egger, 2007). The specialized literature refers to these estimates as country-year fixed effects (CYFE) and we use the variables $\lambda_{i,3t}$ and $\lambda_{j,3t}$ for source and destination CYFE respectively. We interact countries and years in three groups: 2003-2005, 2006-2008 and 2009-2012. This grouping assumes parsimonious country dynamic characteristics that reduce harmful collinearity among dummy variables. Additionally, we control for the trade collapse in 2009. Moreover, we control any common trend in world's FDI with time dummies represented by λ_t. These fixed effects, however, do not

eliminate completely the unobserved bilateral heterogeneity owning to ignoring other dyadic variables that might affect bilateral FDI. That is, the CYFE do not eliminate completely omitted variable bias. Recognizing this, researchers supplement dynamic gravity panels with CPFE represented by λ_{ij} in (12).

4.3 Zeros

For many country pairs there is no bilateral investment occurring in one or both directions, these zeroes bias log-linear ordinary least squares (OLS) estimates of the baseline gravity equation. Furthermore, heterogeneous firms decide to invest abroad depending on their relative productivity (Helpman, Melitz and Yeaple, 2004). Zeros show which firms surpass the FDI productivity threshold and so contain information on firm heterogeneity (Anderson, 2011). Hence, OLS estimates incur in self-selection bias, as the sample considers only the most productive firms (or countries) in a certain year. The literature has recently addressed how to treat zeros appropriately, but not without discrepancies (Helpman, Melitz and Rubinstein, 2008; Silva and Tenreyro, 2006).

To overcome firm or country selection bias due to zeros in the dataset, we follow similar empirical studies (e.g., Kleinert and Toubal, 2010) and adopt the non-linear variant of the FDI gravity equation. In particular, we use the Pseudo-Poisson Maximum likelihood (PPML) estimator proposed by Silva and Tenreyro (2006). PPML offers several advantages over other non-linear estimators. First, it offers consistent estimates with zeros since this estimator does not require a log-linearization of the variables. Second, it is robust to heteroskadicity in the error term. Third, it assures convergence of the maximum likelihood estimation via a previous inspection of the data[9]. Additionally, Baltagi, Egger and Pfaffermayr (2014) argue that the PPML estimator is appropriate for panel gravity data with a large number of country pairs and a small number of

[9]With the drawback of dropping observations

country periods.

4.4 Endogeneity

One of the main concerns regarding the estimation of FDI bilateral data is the endogeneity bias (Aisbett, 2009; Bergstrand and Egger, 2013). Following the reasoning behind the endogeneity of FTA in bilateral trade (Baier, Bergstrand and Mariutto, 2014; Baier and Bergstrand, 2009), agreements which promote FDI (e.g., economic integration agreements, BITs and the NY Convention) might be governed by similar underlying determinants as FDI. Therefore, gravity estimates of impact of arbitration on FDI might be biased.

To mitigate the effect of the endogeneity of joining the NY Convention we adopt a Generalized Method of Moments (GMM) estimator. GMM performs two simultaneous equations, one in levels with lagged first differences of the dependent variable as instrument, and one in first differences with lagged levels of the independent variables as instruments. In particular, we use the system-GMM, which is appropriate for linear dynamic panel-data CPFE models (Arellano and Bond, 1991). Busse, Königer and Nunnenkamp (2010a) remark on an additional benefit of the system GMM estimator over other techniques (e.g., lagging the endogenous variable by one period): GMM takes care of the other potentially endogenous variables in our equation, in particular BIT.

4.5 Quantiles

Quantile regression is suited to solve the bias owed firm heterogeneity. This is specially relevant in our context due to the high costs of arbitration. Our previous discussion highlighted that arbitration is costly and therefore convenient for larger FDI projects. Consequently, the estimates of NY Convention might be biased towards the higher levels of FDI. It is therefore suited to inspect the possibility that international

arbitration has a differential impact on different sizes of FDI projects. Quantile regression is popular to interpret results of skewed data like international trade (Baltagi and Egger, 2016) and FDI (Paniagua, Figueiredo and Sapena, 2015).

Standard linear regression techniques summarize the average relationship between a set of regressors and the outcome variable based on the conditional mean function $E(y|x)$, assumed to be normal and symmetrically distributed. This provides a biased view of the relationship, especially when most of the data is concentrated at different points in the conditional distribution of the dependent variable. Quantile regression provides that capability (Koenker and Bassett Jr, 1978). We follow Baker's (2014) procedure to fit a censored quantile regression model. This procedure is appropriate for our purpose, since it is compatible with zeros and country fixed effects.

5 Results and discussion

Overall, the results from the regression analysis suggest that joining the NY Convention has a positive effect on FDI. This result is reasonably robust to the selection of different specifications and the inclusion of control variables[10].

5.1 Investment volumes

The estimation begins in column 1 of Table 2 with the analysis of the impact of the NY Convention on aggregate FDI flows with the baseline gravity specification (12) (with a full set of country-year and country-pair fixed effects). The gravity equation performs well in explaining more than 60% of the variation in bilateral FDI flows. Focusing on our

[10]In the online Appendix, we perform additional robustness tests. In particular, we reduce the number of fixed effects in the regression and use the usual time-invariant gravity control variables (distance, border, colony, common language, same-country, religion and landlocked) instead. The results obtained do not deviate significantly from the structural panel estimation. Additionally, with this specification, we are able to estimate independent home and host effects of arbitration on FDI.

Table 2: Results (FDI)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	CY&CP FE PPML	CY&CP FE PPML	CY&CP FE PPML	CY&CP FE PPML	CY&CP FE PPML	CP FE PPML	CP FE PPML
$\ln(Y_{it} \cdot Y_{jt})$	-0.011	-0.799	-0.043	-0.040	0.613**	-0.120	0.010
	(0.36)	(0.65)	(0.22)	(0.25)	(0.29)	(0.24)	(0.26)
FTA_{ijt}	0.207	-0.008	0.417***	0.459***	0.121	0.329***	0.240**
	(0.13)	(0.25)	(0.15)	(0.15)	(0.19)	(0.11)	(0.12)
BIT_{ijt}	-0.516***	0.092	-0.430**	-0.335	-0.464	-0.448**	-0.382*
	(0.16)	(0.31)	(0.21)	(0.25)	(0.35)	(0.20)	(0.20)
NYC_{ijt}	0.984*	1.750**	-0.461	0.091	1.826***		
	(0.59)	(0.86)	(0.79)	(0.60)	(0.67)		
$NYC1_{ijt}$	1.395*	3.024***					
	(0.74)	(0.99)					
NYC_{ijt-1}			0.608*				
			(0.32)				
NYC_{ijt-2}				0.681***			
				(0.24)			
NYC_{ijt-4}					0.099		
					(0.22)		
NYC_{it}						0.502	1.171
						(0.49)	(1.40)
NYC_{jt}						0.534**	2.075***
						(0.25)	(0.46)
$rights_{it}$							0.254
							(0.33)
$rights_{jt}$							0.388***
							(0.08)
$rights_{it} * NYC_{it}$							-0.184
							(0.37)
$rights_{jt} * NYC_{jt}$							-0.424***
							(0.08)
$\ln(D_{ij}) * NYC_{it}$							0.487
							(0.37)
$\ln(D_{ij}) * NYC_{jt}$							-0.133
							(0.38)
Dep Variable	FDI	FDIpc	FDI	FDI	FDI	FDI	FDI
Observations	38279	37774	33618	29157	19558	39263	34630
R^2	0.625	0.357	0.624	0.642	0.701	-	-
Country(3year) FE*	Yes	Yes	Yes	Yes	Yes		
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country pair FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses (clustered by country pair)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The dependent variable in in column 2 is FDI per capita and includes GDP per capita

variables of interest, we find a positive (0.984) and statistically significant coefficient (to the 10% level) for NYC_{ijt}. On average, bilateral FDI flows are 2.6 times higher when both countries are signatories than otherwise (i.e., when either none are or only one country is a member). The coefficient of $NYC1_{ijt}$is also positive (1.395) and significant, meaning than on average the investment flows of those country-pairs with no members is four times lower than when at least one of the countries is a signatory. The net effect with respect to the base category (country-pairs with no members) is divided into two groups. FDI flows between country-pairs with only one member are 51% higher than with no members[11]. Similarly, FDI flows between country-pairs with two members are 77% higher than with no members in the pair [12]. These results suggest that the positive effect of joining the NY Convention on FDI applies when both countries in the pair are members as well as when one of the countries in the pair is a member. However, the effect is higher when both are members.

Regarding our control variables, the joint evolution of GDPs and trade agreements do not show any significant effect on FDI flows. The counter-intuitive negative sign for BITs may rest on firm heterogeneity and endogeneity biases of our baseline specification, which is treated in subsequent estimates. That said, the negative effect of BITs is consistent with previous findings (Gil-Pareja, Llorca-Vivero and Paniagua, 2013; Tobin and Rose-Ackerman, 2011). Paniagua, Figueiredo and Sapena (2015) argue that the firm heterogeneity bias is responsible for this discrepancy and advocate for the use of quantile regressions to overcome this bias.

Column 2 of Table 2 repeats the same exercise with per capita measures of FDI flows (and GDPs). PPML should be robust to heteroskadicity in the error term. Moreover, weighting FDI by the population product of the country pair reduces the weight of highly populated outliers in the regression. The results confirm the positive effect

[11]Calculated by $(\exp(1.395 - 0.984) - 1) * 100\%$.
[12]Calculated by $(\exp(0.984 - 0.411) - 1) * 100\%$.

of joining the NY Convention on FDI (measure in per capita terms). However, the estimated coefficients appear to overestimate the effect of arbitration on FDI. Furthermore, the R^2 is considerably lower (0.36), suggesting that the gravity equations fit better when estimated in levels rather than using per capita measures.

In columns 3, 4, and 5 we test the time properties of the effect of arbitration on FDI with a lag structure. We add to the contemporaneous effect of NYC_{ijt} a lag of one, two and four years respectively. The lagged variable is positive and significant until four years after the ratification of the NY Convention (i.e., NYC_{ijt-1} in column 3 and NYC_{ijt-2} in column 4 are significant while NYC_{ijt-4} in column 5 is not). This result is consistent with the distributed lag observed in Figure 2.

Although the PPML-CYFE estimation should eliminate most of the gravity biases, the effect of the NY Convention might be absorbing the effect of other variables (e.g., legal rights) at the country level. Furthermore, the specification does not embrace the interaction of arbitration with the countries' legal system nor its effects on FDI's transaction costs, as predicted by the model. However, we cannot directly introduce country fixed variables in our baseline equation due to perfect colinearity with the CYFE. Therefore, to gain some intuition on the effect of arbitration at the country level, we drop CYFE in columns 6 and 7. This allows us to differentiate between host (NYC_{jt}) and source (NYC_{it}) effects[13] and introduce a new set of variables in the two last columns of Table 2.

The variable NYC_{it} equals 1 if the home country has joined in or before a particular year, and equals 0 otherwise. The construction of NYC_{jt} follows the same pattern for the host country. As in Berkowitz, Moenius and Pistor (2006), with this specification we are able to distinguish between source and destination effects of the NY Convention. The variable *rights* measures the quality of the countries' legal institutions. As in

[13]Time-varying country effects like NYC_{jt} are perfectly collinear with CYFE and cannot be included in (12).

Berkowitz, Moenius and Pistor (2006), we interact the rights index with the NY Convention variable. These authors argue that ratifying the NY Convention substitutes for poor domestic institutions and lowers the host's bias against foreigners. Furthermore, our model predicts that arbitration alleviates transaction costs between foreign markets. Thus, we introduce the interaction between distance and NY Convention to measure the differential effect of distance if a country has ratified the NY Convention.

We present in column 5 the results of the effect of arbitration at the country level. We observe in column 5 that the effect of arbitration is positive and significant only when the host country is a signatory. That means (with the precaution of not controlling for multilateral resistance), that host countries may increase their FDI inflows by enhancing arbitral processes.

The results shown in column 6 of Table 2, which include legal rights and distance are in line with economic intuition[14]. Turning our attention towards the variables of interest, we observe that the legal rights index of the host country has a positive effect on bilateral FDI. As expected, the NY Convention reduces this positive effect of the host's institutions on FDI.

The positive and significant effect of the host's domestic legal institutions (0.388) is eliminated completely by the interaction between the NY Convention and legal rights (-0.424). This suggests that investors are less sensitive to local institutions when the host ratified the NY Convention. This implies that the NY Convention, by implication the use of arbitration, could substitute for the host's domestic institutions. And so arbitration may be a useful mechanism for low income countries that exhibit lower levels of judicial quality (Rigobon and Rodrik, 2005). Furthermore, the NY Convention has no significant effect on the impact of distance, a measure of transaction costs.This suggests that the effect of arbitration is at the institutional level rather than at the

[14]For a detailed discussion of the effect of legal rights refer to Paniagua and Sapena (2014)

transaction cost level (e.g. transportation costs). .

5.2 Extensive margin

To evaluate the effect of arbitration on the number of investments, we regress the count of international projects against the same independent variables. The effect on the quantity of investments differs from our previous estimates. Table 3 reports the estimation results. As usual, the gravity equation performs well in explaining 90% of the variation of investment projects. Focusing directly on the variables of interest in column 1, we observe a null effect of the Convention in most regressions. However, omitting the multilateral resistance terms (columns 2 and 3), we do observe a positive effect of arbitration at the country level. Again, we must interpret these estimates with caution due to the known biases. Moreover, the effect of the arbitration on the number of projects is an order of magnitude smaller than on FDI capital flows. The PPML-CFE estimation in column 3 of Table 3 is also significantly lower than for aggregate FDI flows. Similarly, the interaction effect between arbitration and legal rights on projects shown in column 3 of Table 3 is lower than on the number of projects (-0.180 vs. -0.424). These results are consistent with the findings from the theoretical model.

5.3 Quantile Regression

The estimation results are not complete owing to the fact that relative arbitration costs are not captured by the standard gravity equation. The background section found that arbitration entails substantial costs, and so it is plausible that it has a different effect on smaller investments. Further, the effect of arbitration is expected to be greater when there are economies of scales suggesting larger investments will be more affected. To test for this possibility, we use quantile regression to measure the incidence of arbitration across different levels. Furthermore, quantile regression eliminates the

Table 3: Results (Extensive margin)

	(1)	(2)	(3)
	CY&CP FE PPML	CP FE PPML	CP FE PPML
$\ln(Y_{it} \cdot Y_{jt})$	-0.058	-0.339	-0.159
	(0.17)	(0.30)	(0.25)
FTA_{ijt}	0.183*	0.048	0.0140
	(0.09)	(0.07)	(0.08)
BIT_{ijt}	0.050	0.022	0.023
	(0.06)	(0.12)	(0.11)
NYC_{ijt}	-0.039		
	(0.27)		
$NYC1_{ijt}$	-0.305		
	(0.33)		
NYC_{it}		0.679***	1.039**
		(0.22)	(0.51)
NYC_{jt}		0.454***	1.094***
		(0.10)	(0.251)
$rights_{it}$			0.129
			(0.10)
$rights_{jt}$			0.0839*
			(0.05)
$rights_{it} * NYC_{it}$			-0.116
			(0.10)
$rights_{jt} * NYC_{jt}$			-0.180***
			(0.05)
$\ln(D_{ij}) * NYC_{it}$			0.0981
			(0.18)
$\ln(D_{ij}) * NYC_{jt}$			-0.188
			(0.17)
Observations	38279	39263	34630
R^2	0.911	-	-
Country(3year) FE*	Yes	No	No
Year FE	Yes	Yes	Yes
Country pair FE	Yes	Yes	Yes

Robust standard errors in parentheses (clustered by country pair)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Results (Quantile Regression)

	(1) Q(0.10) CY&CP FE	(2) Q(0.25) CY&CP FE	(3) Q(0.50) CY&CP FE	(4) Q(0.75) CY&CP FE	(5) Q(0.90) CY&CP FE
$\ln(Y_{it} \cdot Y_{jt})$	0.378***	0.417***	0.457***	0.500***	0.563***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
FTA_{ijt}	-0.038*	0.013***	-0.059***	-0.023**	-0.186***
	(0.02)	(0.00)	(0.00)	(0.01)	(0.01)
BIT_{ijt}	-0.126***	-0.066***	-0.119***	0.067***	0.011**
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
NYC_{ijt}	0.041***	0.131***	0.164***	0.204***	0.192***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
$NYC1_{ijt}$	-0.093***	-0.112***	-0.023***	-0.081***	0.043***
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Observations	39393	39393	39393	39393	39393
Average Project size (mUSD)	4.54	13.99	27.9	61.09	78.99

Bootstrap standard errors in parentheses,
Country pair, country*year (3 years) and year fixed effects included. Dep variable: ln(FDI+1)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

bias stemming from firm heterogeneity (Paniagua, Figueiredo and Sapena, 2015).

The results reported in Table 4 show the varying incidence of the gravity variables in FDI. Column 1 contains the results of 0.25 percentile, Column 2 the median, column 3 percentile 0.75, and finally column 4 shows percentile 0.90. Overall, the quantile results are in line with our expectations related to impact of arbitration on smaller investments. Focusing on the variables of interest, the effect of arbitration is clearly higher in the upper levels of FDI. The effect of the NY Convention on FDI, for both home and host countries, is more noticeable in the upper levels of FDI where projects are larger. Arbitration does have an effect on the lower levels, but its magnitude is lower.

The quantile regressions in Table 4 sheds light on the relative costs of arbitration versus the project size. The higher positive impact of arbitration is highest for projects above 60 million dollars (in constant 2005 US dollars). We also observe FDI diversion

for investments under 79 million dollars. That is, investors invest smaller amounts in non-signatory countries for projects below this threshold. We observe a positive effect on third countries only when the bilateral FDI relationship is particularly intense. A strong FDI relationship counterbalances the negative third country effects. This suggests that new signatories' FDI is diverted from non-member countries with low levels of bilateral investment towards members (regardless of their FDI level) and non-members with high bilateral FDI. This result has interesting policy implications since it suggests countries have an incentive to increase arbitral quality to prevent FDI diversion of smaller projects.

Moreover, these results unravel some puzzling results of previous estimations. For example, BIT is associated with lower levels of FDI for levels below the median and has a positive sign in the upper quantiles. This result is compatible with the view that multinational corporations use more complex institutional agreements for larger investments. Conversely, belonging to an FTA is barely significant in column 1, is positive in column 2, and has a negative sign above the median in column 3.[15] Our results suggest that the happy few MNEs in the upper levels of FDI face lower transaction costs than reported in previous studies (Mayer and Ottaviano, 2008; Paniagua, Figueiredo and Sapena, 2015), as some commercial risks are offset by arbitration.

Moreover, these results unravel some puzzling results of previous estimations. For example, BIT deters FDI for levels below the median and increases FDI for the upper quantiles. This result is compatible with the view that multinational corporations use more complex institutional agreements for larger investments. The effect of FTA follows the BIT's trend, that is, negative in column 1 and 2 and positive in columns 3 and 4 of Table 4. This is consistent with the assumption that complex FDI projects substitute for trade when the transaction costs are high enough. On the other hand,

[15]In the appendix, we also show that the effect of distance is higher for the median and the 75 percent quantile than for the upper and lower percentiles.

Table 5: Results (Endogeneity)

	FDI flows		Extensive Margin	
	(1) CP FE System-GMM	(2) CP FE System-GMM	(3) CP FE System-GMM	(4) CP FE System-GMM
lnN_{ijt-1}			0.073***	0.062***
			(0.01)	(0.01)
$lnFDI_{ijt-1}$	0.063***	0.054***		
	(0.01)	(0.01)		
$\ln(Y_{it} \cdot Y_{jt})$	0.969***	0.853***	0.374***	0.400***
	(0.15)	(0.07)	(0.04)	(0.02)
FTA_{ijt}	-0.503***	-0.383**	-0.021	0.0117
	(0.19)	(0.18)	(0.05)	(0.04)
BIT_{ijt}	-0.221	-0.194	-0.072**	-0.0425
	(0.17)	(0.17)	(0.04)	(0.03)
NYC_{ijt}	0.432**		0.087**	
	(0.17)		(0.04)	
$NYC1_{ijt}$	-0.252		-0.123*	
	(0.27)		(0.07)	
NYC_{it}		0.353		0.0159
		(0.24)		(0.04)
NYC_{jt}		0.378*		0.116**
		(0.19)		(0.05)
Dep. Variable	ln(FDI+1)	ln(FDI+1)	ln(Projects+1)	ln(Projects+1)
Observations	35421	35421	35421	35421
Year FE	Yes	Yes	Yes	Yes
Country Pair FE	Yes	Yes	Yes	Yes

Notes: Robust standard errors in parentheses (clustered by country pair)
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

trade agreements attract smaller projects. Moreover, the effect of distance is higher for the median and the 0.75 quantile than for the upper and lower percentiles. In sum, the *happy few* MNEs in the upper levels of FDI face lower transactions costs (Mayer and Ottaviano, 2008; Paniagua, Figueiredo and Sapena, 2015) as they are able to reduce commercial risks with arbitration.

5.4 Endogeneity

It is a fair assumption that the results presented in Table 2 are not free from endogeneity. This section applies standard system GMM techniques to overcome this problem[16]. The results are suggestive that the NY Convention has a causal impact on FDI. The results are only suggestive because it is difficult to distinguish between the hypothesis that joining the NY Convention causes an increase in FDI, from the alternative hypothesis that unobservables that lead countries to benefit from joining the NY Convention induces them to join the NY Convention.

Table 5 shows the results from the system GMM. The first column of Table 5 reports the results for the effect of arbitration at the country-pair level. Since the panel estimation system-GMM is not compatible with zeros, we follow Busse, Königer and Nunnenkamp (2010b), who add one to FDI to identify zeros.

The results suggest that the effect of the NY Convention is significant and positive after controlling for endogeneity with this method. Moreover, GMM seeks to eliminate additional endogeneity bias in the rest of independent variables. Hence, BIT's estimated coefficient is not significant. FTAs have a negative impact on FDI, as expected in trade-FDI substitute scenario. However, the effect of arbitration on third countries is not robust (i.e., the coefficient captured by $NYC1_{ijt}$ is not significant). The results at the country level shown in column 2 confirm that the positive effect of arbitration is only positive and significant for hosts, regardless of the membership of the source country. The second part of Table 2 repeats the exercise for the extensive margin. The results are very similar to those of the invested volumes. In line with our previous results, our findings suggest that arbitration leads to larger international projects rather than more projects. For example, the estimated coefficient for the host's NY Convention membership (0.087) is lower than the one for FDI flows (0.432).

[16]A robustness check using instrumental variables is included in the online Appendix.

6 Concluding Remarks

This paper has explored the role that international commercial arbitration plays in FDI. We have explored its theoretical mechanisms and tested its effects on bilateral data. This research provides several contributions to the literature: (1) it explains the mechanisms by which arbitration affects FDI; (2) it suggests that countries' arbitration regimes have a positive effect on FDI, that is, the positive shock to countries' arbitration regimes from joining the NY Convention increases the levels of bilateral FDI; (3) the effect of arbitration reduces costs associated with domestic judicial systems; (4) the improvement in countries' arbitration regimes tends to have a larger effect on the volume of FDI investments, rather than the number of foreign projects; (5) the effect of arbitration is greater in higher FDI levels and (6) a positive shock on a country's international arbitration diverts FDI from non-members with low bilateral FDI. The main policy implications are that countries can increase FDI volumes and prevent FDI diversion by strengthening their arbitration regimes. For example, by improving the domestic laws that pertain to international commercial arbitration, and assuring their effective enforcement by domestic judiciaries.

A Appendix

A.1 Data Description

The Financial Times Ltd. cross-border investment monitor FDIMarkets (2013) is the source of the FDI dataset. Investment counts (i.e. the extensive margin) are measured in firm level projects counts and capital flows in constant 2005 dollars. The dataset covers bilateral firm-level greenfield investments from 2003 to 2012, aggregated between 190 countries. The list of countries is shown in Table A.1.

Other types of FDI (e.g. joint ventures or mergers) may also make use arbitration to settle disputes. However, the effect of improved contract enforcement on mergers or joint venture is ambiguous because improved contract enforcement allows firms to align incentives with a smaller equity stake. The reduction in equity investment required can offset the increase in total investment from improved contract enforcement, leading on net to a smaller investment by MNEs. Therefore we focus on greenfield investments where contract enforcement has a less ambiguous impact on the size of investment, and a host's policies are be expected to have a significant effect (Nocke and Yeaple, 2007; Qiu and Wang, 2011). For a detailed description of the refer to Paniagua and Sapena (2014). Overall, the database is heavily unbalanced with 70% zero observations, meaning that not all countries received investment in all years. The dataset has been built following Paniagua's (2016) procedure to construct gravity datasets with abundant zeros.

The World Bank (2013) is the source legal rights and GDP, measured in constant 2005 US dollars. The variable *rights* measures the strength of legal rights with an index ranging from 0 (weakest) to 10 (strongest). This index is maintained by the World Bank since 2004 and measures the degree to which domestic laws protect the rights of borrowers and lenders in the countries in the sample.

Institutional agreements such as Free Trade Agreements and Bilateral Investments Treaties reduce the uncertainty in foreign investments (Bergstrand and Egger, 2013). BIT is manually constructed with data from UNCTAD (2013). The source of FTA is Head, Mayer and Ries (2010) complimented with UNCTAD (2013) data. The data from the NY Convention come from the website: www.newyorkconvention.org.

A.2 Robustness (Online Appendix)

The aim of this online Appendix is to present additional empirical evidence on the effect of arbitration on FDI. We start by relaxing the constraints imposed by a

Table A.1: List of Countries

Afghanistan, Albania, Algeria, Angola, Antigua, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Canada, Cape Verde, Cayman Islands, Central African.., Chad, Chile, China, Colombia, Comoros, Congo (DRC), Costa Rica, Cote d'Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Djibouti, Dominica, Dominican Repub., Ecuador, Egypt, El Salvador, Equatorial Guin.., Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Polynesia, Gabon, Gambia, Georgia, Germany, Ghana, Greece, Greenland, Grenada, Guadeloupe, Guatemala, Guinea, Guinea Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macedonia FYR, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Martinique, Mauritania, Mauritius, Mexico, Moldova, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Myanmar (Burma), Namibia, Nepal, Netherlands, New Caledonia, New Zealand, Nicaragua, Niger, Nigeria, North Korea, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Republic of the.., Romania, Russia, Rwanda, Saint Vincent, Sao Tome, Saudi Arabia, Senegal, Serbia, Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, Somalia, South Africa, South Korea, Spain, Sri Lanka, St Lucia, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Turks and Caico, Uganda, United Kingdom, Ukraine, United Arab Emirates, United States, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zambia, Zimbabwe.

Table B1: Variable Dictionary and Summary Statistics

Variable	Description	Units/Type	mean	sd	min	max
$\ln(D_{ij})$	Distance	Kilometers	8.31	1.00	4.08	9.88
$border_{ij}$	Border	Dummy	0.06	0.24	0	1
$lang_{ij}$	Common language	Dummy	0.16	0.36	0	1
col_{ij}	Colony	Dummy	0.05	0.21	0	1
$smctry_{ij}$	Same Country	Dummy	0.02	0.13	0	1
rel_{ij}	Religion	Index	0.33	0.31	0	1
$locked_{ij}$	Landlocked	Augmented dummy	0.26	0.47	0	2

structural estimation of country pair dynamic panel. We proceed by dropping CPFE and substituting CYFE by CFE. The basic assumption behind this specification is that third country effects are constant. This would mean that total factor productivity is constant in all countries during the decade under study. We control for unobserved heterogeneity at the country pair level with standard gravity variables (distance, border, colony, common language, same-country, religion and landlocked). In particular, we estimate the following augmented gravity equation:

$$FDI_{ijt} = \exp\left(\begin{array}{c} \beta_1 \ln(Y_{it} * Y_{jt}) + \beta_2 \ln(D_{ij}) + \beta_3 border_{ij} + \beta_4 colony_{ij} + \\ \beta_5 lang_{ij} + \beta_6 smctry_{ij} + \beta_7 rel_{ij} + \beta_8 locked_{ij} + \beta_{10} BIT_{ijt} + \\ \beta_{11} FTA_{ijt} + \beta_{12} NYC_{it} + \beta_{13} NYC_{jt} \\ \beta_{14} rights_{it} + \beta_{15} rights_{jt} + \beta_{16} rights_{it} * NYC_{it} + \beta_{17} rights_{jt} * NYC_{jt} \\ \beta_{18} \ln(D_{ij}) * NYC_{it} + \beta_{19} \ln(D_{ij}) * NYC_{jt} + \lambda_i + \lambda_i + \lambda_t \end{array}\right) + e_{ijt} \tag{13}$$

Summary statistics of the additional control variables and dictionary for the variable names are shown in Table B1.

Distance, common language, colony and border come from the CEPII (2011) database and control for freight, information, cultural, historic and administrative transaction costs between country pairs. Religious affinities increases the probability of economic

transactions between nations with similar values and beliefs (Helble, 2007). The variable religion is calculated with data from CIA World Factbook (2011) according to following formula for country each country pair: $\%Christian_i * \%Christian_j + \%Muslim_i * \%Muslim_j + \%Hindu_i * \%Hindu_j + \%Jewish_i * \%Jewish_j$.

Although equation (13) is biased due to the reason explained in the empirical section, it offers several additional insights. Since CYFE are not included we are able to distinguish between home and host effects. Furthermore, CPFE might capture partly the effect of arbitration in reducing distance costs.

Table B2 reports the results for both margins. As expected, most coefficients are statistically significant with the expected signs. In particular, countries with larger economies invest more, and more distant countries invest less. Sharing a common language, religion or colonial link increases investment across borders. Additionally, we have run OLS regressions to measure the effect of omitting zeros. For example, the same country, border, landlocked and trade agreements have no significant impact on FDI on the CFE-OLS regressions. The PPML with a set of CFE and year dummies (CFE-PPML) overcomes country and firm-selection bias stemming from the omission of zeros. This empirical setup corrects the signs of FTA (now positive) and BIT (not significant). Focusing on the variables of interest, the OLS finds no significant effect of the NY Convention on source countries. Conversely, PPML-CFE estimates of NYC_{it} report positive and significant effects. Henceforth we discuss our preferred PPML estimator.

With regard to our main variable of interest, the NY Convention has a positive and significant sign for both the investor and investee. This is consistent with the benefit that the NY Convention provides of allowing both parties in the contract to enforce arbitration rulings in the other firms' domestic courts (Berkowitz, Moenius and Pistor, 2006, p. 371). Moreover, our robustness analysis confirms our previous results that suggested the effect is greater on the intensive than on the extensive margin.

Table B2: Robustness Results (FDI)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	PPML	OLS	PPML	OLS	PPML	OLS	PPML
	FDI volumes				FDI projects			
$\ln(Y_{it} \cdot Y_{jt})$	0.338**	-0.198	0.344**	-0.085	0.182***	-0.352	0.244***	-0.225
	(0.13)	(0.24)	(0.15)	(0.27)	(0.05)	(0.29)	(0.06)	(0.27)
$\ln(D_{ij})$	-0.429***	-0.336***	-0.434***	-0.358***	-0.256***	-0.369***	-0.258***	-0.372***
	(0.04)	(0.05)	(0.04)	(0.05)	(0.02)	(0.03)	(0.02)	(0.03)
$border_{ij}$	0.0864	0.0386	0.0715	0.0274	0.0558	-0.130*	0.0610	-0.133*
	(0.09)	(0.13)	(0.09)	(0.12)	(0.05)	(0.07)	(0.05)	(0.07)
$lang_{ij}$	0.172**	0.489***	0.176**	0.461***	0.172***	0.511***	0.172***	0.490***
	(0.07)	(0.11)	(0.07)	(0.11)	(0.04)	(0.05)	(0.04)	(0.06)
col_{ij}	0.567***	0.513***	0.554***	0.524***	0.427***	0.625***	0.423***	0.625***
	(0.0912)	(0.110)	(0.09)	(0.11)	(0.05)	(0.08)	(0.06)	(0.08)
$smctry_{ij}$	0.147	0.387	0.155	0.310	0.145	0.571***	0.122	0.572***
	(0.16)	(0.24)	(0.16)	(0.23)	(0.09)	(0.14)	(0.09)	(0.14)
rel_{ij}	0.498***	0.839***	0.533***	0.828***	0.230***	0.415***	0.242***	0.398***
	(0.124)	(0.229)	(0.12)	(0.23)	(0.06)	(0.13)	(0.06)	(0.13)
$locked_{ij}$	0.002	-0.112	0.001	-0.092	0.011	-0.049	0.013	-0.043
	(0.0586)	(0.0906)	(0.06)	(0.09)	(0.03)	(0.05)	(0.03)	(0.05)
FTA_{ijt}	-0.011	0.241**	-0.005	0.235**	0.001	0.247***	0.004	0.254***
	(0.07)	(0.10)	(0.07)	(0.11)	(0.04)	(0.07)	(0.04)	(0.07)
BIT_{ijt}	-0.170***	-0.0949	-0.157***	-0.082	-0.106***	-0.006	-0.103***	-0.001
	(0.05)	(0.07)	(0.05)	(0.07)	(0.02)	(0.04)	(0.02)	(0.04)
NYC_{it}	0.485	0.748*	1.179	1.107	0.114	0.672***	-0.224	1.028**
	(0.31)	(0.39)	(0.79)	(1.40)	(0.12)	(0.23)	(0.34)	(0.51)
NYC_{jt}	0.339*	0.542**	0.688*	2.045***	0.174**	0.462***	0.376**	0.965***
	(0.19)	(0.25)	(0.37)	(0.46)	(0.07)	(0.10)	(0.15)	(0.27)
$rights_{it}$			0.432**	0.257			-0.047	0.128
			(0.16)	(0.33)			(0.07)	(0.10)
$rights_{jt}$			0.105	0.411***			0.042	0.075
			(0.08)	(0.08)			(0.03)	(0.05)
$rights_{it} * NYC_{it}$			-0.322*	-0.188			0.055	-0.110
			(0.17)	(0.33)			(0.08)	(0.10)
$rights_{jt} * NYC_{jt}$			-0.092	-0.418***			-0.057	-0.143**
			(0.08)	(0.08)			(0.03)	(0.06)
$\ln(D_{ij}) * NYC_{it}$			-0.142	-0.206			0.121	0.747***
			(0.16)	(0.32)			(0.07)	(0.12)
$\ln(D_{ij}) * NYC_{jt}$			-0.058	0.205**			0.079*	0.435***
			(0.08)	(0.11)			(0.04)	(0.08)
Dep. Variable	lnFDI	FDI	lnFDI	FDI	lnProjects	Projects	lnProjects	Projects
Observations	14330	39181	13274	35226	14330	39181	13274	35226
R^2	0.28	0.44	0.29	0.44	0.55	0.78	0.55	0.79
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses (clustered by country pair). Country and year fixed effects included
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Columns (4) and (8) report the results of the interaction with legal rights and distance for investment volumes and projects respectively. The results obtained are in line with our baseline specification, where we showed that arbitration reduced the effect of better legal in the host.

However, the estimation of the interaction between NY Convention and distance is now significant and positive (our base estimations yielded not significant results). Allowing for a certain degree of unobserved heterogeneity at the country pair level, this result suggest that arbitration offsets distance costs completely when both countries in the pair join the NY Convention. That is, arbitration might be a way for MNEs to reduce the transaction costs associated with distant hosts and might shed some light on the role of distance in FDI. There are only a handful empirical studies that estimate a positive effect of distance on FDI (for exceptions see Daniels and Ruhr (2014) and Egger and Pfaffermayr, 2004). According to the proximity-concentration trade-off (Brainard, 1997; Carr, Markusen and Maskus, 2001), distance should have a positive effect on FDI Markusen (2002). Proximity to customers abroad saves trade costs while concentration of production (at home) reduces plant costs. Our results are consistent with the notion that when firms are able to use a familiar legal system - international commercial arbitration - the transaction costs that arise from distance are reduced. This suggests that when the institutional risks are low enough companies prefer to serve distant foreign markets with FDI rather than exports.

A.3 Quantile regressions

In table B3 we follow the same approach as above and relax the number of fixed effects in the regression. We are then able to differentiate between home and host effects. The results reported in Table B3 confirm our baseline quantile results where we discovered that the impact of arbitration is higher in FDI's upper quantiles. We can

appreciate how this upper trend is present for both host and home countries.

A.4 Endogeneity

We perform additional tests with other variables as instruments. Our approach is to use spatial and time instruments. We use instruments from the literature on BITs and FTAs, which highlights spatial, e.g. neighboring diffusion (Neumayer and Plümper, 2010) and timing dependencies (Baier, Bergstrand and Mariutto, 2014; Baier and Bergstrand, 2009). Namely, (i) the number of neighbors who have joined the NY Convention, and (ii) the sum of the number of years that neighbors have been members of the NY Convention. These instruments should be independent of FDI and solely affect the likelihood that a country will join the NY Convention. We start with a conventional two-stage least square 2SLS estimator, sine it provides a standard way to test the validity of the instruments. Moreover, to eliminate the firm-selection bias stemming from zeros, we use the IV-PPML, which is the two stage instrumental variable version of PPML (Windmeijer and Silva, 1997)[17].

Column 1 in Table B4 reports the 2SLS results fro investment volumes. According to Wooldridge's (1995) robust score test of over-identifying restrictions, we cannot reject the null hypothesis that our instruments are valid at the 1% level. Both 2SLS IV-PPML estimates show a positive and significant coefficient sign for the NY Convention. The magnitude effect of this IV variable, however, appears to be overestimated.

The exercise is repeated for the extensive margin in the two columns of Table B4. The results are not as consistent as the aggregate flows. According to Wooldridge's (1995) robust score, we can discard the instruments used for the number of projects for

[17]We focus on the host's Convention variable.

Table B3: Robustness Results (Quantile Regression)

	(1)	(2)	(3)
	Q(0.25)	Q(0.5)	Q(0.75)
$\ln(Y_{it} \cdot Y_{jt})$	0.592***	0.744***	0.804***
	(0.01)	(0.01)	(0.01)
$\ln(D_{ij})$	-0.861***	-1.241***	-1.194***
	(0.02)	(0.03)	(0.02)
$border_{ij}$	0.202***	0.117***	0.449***
	(0.02)	(0.03)	(0.03)
$lang_{ij}$	0.449***	0.512***	0.471***
	(0.01)	(0.01)	(0.03)
col_{ij}	0.877***	1.238***	0.876***
	(0.01)	(0.04)	(0.03)
$smctry_{ij}$	0.196***	-0.0001	0.243***
	(0.01)	(0.01)	(0.02)
rel_{ij}	0.583***	0.367***	0.402***
	(0.01)	(0.03)	(0.04)
$locked_{ij}$	0.042***	-0.087***	0.020**
	(0.01)	(0.01)	(0.01)
FTA_{ijt}	0.128***	0.0544	-0.209***
	(0.01)	(0.06)	(0.01)
BIT_{ijt}	-0.101***	-0.058***	0.0944***
	(0.01)	(0.01)	(0.01)
NYC_{it}	0.097***	0.096**	0.275***
	(0.01)	(0.02)	(0.02)
NYC_{jt}	0.106***	0.086***	0.289***
	(0.01)	(0.01)	(0.01)
Dep. Variable	FDI	FDI	FDI
Observations	39201	39201	39201
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Boostrap standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the 2SLS estimation[18].

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[18]Additionally, IV-PPML did not converge for the extensive margin.

Table B4: Results (Endogeneity)

	(1) 2SLS	(2) IV-PPML	(3) 2SLS
$\ln(Y_{it} \cdot Y_{jt})$	0.303***	0.267***	0.112***
	(0.01)	(0.01)	(0.01)
$\ln(D_{ij})$	-0.193***	-0.160***	-0.063***
	(0.02)	(0.01)	(0.008)
$border_{ij}$	0.483***	0.140***	0.191***
	(0.06)	(0.03)	(0.02)
$lang_{ij}$	0.627***	0.316***	0.253***
	(0.05)	(0.03)	(0.01)
col_{ij}	0.769***	0.280***	0.327***
	(0.06)	(0.03)	(0.02)
$smctry_{ij}$	-0.300***	0.017	-0.115***
	(0.09)	(0.05)	(0.03)
rel_{ij}	-0.299***	-0.091***	-0.111***
	(0.05)	(0.04)	(0.02)
$locked_{ij}$	-0.0662*	-0.056	-0.0241*
	(0.03)	(0.02)	(0.01)
FTA_{ijt}	-0.250***	-0.016	-0.116***
	(0.04)	(0.03)	(0.01)
BIT_{ijt}	0.147***	0.132***	-0.111***
	(0.03)	(0.02)	(0.01)
NYC_{jt}	4.175***	4.597***	1.920***
	(0.62)	(1.53)	(0.22)
Dep. Variable	ln(FDI+1)	FDI	ln(Projects+1)
Observations	39201	39201	39201
Year FE	Yes	Yes	Yes
Wooldridge score	1.529		423.5
	(p = 0.21)		(p =0.0)

Notes: Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Wooldridge's (1995) robust score test for over-identification of instruments

Instruments: Number of neighbors with NYC and Sum of years since neighbors signed NYC

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