Opportunism, Corruption and the Multinational Firm's Mode of Entry[1]

Stéphane Straub
University of Edinburgh

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[1]Correspondence: stephane.straub@ed.ac.uk. Department of Economics, University of Edinburgh, William Robertson Building, 50 George Square, Edinburgh EH8 9JY, UK. Tel: +44 131 650 8359. Fax: +44 131 650 4514

Abstract

The paper models the boundaries of the multinational firm by looking at a simple trade-off between FDI (internal expansion with strong control rights) and debt (arm's length expansion with loose control rights) in the context of contractual incompleteness due to institutional constraints in host countries, i.e. problems of commitment and, especially, corruption. It develops a theoretical approach to the two main types of corruption: petty bureaucratic corruption and high-level political corruption. The model predicts that multinational firms prefer FDI the weaker the ability to commit of the host country, while both types of corruption shift the trade-off marginally toward debt. Cross-country panel empirical evidence supports these conclusions.

JEL Codes: F2, F3. Keywords: FDI, Debt, Multinational firms, Capital flows, Expropriation, Corruption.

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1 Introduction: Foreign Direct Investment, Debt, and the Boundaries of the Multinational Firm

Attracting foreign direct investment (FDI) is often considered as an important policy objective in developing countries. Justifications for this are various. From a macroeconomic perspective, the argument starts from the necessity to attract external savings to augment insufficient national savings and allow a higher level of investment in order to boost growth. Moreover, since capital flows are supposed to have different degrees of stability depending on their nature, FDI is perceived as safer for the country than other types of capital, such as long term debt that may be difficult to roll over when the economic context changes (e.g. the debt crisis of the 80's), and especially short-term inflows that may reverse quickly in case of shocks (as happened in Latin America after the 1995 Mexican crisis or in 1997 in some Asian countries)[1]. From a microeconomic perspective, it is generally stressed that FDI improves the efficiency of capital, through transfers of technologies and formation of human capital, as well as through important spillovers and externalities in the whole industrial sector of the receptor country. These last effects, the argument goes, are even stronger in a dynamic perspective, as FDI also stimulates competition.

The weak point, however, is the lack of a satisfactory theory of FDI. The nature of the multinational firm itself has received a limited treatment in the theory of international trade, in particular in the so-called "new trade theory" and the "geography and trade" literature, as noted by Krugman (1995), pp. 1274-75: "Where the failure to have a real theory of the boundaries of the firm becomes truly serious, however, is of course in the analysis of multinational firms. (...) Why, exactly, did United Fruit want to own Central American banana plantations (and often the republics in which they were located), while many US sellers of personal computer clones seem reconciled simply to contract with their Korean or Taiwanese suppliers? The answer is not at all obvious from the international economics literature."

The first issue stressed in this paper is that most of the effects attributed to FDI are in fact produced by multinational enterprises (MNE) expanding

[1] To quote just some recent references on the stability and behavior of different types of capital inflows, see Frankel and Rose (1996) and Sarno and Taylor (1999).

their activities to new markets and by the international diffusion of technological progress and corporate best practices, but that this expansion does not necessarily take the form of FDI. As a consequence, evaluating the challenge of the attraction of technology for developing countries requires first a theory of the boundaries of the multinational firm.

In the last 20 years, the theoretical literature on multinational firms (see Markusen, 1995, for a review) has basically developed around Dunning's "OLI" framework, which explains the multinational quality of a firm by mixing technological and organizational characteristics (ownership), efficiency of trade arguments (location), and considerations about the form of the involvement in a foreign country (internalization). The first two points refer to why firms may want to expand abroad, while the third one has to do with the financial structure they give to their expansion. The decision of whether to engage in FDI or not obviously belongs to this third category and is only relevant if the two first points justify the multinational nature of the firm. To summarize, two different trade-offs are involved: the first one responds to ownership and location motives and is about going multinational vs. staying national; whenever this first problem is resolved in favor of multinational expansion, a second trade-off arises for the firm, which is about exploiting its potential advantages internally by investing directly in foreign countries vs. simply selling or licensing its technology.

To focus on this second trade-off, consider the internationally accepted definition of FDI from the IMF's 1993 Balance of Payments Manual:

"*Foreign Direct Investment is net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock*[2]*) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, and short- and long-term intercompany loans between parent firms and foreign affiliates.*"

From a standard corporate finance perspective, FDI is thus not the investment itself (the plant, the assets) but a particular way to finance this investment, namely through equity and internal loans, that induces tighter control rights on the subsidiary. An alternative way for the multinational firm to take advantage of its specific assets would be to sell them directly to the host country or to engage, as mentioned before, in some licensing agreement, in which case it would in fact choose to hold a claim with looser control rights on the project, which I broadly define as debt[3]. Whether the firm

[2] In practice, some countries set a higher threshold.

[3] The "Debt" denomination covers here, somewhat abusively, claims of different nature which have in common that they imply less control rights than FDI. A classification of claims from the more junior to the more senior ones would be: 100% ownership FDI, joint venture with more than 10% participation (thus still considered as FDI), joint venture

prefers holding equity (FDI) or debt (selling or licensing) then depends on the nature of the project and on the particular kind of risks it faces (see Hausmann and Fernández-Arias, 2000, for an interesting discussion along these lines). These must be understood broadly as including specific industrial or climatic risks, as well as factors resulting from the nature of the information available to the parties and the institutional structure of the host country. Default on debt by sovereign borrowers, direct or indirect expropriation of investments, and cases of corruption are some well known problems plaguing relationships between foreign investors and host countries, in particular in less developed countries (LDCs). We should expect these features to have a significant impact on the financial decision of the firms seeking to invest abroad.

This paper's objective is thus to offer a simple theory of the multinational firm's boundaries in the presence of institutional constraints, focusing specifically on the problem of corruption. Additionally, it provides some preliminary empirical tests supporting the conclusions of the model, using data on the cross-country composition of capital flows for the 1985-1999 period.

The model's basic building block draws on Williamson (1975), Hart and Moore (1990) and Hart (1995): By taking or not a specific action (here a sunk investment to retain some "secret" on the technology) the firm chooses ex ante the financial structure of its investment, which has an influence on its bargaining position in subsequent periods. The incompleteness of contracts, arising from the possibility that the host country may renege on its commitment, implies that the returns from the relationship depend precisely on this ex post bargaining position, and so the ownership structure's decision is not neutral. At this stage, looking at the composition of private capital flows, the model provides a result in line with the existing literature, namely that countries with lower levels of commitment receive a higher share of direct investment because this type of involvement allows investors for an outside option in case of conflict[4].

To capture in a simple way the "institutional effects" of information, and allow for corruption to arise endogenously, I introduce the fact that the real value of the flow of externalities is known to the investing firm, but uncertain for the host country, which has only prior subjective beliefs about it. To model this, I extend under asymmetric information a simple game form implementing the Nash bargaining solution, originally proposed in a complete information setting by Howard (1992) and Osborne and Rubinstein (1994).

with less than 10% participation, licensing (where the firm retains some technological "secret" and get royalties), and debt (pure cession of the technology). For simplicity, in what follows I will stick to the term debt, used to design a claim with weak control rights.

[4]See for example Albuquerque (2003) and other references discussed below.

The paper's main contribution is to propose a theoretical approach to the effects of corruption on foreign investment decisions. Two aspects are worth mentioning. First, corruption is modelled as a game in which stakes and side-contracts are endogenous. This is done by adapting the principal-agent information-based model of corruption, in which an intermediate bureaucrat is in charge of reducing the uncertainty on behalf of the principal (see Laffont and Tirole, 1991), to the game-theoretic investment framework, and also by considering the possibility of outright extortion, again interacting with the firm's private information rents.

Second, corruption in the context of capital flows and foreign investment is a multifaceted phenomenon[5]. I argue that corruption in such a context can usefully be categorized in two main types. The next section documents and discusses these two different types of corrupt constraints.

1.1 Corruption and Foreign Investment

Bureaucratic Corruption

In the first version, I focus on corrupt demands faced by firms once settled in the foreign country. These demands, in the form of excessive administrative requirements, red tape and systematic bribe extraction by low-level government officials, are the manifestations of corruption most commonly evoked in the literature, as illustrated for example by Wei (2000) Wei and Wu (2001) and Smarzynska and Wei (2000). Morisset and Lumenga Neso (2002) document extensively the administrative barriers faced by foreign investors in a sample of 32 developing countries, listing them in 3 categories: Entry approvals; land, site development and utility; and operational requirements. They show that such requirements are pervasive, the sample averages being 53 procedures and 443 days, and that higher costs and delays are strongly correlated with the prevailing level of corruption, as measured by the Transparency International index. Rose-Ackerman (1999) also offers numerous examples of such corruption. I shall refer to this case as "bureaucratic corruption".

I model the multinational firm dealing with a potentially corrupt local bureaucracy by assuming that government officials in charge of allocating a license-type of good may require a bribe in exchange for the delivery. Foreign firms are clearly at a disadvantage compared to local counterparts, because of their lack of personal connections and knowledge of the local customs Furthermore, in this case of petty corruption, it makes sense to assume that

[5]I thank two anonymous referees and the editor for stressing this aspect.

bureaucrats have no specific information on the firm's profit[6], so I simply consider that they chose the amount of the bribe by maximizing their return in a context in which they risk being detected and punished. The level of bribes then depends on how prone to corruption the environment is, and so does the firm's ownership decision. The model provides a clear and direct effect, namely that in a more corrupt setting, the trade-off becomes marginally more favorable to debt.

Political Corruption

In the second story, corruption emanates from the interaction between the firm wanting to invest and some high-level government official in charge of assessing the value of the investment and of negotiating benefits to be granted to the incoming investors on behalf of the country. I shall label it "political corruption" to distinguish it from the previous story. It will become clear below that the firm and local counterparts are equally involved in the dishonest deals.

There are also plenty of illustrations of this type of behavior. While an adviser to a Latin American government a few years ago, I observed that representatives of foreign firms looking for investment opportunities in the country would almost invariably be attended by very high-ranking officials. It appeared that such practices often led to some rent extraction, for example in the form of future joint ventures with officials' front-men or by securing employment for relatives in the newly established firms[7]. In some sense, such meetings could be considered as evaluation rounds to assess how much would be extracted from the incoming investment. On the other hand, firms might find an interest in entering such deals if they perceive that the resulting connections may eventually help them securing specific markets or investment opportunities. for example in procurement or privatization processes[8].

Again, examples abound. Rose-Ackerman (1999) relates examples of firms bribing high-level officials to obtain favorable treatment in privatization, from the case of an Italian firm interested in a Greek cement company to similar examples from Argentina, Peru, Zaire, Ivory Coast, Thailand and Slovakia. Hines Jr. (1995) discusses evidence from a survey of 2,219 US business executives in which nearly half of them would find no ethical impediment in paying bribes to further their company's objectives. Looking at the behavior of OECD firms in the aftermath of the OECD anti-bribery convention, and with the US Foreign Corruption Practice Act (FCPA) in place for about 30

[6]The possible partial relaxation of this hypothesis is discussed in the modeling section.

[7]See Hines Jr. (1995) for empirical evidence that the "payroll" type of corruption is indeed important.

[8]Note that in countries that have undergone significant privatizations in recent years, these in general accounted for the bulk of incoming FDI.

years, Kaufmann (2004) concludes that they are "still extensively engaged in bribery". He also reports that bribery by OECD based firms in foreign countries sometimes exceeds that of local firms, giving evidence of a two-sided corruption game between government officials and foreign investors.

The organization Transparency International releases since 1999 a bribe payers index (BPI) emphasizing the supply side of corruption. It makes clear that firms from different geographical origins have varying propensity to bribe[9] and that, overall, there is "no doubt that large numbers of multinational corporations from the richest nations are pursuing a criminal course to win contracts in the leading emerging market economies of the world." Furthermore, while public works and construction, as well as the arms and defence sectors, are particularly prone to corruption by foreign firms, such behavior is also observed, for example, in agriculture, leaving virtually no sector untouched.

Finally, abundant press articles have reported cases of firms buying their way into foreign oil, gas or telecommunication markets, among others. To mention only a few, examples include the involvement of a French oil company (formerly Elf, now merged with Total) in cash payments to high government officials (including presidents) in Nigeria and Gabon; commissions paid by a consortium including French Technip, Italian Snamprogetti and US KBR, filial of Halliburton, to secure contracts in Nigeria; bribes paid by the French electronic group Thales in Argentina in the 1990s; and accusations of corruption against the French firm Alcatel, the Spanish electric equipment provider Inabensa and Swedish Ericsson, to secure telecommunication contracts in Costa Rica[10].

Together, petty bureaucratic corruption and high-level political corruption can be argued to capture most of the corruption cases happening in practice in the context of foreign investment. The main difference is that bureaucratic corruption take the form of outright extortion and imposes a pure loss on the firm, while political corruption generates the opportunity of a gain for both the government and the firm, who are thus jointly responsible for the corrupt transaction.

I model the second approach by assuming that a local politician is in charge of evaluating the value of the project. This is a way to inform further bargaining between the firm and the government, to define the content of the incentive package to be given to the firm, or even to decide whether to attribute it a specific market. Conceptually, the politician is an intermedi-

[9] Companies from Russia, China, South Korea, Italy, the US, France and Spain for example, have particularly bad scores. See press releases on the Bribe Payers Index at http://www.transparency.org.

[10] See articles in The Economist, 13/11/03, and Le Monde, 16/10/04 and 05/11/04.

ate agent between the principal and the firm, whose contractual role is to reduce the asymmetry of information on behalf of the principal. One simple possibility is a political appointee of a government trying to maximize a welfare objective function (note that non fully benevolent objective function can be accommodated under this approach). Alternatively, the principal can be thought of as the public, represented by the idea embodied in the constitution or in the grand contract with the government in charge, in which case the politician can even be the ruler himself as in some of the examples above (see Laffont and Tirole, 1993). The politician is entrusted with a role in the maximization of some welfare function and enjoys decentralized power in the form of information not directly verifiable by the principal.

This then gives rise to the possibility of corruption, whereby a better informed agent takes advantage of her position to make a side contract with the investor, sharing the potential information rent in exchange for a favorable report. This is modelled in a hard information setting *à la* Tirole (1992), in which the politician generates a verifiable signal on the project with some positive probability and ensuring her honest behavior requires costly incentive payments. Furthermore, I extend this setting to model the politician choice of the supervision intensity as an effort variable. With the monitoring effort of this politician depending on the potential reward as well as on the potential gains from colluding, the bargaining position of the firm, and thus the final trade-off between FDI and debt, is affected by the level of corruption that prevails.

I then make simple comparative statics when the transaction costs of corruption, taken as a proxy for the level of corruption in a given environment, vary. Again, its effect goes counter that of commitment, i.e. more corruption appears to favor debt. The difference, however, is that now it is effective through its interaction with the risk of expropriation.

1.2 Related Literature

There is a vast literature on foreign investment in the presence of institutional constraints like political risk. Eaton and Gersovitz (1984) first analyzed the level and type of foreign direct investment under the risk of expropriation, and introduced the idea that intangible assets would limit the host country's incentives to expropriate the investment. Doyle and Van Wijnbergen (1994) consider the rationale for tax holidays for foreign multinational firms in a sequential bargaining framework, and Thomas and Worrall (1994) endogenize the size of the direct investment and examine its dynamic behavior when investors are bound to rely on self-enforcing contracts. Relatedly, Bond and Samuelson (1989) propose a two-period model in which the level of commit-

ment of the host country is endogenized, and the firm can respond by altering the capital intensity of its investment. These contributions share the characteristic that they study the amount, input structure and timing of FDI when faced with institutional constraints, but do not consider alternative ways of transferring capital.

Albuquerque (2003) extends Thomas and Worrall's framework to allow precisely for different types of investment (FDI or portfolio flows) and the possibility of exogenous termination of contracts. Assuming the inalienability of part or all of FDI investments, coupled with the imperfect enforcement of international financing contracts, his model reaches two main conclusions. First, financially constrained countries, which empirically can also be seen as the ones characterized by higher political risk, get a higher share of FDI. Second, FDI commands a lower default premium and is thus less volatile than other type of flows. Similarly, Schnitzer (2002) looks at the trade-off between FDI and debt in the presence of sovereign risk and finds that FDI is more likely to prevail when it allows for a better exogenous external option, the project is risky and the foreign investor has a greater efficiency advantage in running the project[11].

Recognizing the pivotal role of the risk of expropriation, the present paper starts from a simple model yielding a conclusion similar to Albuquerque (2003), namely that FDI is more likely in the context of higher political risk. The common building block leading to this similarity of results is the inalienability of part of the direct investment, or equivalently the existence of an outside option for this type of investment in case of expropriation, although to keep the model tractable when introducing corruption, I rely on a simpler incomplete contract model of political risk, maintaining in particular the probability of expropriation fixed. The paper then goes on to model explicitly the impact of corruption on foreign investment. Specifically, it presents theoretical approaches to the two types of corrupt behavior discussed above, bureaucratic petty corruption and high-level political corruption. In doing so, it fills a gap since the existing theoretical literature has not yet explicitly modeled corruption as part of the ownership decision in international investment, despite mounting empirical evidence that corruption is one of the factors seriously affecting the conditions facing foreign investors.

Concerning the empirical analysis of the composition of capital flows in relation to institutional characteristics, related results are found, among others, in Albuquerque (2003), Hausmann and Fernández-Arias (2000), Wei (2000),

[11]Related contributions include Janeba (2002), Goldstein and Razin (2002), Fosfuri (2000), Kraay, Loayza, Serven and Ventura (2004) and Tirole (2003), among others. They are discussed in more details further on, while developing the model.

Wei and Wu (2000), Henisz (2000) and Smarzynska and Wei (2000). The first two papers are based on cross-country regressions similar to the ones I perform and reach similar conclusions. Hausmann and Fernández-Arias (2000) conclude: "Hence, a larger share of FDI in capital flows is typical of countries that are poorer, more closed, riskier, more volatile, more distant, less financially developed, with weaker institutions and with more natural resources." I broadly coincide with this assessment, although I find some of the variables mentioned not to be significant. As for the paper by Wei and Wu (2000), its main conclusion is that "corruption in a capital-importing country tends to tilt the composition of its capital inflows away from foreign direct investment and towards foreign bank loans." This study relies, however, on a different sample and data set. It is based on bilateral capital flows data from 13 developed countries to 30 less developed one, thus obviating more developed countries as recipient. Furthermore, debt flows are restricted to bank lending statistics. Smarzynska and Wei (2000), using firm-level data for Eastern Europe and the former Soviet Union, also find that corruption makes firms prefer a mode of entry based on a claim with less control rights (licensing). The conclusion of the illustrative empirical section of this paper is similar to the previous literature, i.e. corruption reduces the proportion of FDI in capital flows. New is the focus on two types of corruption and the evidence on different channels through which it operates, in particular regarding the interaction between country risk and political corruption.

Section 2 presents the simple model of the trade-off between FDI and debt with credit constraint and lack of commitment and Section 3 introduces asymmetric information and the two types of corruption in this framework. Section 4 then presents the empirical evidence, and Section 5 concludes.

2 The Model

2.1 Basic Setting: Debt vs. FDI with Credit Constraint and Lack of Commitment

I consider the following three period model. Consider a country L, in which local firms produce a good (or service) with a constant return to scale technology of marginal cost c_L. This good is consumed by local consumers who have a downward sloping demand function.

This technology happens to be a relatively inefficient one: As a result of investment in R&D and long term experience in managerial best practice, a foreign firm F has developed an alternative technology which allows it to produce the same good at a lower marginal cost c_F. Technology here must

be understood in the broad sense of technical as well as managerial and commercial capacity.

Assume for simplicity that exporting to L is not an option because of the nature of the product (e.g. telecommunication services) or for transport costs reasons[12]. Both country L and the firm F, however, have an interest in introducing the improved technology to L's interior market.

F has increasing returns to scale, due for example to a large fixed investment in the development of the technology, and wants to expand its activity.

As for country L, first it obviously benefits from increased competition, thus higher consumer welfare. One possible scenario is the opening of a formerly state-owned sector to private foreign firms. Second, the introduction of a better technology has positive spillovers on the domestic industry, which becomes more efficient over time[13]: While in the first period the indigenous producers compete with their low cost technology (c_L), the contact with F allows them to upgrade their own technology and to produce in period 2 at a lower marginal cost c_{LS}.

The subscript t = 0 ,1 ,2 refers to time, with:

- t = 0, the benchmark situation in country L, with only indigenous producers of cost c_L.
- t = 1, the situation in L when the improved technology (c_F) is first introduced and competes with high cost producers (c_L).
- t = 2, the situation in L when the improved technology (c_F) competes with local producers who have benefited from technological spillovers (cost $c_{LS} < c_L$).

In each period t = 0 to 2, aggregate welfare is given by $W_t = S_t^C + \Pi_t^L + \Pi_t^F$, where Π_t^L (resp. Π_t^F) is the profit of firms using the "local" (resp. "foreign") technology, and S_t^C denotes consumer surplus.

Assuming there is no discounting, the net benefit of the introduction of the technology is thus given by[14]:

[12] The model could be extended to consider an initial situation in which the firm exports to country L, without modifying the principal insights. See Fosfuri (2000) for a model where the firm's choice extends to servicing the foreign country by exporting.

[13] See Blomström and Kokko (1996) for an extensive discussion of spillovers arising from the operations of multinational corporations abroad.

[14] We can also disentangle the competition and the technological effects, by writing $G = (W_1 - W_0) + (W_2 - W_1) + (W_1 - W_0) = 2(W_1 - W_0) + (W_2 - W_1)$. The increase in welfare due to the change in the competitive structure of the market, which accrues in both periods, is $W_1 - W_0$ and the increase in welfare due to the technological spillover between period 1 and 2 is $W_2 - W_1$. For simple downward sloping demand functions, it is easily shown that G, the sum of both effects, is always positive, although the technological

$$G = (W_1 - W_0) + (W_2 - W_0)\,. \tag{1}$$

I assume that the parties are risk neutral and that the surplus is divided among them according to a Nash bargaining process[15]. Although at this stage I can just compute the outcome in terms of cooperative game theory, it is useful to introduce the extensive game form corresponding to the Nash bargaining solution that I will extend later to the asymmetric information case. The following three stage complete information game, which exactly implements the Nash solution, is a simplified version of Howard (1992), proposed by Osborne and Rubinstein (1994).

This game form has the advantage of being simple and thus easily extendable to an asymmetric information setting. In the present context I propose an intuitive interpretation, which runs as follows.

The game is a simple three-stage alternated offers bargaining. The first mover (the country) offers a possible agreement $Y = (y_1, G - y_1)$. The second mover (the firm) responds to this offer by a counteroffer $X = (x_1, G - x_1)$ and a threat to terminate the negotiation. Ex ante, the multinational firm's position runs as follows: "Given your offer, I will quit with probability $1 - p$ (thus an *ex ante* threat). Furthermore, if negotiation continues and you don't accept my counteroffer X and insist in implementing Y, there is a probability $1 - p$ that I will decline any agreement."

The mechanism which leads the players to choose the Nash solution is quite intuitive: any initial offer which fails to propose this solution can be met with a "punishment" that leaves the initial player worse off than when he proposes an equal splitting of the pie. This is because if $y_1 > \frac{G}{2}$, the firm has the possibility to choose a probability $p < 1$, so that the negotiation ends with a strictly positive probability. Faced with this threat, it is the country's best strategy to offer the Nash solution and the firm agrees to this choice by choosing $X = Y$ and $p = 1$. Of course, the country would never choose $y_1 < \frac{G}{2}$, since the firm would again choose $X = Y$ and $p = 1$. (see Appendix 1 for a complete resolution of the game under complete and incomplete information).

In a world of complete contracting, the firm would simply sell the blueprint of the technology to country L, based on its total value. From now on, I call this the "Debt" option, in the sense that the country (or some local firm) simply contracts debt to buy the technology and the necessary inputs

effect may be negative for certain extreme values of the parameters. We do not need to consider any specific functional form for the development of the model and simply use the fact that higher spillovers imply a higher global value of the project (see below).

[15] We discuss below the relevance of bargaining as a modeling tool in the present context.

to make it work (machines, management), possibly collateralized by its expected gain from this acquisition, and sets up a locally owned firm endowed with the new production process.

I assume that the parties bargain over the total value of the project. There are several reasons why bargaining can be considered a reasonable modeling option for foreign investment. In a context in which countries strongly compete to attract investors, the discussions that are often conducted by firms with one or more governments can indeed be considered as a bargaining game. There is such anecdotal evidence, for example in the case of car makers looking to establish themselves in developing countries (Tsuge and Bartels, 2003). Considering the potential gains from the investments, both firms and governments bargain over a whole array of items to define a distribution of the benefits (see Moran, 1998). On the side of the firm, these include tax holidays, subsidies and other supporting measures like the financing of infrastructure relevant to the future plants, e.g. roads, electricity or phone lines. On the side of the government, different types of requirements are routinely used as a way to try to capture more of the benefits, for example domestic-content, export-performance, joint venture, and technology licensing requirements. The bargaining approach has been adopted by part of the literature, including Bond and Samuelson (1989) and Doyle and Van Wijnbergen (1994), who show that tax holidays can emerge as the result of a sequential bargaining framework. More fundamentally, the relevance of bargaining can be linked to the necessary incompleteness of contracts involving sovereign parties (see Eaton and Fernandez, 1995, on sovereign debt). Although the analysis of self-enforcing contracts is important from a positive point of view and has provided fundamental improvements in our understanding of capital flows (see references in the introduction), the actual occurrence of expropriations and renegotiations gives the indication that, for some reasons, parties find it hard to rely on such contracts.

The status quo payoffs of the parties, if the negotiation is abandoned and the investment is not realized, are simply 0, so that the surplus G will be split in the following way:

$$U^L_{DEBT} = U^F_{DEBT} = \frac{1}{2}G. \tag{2}$$

Alternatively, the firm may choose to engage in FDI. In this case, it will have to pay in period 1 a sunk cost K. This cost is linked to the need to find and negotiate with local partners and counterparts, to deal with local bureaucrats, and to the investment in local physical and managerial assets (construction of a new plant, adaptation to different business conditions, etc.). It is greater than it would be for the host country (or some local

investor) who has better knowledge of local conditions and, by definition, better access to the local administration. On the other hand, the firm keeps the property-right over the technology. For simplicity, I assume that both the efficiency of the new firm in the host country and the resulting spillovers for the local industry are the same regardless of the way the technology is introduced[16]. As before, the firm bargains with the host country over a share of the benefits generated by its entry, now equal to $G - K$. With the same status quo payoffs as before, it comes:

$$U^L_{FDI} = U^F_{FDI} = \frac{1}{2}(G - K). \tag{3}$$

Hence, in a world with perfect information and no commitment problems, debt is always more efficient.

This result relies, however, on a number of disputable assumptions, such as perfect access to financial markets for the host country, and absence of strategic default. In fact, the total value of the introduction of new technology being of high magnitude, country L is likely to be credit constrained in international markets. In this case, a possible alternative is for the firm to sell its technology against the promise of partial payments in each period, according to the realization of benefits. With a similar bargaining process, the outcome in each case is the same as before, divided in two successive parts. Calling $G_1 \equiv W_1 - W_0$ and $G_2 \equiv W_2 - W_0$, the surplus from a debt contract is shared in each successive period, so that global payoffs are as follows:

$$U^L_{DEBT} = U^F_{DEBT} = \frac{1}{2}G_1 + \frac{1}{2}G_2, \tag{4}$$

while in the case of FDI, they are

$$U^L_{FDI} = U^F_{FDI} = \frac{1}{2}(G_1 - K) + \frac{1}{2}G_2. \tag{5}$$

If the risk of contract repudiation exists, as it does in most of the world, this option may however be plagued by a commitment problem. Country L may indeed renege on its commitment at the beginning of the second period and force a renegotiation. This is represented here by an exogenous probability γ of expropriation, corresponding to the risk of repudiation of

[16] As for the efficiency of the organization resulting from the debt option vs. that of the FDI option, the comparison is a priori ambiguous. On the one hand, a subsidiary may benefit from specific spillovers from the parent company, that would not accrue to a locally owned firm. On the other hand, local entrepreneurs may benefit from better knowledge and information about the business conditions in their country (see Schnitzer, 2002). The comparison of spillovers in both cases is thus also ambiguous.

contracts by country L. To justify this, suppose that the host has the ability to commit in the short run, but that no long term commitment is possible. Considering for example that each period of the model lasts for several years, the assumption of imperfect long term commitment arises naturally from possible changes at the head of government or other shifts in the environment.

Before moving on, it is useful to discuss briefly the form that this repudiation may take with a debt and with an FDI contract respectively[17]. In case of debt, it is straightforward to consider that the country simply defaults with probability γ and forces a renegotiation in which the firm has a status quo utility level of zero, thus appropriating the whole surplus.

In the case of FDI, the situation is slightly more complex. First, the investor faces the risk of outright expropriation or nationalization of the productive assets. The consequence is the same as with the repudiation of the debt contract, since the foreign firm is left with a status quo payoff of zero in period 2. Second, it is exposed to a more subtle form of expropriation, in which the host country manages to capture the rents generated by the subsidiary through specific actions like modifications of the tax schedule or tariff duties[18]. In this case, the firm keeps the property rights over the subsidiary and can react by taking actions that allow it to retain a certain stream of profit, for example shifting some of its subsequent production back to another international location or through accounting gimmicks[19]. The firm, being potentially able to recover a fraction of its second period profits, has a better position in the subsequent renegotiation[20]. Thus, with FDI I

[17] An early model of FDI expropriation is Eaton and Gersovitz (1984). As stated there, to have expropriation actually occurring, there must be some randomness, which is resolved between the time of investment and the expropriation decision. Otherwise, in a deterministic setting, investors simply refrain from doing investment that they anticipate will be expropriated, so the effect is on the size of investments but expropriation never occurs. In a multicountry world, the commitment problem becomes even worse, as we would have to take into account the possibility that the host country, once it has acquired the technology, may resell it to a third party, thus capturing some of the firm's future rents. This problem would obviously shift the trade-off against debt and in favor of direct investment. Its analysis would however require a more complex model, so we abstract from it in the present version. Another related issue is imitation (Fosfuri, 2000).

[18] This involves common agency issues, as policy decisions depend on the FDI-debt choices of many firms (see Tirole, 2003).

[19] If some of the local subsidiary's production is effectively shifted to a different location in period 2, the value of G_2 itself might change. The following results would however not be modified substantially, so we abstract from this additional complication to keep the model tractable when introducing asymmetric information and corruption.

[20] See Schnitzer (2002) for a more detailed discussion and a model where both cases of expropriation and an exogenous outside option for FDI are considered. Janeba (2002) endogenizes this outside option by considering that firms may invest simultaneously in

simply assume that the foreign firm and the host country anticipate that the firm will retain a fraction of its second period profits equal to $\theta\Pi_2^F$, where $\theta < 1$.

To sum up, I assume that both with debt and FDI, bargaining is over the whole surplus and expropriation arises with the same positive probability[21] γ, followed by a renegotiation at $t = 2$ in which the status quo levels depend on the ownership structure. Note that we keep the probability of expropriation exogenous to maintain the basic model as tractable as possible and concentrate on the modeling of corruption, which is the main focus of the paper.

Now, with a positive probability that the country reneges on its commitment in period 2, the timing of successive events is shown in Figure 1.

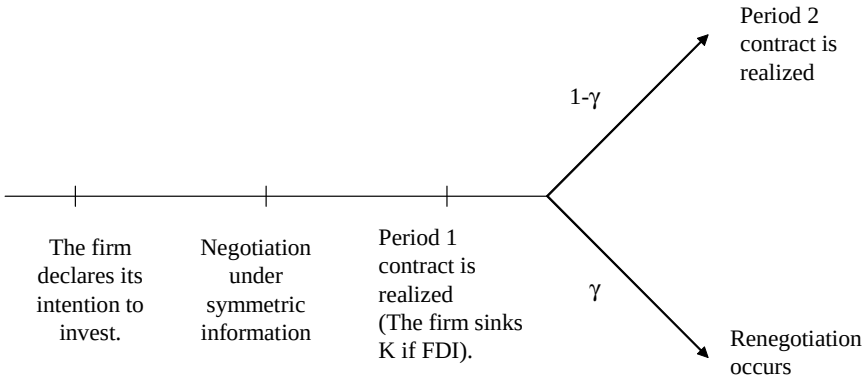

Figure 1: Timing when renegotiation is possible

The outcome of the bargaining process becomes the following. In case of debt, the first period surplus G_1 is divided evenly, while in the second period in case of renegotiation the firm gets nothing with probability γ, hence:

$$\begin{aligned} U_{DEBT}^L &= \frac{1}{2}G_1 + \frac{1}{2}(1+\gamma)G_2 \\ U_{DEBT}^F &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_2. \end{aligned} \tag{6}$$

two countries and use the threat to shift production from one to the other as a disciplining device for governments.

[21] One way to endogenize the probability of expropriation would be to allow the firm to chose the quality of the technology it transfers (see Fosfuri, 2000, and Bond and Samuelson, 1989). Alternatively, one could assume that expropriation occurs only when $G_2 - \theta\Pi_2^F > \frac{1}{2}G_2$. In this case, the results of the paper would be qualitatively unaltered. While all these potential extensions are interesting in their own right, we are not pursuing them here.

In case of FDI, following the discussion, at the beginning of period 2 the status quo payoffs of the firm and the host country are $\theta\Pi_2^F$ and $G_2 - \theta\Pi_2^F$ respectively. The outcome in this case is:

$$\begin{aligned} U_{FDI}^L &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1+\gamma)G_2 - \gamma\theta\Pi_2^F \\ U_{FDI}^F &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_2 + \gamma\theta\Pi_2^F. \end{aligned} \tag{7}$$

Looking at the trade-off faced by the firm between the debt and the FDI option, it is straightforward to see that:

$$FDI \succ Debt \Leftrightarrow \gamma\theta\Pi_2^F - \frac{K}{2} > 0. \tag{8}$$

This simple equation shows that now debt is not always preferred by the firm and provides a key prediction, namely that a higher risk of repudiation makes FDI more likely[22]. Moreover, the trade-off is more favorable to FDI, the greater the share θ of second period profits that can be recovered in case of contract repudiation, the greater Π_2^F, which is the case when the spillovers are of small magnitude, and the lower the sunk cost K. This simple setting is thus consistent with the literature on political risk discussed in the introduction, as well as basic empirical evidence on technological transfers[23].

In the next section, I analyze how this trade-off is affected by the possibility of corruption.

3 Corruption

In a situation where the foreign firm has developed some specific technology or know-how, it is natural to assume that it has private information concerning its exact characteristics. I model this by assuming an asymmetry of

[22] Note that more sophisticated mechanisms could be envisioned, for example frontloading the firm's share in period 1 in case of debt to push it to choose this type of involvement more often. This would amount to endogenizing the parties' bargaining weights. Again, we do not pursue this line and concentrate on the issue of corruption.

[23] As for additional aspects, Markusen (1995) reports that most empirical studies support the view that the internalization of technological transfers (i.e. FDI) is more likely for R&D intensive firms with new and technically complex products. If we take the view that this type of production is characterized by relatively low potential spillovers, because the complexity of its products implies a less intensive linkage with domestic suppliers (which seems to be one key factor for the transmission of externalities, see Blomström and Kokko (1996)), this piece of evidence fits well within our framework.

information on the level of spillover that the introduction of the technology would generate, which are known to the firm but not to the host country.

Assume that the net benefit can take two values G_S and G_W, such that $G_S > G_W$, with the notation[24] $\Delta G = G_S - G_W$. The subscript S (resp. W) stands for strong (resp. weak) spillovers and can be said to correspond to the "good type" (resp. "bad type") project. The host country has previous beliefs about the realization of G given by:

$$\begin{aligned} \Pr(G &= G_S) = \nu \\ \Pr(G &= G_W) = 1 - \nu. \end{aligned}$$

3.1 The Nash Solution with Asymmetric Information

To see the implication of the asymmetry of information for the bargaining problem, consider again the extensive game form introduced above. When one of the players has private information about his type, it obviously matters whether the informed party moves first or not. To avoid the multiplicity of equilibria inherent to a signaling game, and to keep the model as tractable as possible, I stick to the case where the uninformed party (the host country) moves first. The timing of the bargaining procedure is the same as under symmetric information, with the only difference that now, when choosing y_1 at the beginning of the game, country L does not know the true value of G and acts in such a way that its expected payoff is maximum. The complete resolution of the subgame perfect Nash equilibrium of this extensive game is in Appendix 1.

Again, what happens is intuitively clear. If the country chooses $y_1 = \frac{G_W}{2}$, the complete information solution (thus the Nash solution) is implemented with probability $1-\nu$ (when $G = G_W$), but with probability ν (when $G = G_S$) it incurs a loss since its initial offer is less than $\frac{G_S}{2}$.

On the other hand, if the country's initial offer is $y_1 = \frac{G_S}{2}$, the complete information solution is now implemented with probability ν (when $G = G_S$), but with probability $1 - \nu$ (when $G = G_W$) the offer is too high and the firm replies with $p = \frac{G_W}{G_S}$ and $x_1 = \frac{G_W}{2}$, so that the country suffers a loss with respect to the Nash solution. Note that in this case both parties are worse off than under complete information. This global loss of efficiency is typical of such situations of bargaining under asymmetric information.

[24] Since we assume the uncertainty to be about the potential spillovers in the host industry, the distinction between a good type and a bad type project will only be relevant in period 2, when the spillover effect takes place. Thus, the benefit of the project can be divided in its two period components: $G_S = G_1 + G_{2,S}$ and $G_W = G_1 + G_{2,W}$, so that $\Delta G = G_S - G_W = G_{2,S} - G_{2,W} = \Delta G_2$ and $\Delta G_1 = 0$.

Furthermore, it is shown in the appendix that an intermediate value of y_1 is never optimal, as the country's payoff is a convex function of y_1, so that depending on the value of the parameters, the best choice of y_1 is given by either $y_1 = \frac{G_W}{2}$ or $y_1 = \frac{G_S}{2}$.

Table 1 summarizes the outcome of the game for different values of the parameters.

Table 1: outcome of the bargaining game with asymmetric information.

	$\nu \leq \frac{G_W}{G_S+G_W}$	$\nu > \frac{G_W}{G_S+G_W}$
	Host country: $y_1 = \frac{G_W}{2}$	Host country: $y_1 = \frac{G_S}{2}$
MNE (G_S)*	$(\frac{G_S}{2} - \frac{\Delta G}{2}, \frac{G_S}{2} + \frac{\Delta G}{2})$	$(\frac{G_S}{2}, \frac{G_S}{2})$
MNE (G_W)**	$(\frac{G_W}{2}, \frac{G_W}{2})$	$(\frac{G_W^2}{2G_S}, \frac{G_W^2}{2G_S})$

* $x_1 = y_1$, $p = 1$ (both when $y_1 = \frac{G_W}{2}$ and $y_1 = \frac{G_S}{2}$).
** $x_1 = y_1$, $p = 1$ (if $y_1 = \frac{G_W}{2}$); $x_1 = \frac{G_W}{2}, p = \frac{G_W}{G_S}$ (if $y_1 = \frac{G_W}{2}$).

I now consider how the different types of corruption introduced above will affect the FDI-debt trade-off[25].

3.2 Story 1: Bureaucratic Corruption

Consider a situation in which local bureaucrats are in charge of attributing licenses to firms, for example authorizing imports of specific inputs or delivering health and safety certificates. As discussed in the introduction, these low-level officials are unlikely to be have any detailed information on the firms they deal with. Instead, I will characterize this type of petty corruption by assuming that in period 2, they ask the firm that has chosen FDI for a fixed bribe B in order to issue the relevant license[26]. This does not mean that local firms are not themselves subject to bribes, but that foreign firms are better

[25] Ex ante, investors have superior information on the quality of their project. This is true irrespective of the type of ownership chosen and thus in particular in the case of "debt". Alternatively, a corporate finance perspective on the nature of debt is likely to put emphasis on the fact that debtors would enjoy superior information on some aspects of the contract. However, the contradiction is only apparent. As will become clear below, FDI does generate an additional informational edge for investors in case of renegotiation. Thus, in relative terms, debtors do know more about the claim (or, to say it otherwise, they are a lesser informational disadvantage) in case of debt. Other types of asymmetries could be envisioned, for example about local demand conditions (in which case the government could be the one having private information). In this case, a similar relative effect would hold and debtors would indeed enjoy the stronger informational advantage in the case of debt.

[26] See Banerjee (1997) for a model in which government officials create red tape and delays in the attribution of a publicly provided service in order to extract bribes.

targets for corrupt officials, because of their relative ignorance of the local rules and their lack of personal connections for example. Note that I distinguish the (ex post) bribe B from the (ex ante) fixed cost of implantation K.

Furthermore, I assume that, upon asking for a bribe, bureaucrats risk being detected and punished with probability $\tau(B)$, with $\tau' > 0$ and $\tau'' \geq 0$. One explanation is that the firms' willingness to denounce corrupt demands is an increasing function of the amount of the bribes. In the limit, a firm faced with a demand equal to or exceeding its total profits would have nothing to loose from denouncing the corrupt deal and the probability of punishment would approach 1. Alternatively, huge bribes are simply more difficult to hide, because they involve observable transfers of wealth or, as is commonly observed in developing countries, they result in public employees enjoying acquisitive power beyond what their salaries would permit. These cases are thus more likely to draw the media attention and be brought to light.

Accordingly, bureaucrats choose B by maximizing a return function of the type (which implicitly assumes they have limited liability):

$$\max_{B} \left(1 - \tau(B)\right) B.$$

Cross-country comparisons are simply derived by assuming that, for a given level of bribe, the probability of detection is lower in a more corrupt environment. Straightforwardly, in a context more prone to corruption, the above maximization problem leads bureaucrats to formulate higher bribe demands.

In order to see how bureaucratic corruption affects the trade-off between FDI and debt, first consider the complete information case. Clearly, the prospect of giving away an amount B does not modify the status quo of the firm when faced with an attempt of expropriation, which in any case is given by $\theta\Pi_2^F$. However, note that when $B > \frac{1}{2}(1-\gamma)G_2 + \gamma\theta\Pi_2^F - \theta\Pi_2^F = (1-\gamma)\left[\frac{1}{2}G_2 - \theta\Pi_2^F\right]$, the bribe exceeds the firms profits minus its outside option, so it will choose to leave the country[27]

The firm's payoffs to engage in FDI and debt respectively are then given by:

[27] While the empirical literature mostly focuses on how corruption may keep investors away from specific countries, stories of foreign investors forced to leave by excessive corruption make regular headlines in developing countries. This will be the case if myopic bureaucrats place demands such that they extinguish the source of the bribe. If firms anticipate the level of B as in the present framework, this would never happen, as they would just refrain from choosing FDI. However, one can envision unexpected ex post shocks leading to an increase in corruption, so that firms that have chosen FDI are pushed toward the exit.

$$
\begin{aligned}
U^F_{FDI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_2 + \gamma\theta\Pi^F_2 - B \text{ if } B \leq \frac{\left[\frac{1}{2}G_2 - \theta\Pi^F_2\right]}{(1-\gamma)}, \\
&= \frac{1}{2}(G_1 - K) + \theta\Pi^F_2 \qquad \text{otherwise.} \\
U^F_{DEBT} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_2.
\end{aligned}
$$

The trade-off then becomes:

$$
\begin{aligned}
FDI \succ Debt &\Leftrightarrow \gamma\theta\Pi^F_2 - \frac{K}{2} - B > 0 \text{ if } B \leq \frac{\left[\frac{1}{2}G_2 - \theta\Pi^F_2\right]}{(1-\gamma)}, \\
&\Leftrightarrow \gamma\theta\Pi^F_2 - \frac{K}{2} - \frac{1}{2}(1-\gamma)G_2 > 0 \text{ otherwise.}
\end{aligned}
$$

When the tolerance for bureaucratic corruption, and thus the expected bribes, are high enough, the marginal effect on the ownership decision disappears. Moreover, if γ is not too large, $\frac{(1-\gamma)}{2}G_2 > \gamma\theta\Pi^F_2$, and debt always dominates.

Under asymmetric information, the results are quite similar. Consider first the case $\nu \leq \frac{G_W}{G_S+G_W}$. With FDI, The firm's second period surplus is given by $\frac{1}{2}(1-\gamma)(G_{2,S} + \Delta G_2) + \gamma\theta\Pi^F_{2,W}$ for a good type firm, and by $\frac{1}{2}(1-\gamma)G_{2,W} + \gamma\theta\Pi^F_{2,W}$ for a bad type one.

We can directly write the FDI-debt trade-off in the three possible cases:

- If $B \leq \underline{B} \equiv \frac{1}{2}(1-\gamma)G_{2,W} + \gamma\theta\Pi^F_{2,W} - \theta\Pi^F_{2,W}$, bureaucrats are able to extract bribes from both types of firms and we get:

$$
FDI \succ Debt \Leftrightarrow \gamma\theta\Pi^F_{2,W} - \frac{K}{2} - B > 0. \tag{9}
$$

- If, on the other hand, $\underline{B} \leq B \leq \overline{B} \equiv \frac{1}{2}(1-\gamma)(G_{2,S} + \Delta G_2) + \gamma\theta\Pi^F_{2,W} - \theta\Pi^F_{2,S}$, the bribe exceeds the bad type firm's profits minus its outside option, and it is only paid by the good type one. Then:

$$
\begin{aligned}
& FDI \succ Debt \\
\Leftrightarrow\ & \nu\gamma\theta\Pi^F_{2,W} - (1-\nu)\left[\frac{(1-\gamma)G_{2,W}}{2} - \theta\Pi^F_{2,W}\right] - \frac{K}{2} - \nu B > 0.
\end{aligned} \tag{10}
$$

- Finally, if $B > \overline{B}$, bureaucrats completely extinguish the potential source of bribe and:

$$\begin{aligned} FDI &\succ Debt \\ &\Leftrightarrow \nu\theta\Pi^F_{2,S} + (1-\nu)\,\theta\Pi^F_{2,W} \\ &\quad -\frac{(1-\gamma)}{2}\left[\nu\left(G_{2,S}+\Delta G_2\right)+(1-\nu)\,G_{2,W}\right]-\frac{K}{2} > 0. \quad (11) \end{aligned}$$

Interestingly, we get that corruption favors a shift toward debt but, as the proneness to corruption increases, the marginal effect is decreasing and eventually vanishes[28].

Alternatively, it could be assumed that although bureaucrats are unable to generate a signal on the true type of the firm, they share the common knowledge belief on the value and distribution of its profits. The maximization problem would be restated as:

$$\max_B \left(1-\tau(B)\right)\left[\mathbb{I}_{\left[B\leq\overline{B}\right]}\nu B + \mathbb{I}_{[B\leq\underline{B}]}\left(1-\nu\right)B\right],$$

where $\mathbb{I}_{[.]}$ is the indicator function taking value 1 if the statement in brackets is true and 0 otherwise. In this case corrupt bureaucrats would never ask for a bribe $B > \overline{B}$, and the analysis would be restricted to the first two cases above. The marginal effect of corruption would again be decreasing but would stay positive even in very corrupt environments. Although anecdotal evidence seems to favor the first approach, in which petty bribers are totally myopic and firms may eventually be forced to exit the country, this is ultimately an empirical matter. I summarize the results of this section in the following proposition.

Proposition 1 *Petty bureaucratic corruption, in which low-level public officials uninformed about firms' true profitability place fixed bribe demands, shifts the trade-off of incoming investors toward debt. Moreover, the marginal effect of this type of bribery is decreasing in the prevailing level of corruption, and may even become equal to zero if bureaucrats don't know the true distribution of firms' type.*

The simple intuition driving this result is that bureaucratic corruption acts as a tax on FDI, thus making debt more desirable. However, if expected corruption exceeds some threshold, debt always dominates and corruption has no marginal effect on the ownership decision of foreign investors.

[28] Note that when $\nu > \frac{G_W}{G_S+G_W}$, the three expressions for the trade-off are slightly modified but the marginal effects and the conclusions are strictly similar, so we do not present the results to save space.

3.3 Story 2: Political Corruption

Because of the asymmetry of information, the host country is giving up a rent to the investing firm. As the bargaining game takes place, a high-ranking official (I refer to her as "politician" in what follows) has the opportunity to extract information on the true type of the firm.

As discussed in the introduction, I take the view that the politician is under an (eventually implicit) contract with a principal (the people themselves or the highest tier of government) maximizing some welfare objective function. The position of the politician gives her access to information not directly verifiable by the principal.

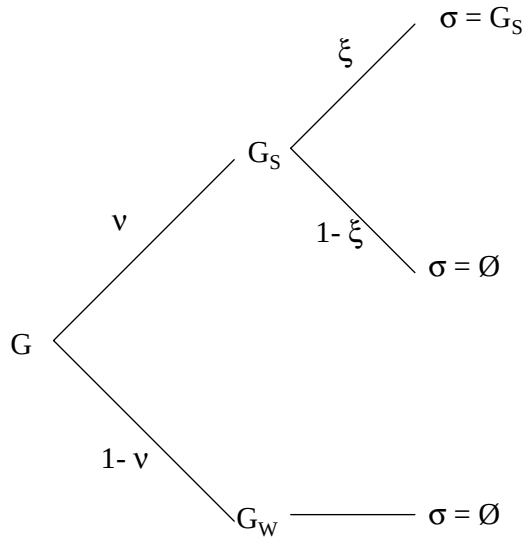

Figure 2: Information Structure

Formally, consider a supervision technology à la Tirole (1992), where the politician receives with some positive probability ξ a verifiable signal σ on the good type investor (see Figure 2). To the extent that the politician pursues her own interest, she has an incentive to collude with the foreign firm to capture some of the information rent.

Collusion only occurs when $\nu \leq \frac{G_W}{G_S+G_W}$, which is the only case where the investor enjoys an information rent, so I shall therefore concentrate on this case[29]. When the politician detects a good type project of value G_S (which

[29]It is easily shown that with the information structure postulated above, when $\nu > \frac{G_W}{G_S+G_W}$, the introduction of asymmetric information and the politician intervention have no effect on the trade-off between FDI and debt (see Appendix 2).

happens with probability ν), she may collude with the firm to report the project of being of the bad type (G_W), and share the surplus $\frac{1}{2}\Delta G$.

If collusion occurs, I assume that the politician has all the bargaining power and gets the whole surplus.[30] Moreover, when the firm transfers an amount t, the politician receives only kt, where the deadweight loss parameterized by k ($k \leq 1$) corresponds to the transaction cost of collusion[31]. Thus, to prevent collusion, the politician needs to receive an incentive payment $s = k\frac{1}{2}\Delta G$ when she reveals a good type project.

The timing of the events is given in Figure 3.

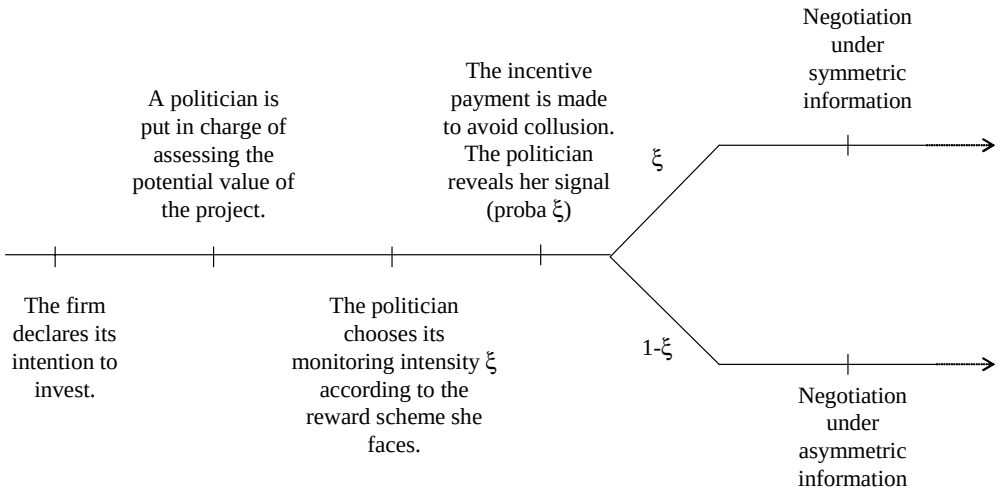

Figure 3: Timing with politician intervention

Consider that in order to have a signal with probability ξ, the politician must exert an effort, which has a disutility $\Psi(\xi)$ ($\Psi'(\xi) > 0, \Psi(\xi)'' > 0$), because, say, it is time consuming and her opportunity cost is high[32]. The

[30] This assumption is made for simplicity. Considering that the politician and the firm get shares of the surplus equal to α and $1-\alpha$ respectively, would not change the following results. Note that while corruption can be seen as affecting primarily the government, any value of α above 0 means that the politician captures part of the firm's rent, so corruption also affects foreign investors.

[31] k can be considered to capture both material difficulties in realizing illegal side payments and psychological traits of the corrupt agents, like their relative honesty or their fear to be caught. See Laffont and Tirole (1991) for a discussion.

[32] In Mookherjee and Png (1995), corruptible inspectors choose their monitoring intensity balancing potential reward, effort cost and penalties. The main difference here is that corruption is rooted in the asymmetry of information, so that the collusion proofness principle holds and corruption never occurs in equilibrium. In our setting, heterogeneity of politicians would be needed to have corruption at equilibrium.

politician is rewarded with a payment r for each dollar that her report allows to recover. She will thus choose a level of effort so as to solve:

$$\max_{\xi} \xi r \frac{\Delta G}{2} - \Psi(\xi). \tag{12}$$

Taking a simple functional form $\Psi(\xi) = \frac{\Delta G}{2}\frac{\xi^2}{2}$ for the purpose of normalization, it comes immediately that $\xi^* = r$.

Anticipating this, the optimal contract with the politician will set the reward r so as to maximize:

$$\max_{r} \xi \frac{\Delta G}{2} - \xi r \frac{\Delta G}{2} = r\frac{\Delta G}{2} - r^2\frac{\Delta G}{2}, \tag{13}$$

where the first term is the gain due to the report occurring with probability ξ, and the second term is the cost of the incentive payment to the politician. Thus, $r^* = \frac{1}{2}$, and an informative report is received with probability $\xi^* = \frac{1}{2}$.

Consider now the case where the politician is potentially corrupt. We have seen that she gets $s = k\frac{1}{2}\Delta G$ if the side contract with the firm is enforced. The maximization program of the politician becomes therefore:

$$\max_{\xi} \xi \left[\max(k, r)\frac{\Delta G}{2}\right] - \Psi(\xi), \tag{14}$$

where the side contract prevails if $k > r$ and a truthful report is made otherwise. The politician will thus choose $\xi^* = \max(k, r)$. Considering this, the optimal r is $r^* = \frac{1}{2}$ as long as $k < \frac{1}{2}$ and $r^* = k$ otherwise. As a result, $\xi^* = \frac{1}{2}$ when $k < \frac{1}{2}$ and $\xi^* = k$ otherwise.

As k increases, i.e. as the environment becomes more prone to corruption because of lower transaction costs, the intensity of monitoring ξ^* will thus also increase.

In this simple informational structure, the collusion proofness principle holds (see for example Tirole, 1992), so it is always profitable to pay the politician in exchange for a hard signal that the project is good[33]. We can now look at the consequences for the trade-off between debt and FDI. Three cases will occur:

- Case 1: with probability $\nu\xi$, the project is good, the politician has a signal G_S, reveals it, and the full information solution is implemented.

- Case 2: with probability $\nu(1-\xi)$, the project is good, the politician has no signal, and the asymmetric information solution prevails.

[33]Like the hidden part of an iceberg, in most societies the number of potential corrupt transactions that are not realized is likely to largely exceed those that are. The true cost of corruption is thus invisible but not less important: It lies in the incentive payments necessary to prevent it.

- Case 3: with probability $1-\nu$, the project is bad, the politician has no signal, and the asymmetric information solution prevails. Note however that this case is similar to the complete information one, since the country offers $\frac{G_W}{2}$ and the firm has no rent anyway.

With two types of project and complete information, the trade-off between FDI and debt is given by:

$$FDI \succ Debt \Leftrightarrow \gamma\left(\nu\theta\Pi^F_{2,S} + (1-\nu)\theta\Pi^F_{2,W}\right) - \frac{K}{2} > 0, \tag{15}$$

where $\Pi^F_{2,S}$ (resp. $\Pi^F_{2,W}$) corresponds to the second period profit of the incoming firm if the spillover is strong (resp. weak). Under asymmetric information, the trade-off becomes (see Appendix 2):

$$FDI \succ Debt \Leftrightarrow \gamma\theta\Pi^F_{2,W} - \gamma\xi\nu\theta\left(\Pi^F_{2,W} - \Pi^F_{2,S}\right) - \frac{K}{2} > 0. \tag{16}$$

Now, when renegotiation happens, with probability $1-\nu\xi$ (the sum of the probabilities of cases 2 and 3 above) the host country is uninformed about the firm's type. In particular, with probability $\nu(1-\xi)$ (case 2), the good type is able to mimic the bad one (remember that we are in the case where $\nu \leq \frac{G_W}{G_S+G_W}$, and thus the government offer is $\frac{G_W}{2}$, which corresponds to a bad type project) and receives an extra gain from negotiating under asymmetric information, thanks to a better status quo position ($\theta\Pi^F_{2,W}$ instead of $\theta\Pi^F_{2,S}$)[34]. Note thus that it is the interaction of the risk of repudiation (which induces renegotiation with a certain probability) and of asymmetric information and potential corruption (which modifies the firm's bargaining position in this renegotiation) that together shift the trade-off. Since $\Pi^F_{2,W}$ is greater than $\Pi^F_{2,S}$, it appears that an increase in the probability ξ that the politician has a signal on the good project, shifts the trade-off marginally toward debt. When the politician chooses the intensity of monitoring according to her potential reward, ξ is higher in a more corrupt environment. The conclusion is then that environments more prone to corruption tend to favor debt relative to FDI[35].

I summarize the insights from this section in the following proposition:

Proposition 2 *An environment more prone to political corruption (lower transaction costs of corruption, thus higher k) shifts the choice of investment*

[34] $\Pi^F_{2,W}$ corresponds to the second period profit of the incoming firm if the spillover is weak, i.e. if the firm retains a greater competitive edge, and is obviously greater than $\Pi^F_{2,S}$.

[35] Similar comparative statics would be obtained with a more complex information structure in which a certain proportion of politicians is corrupt or equivalently the politician is corrupt with some probability.

toward debt. Moreover, the effect of this type of corruption is effective through its interaction with the commitment variable γ.

The intuition is as follows: Asymmetric information gives firms choosing FDI an edge in case of expropriation because they can then pretend to have a higher outside option. The type of corruption that forces firms to share information rents with politicians thus also reduces their incentive to chose this organizational form. Technically, under asymmetric information, a good type firm choosing the FDI option is able to mimic a bad type in case of renegotiation and obtain a better payoff. On the other hand, it is always profitable to give incentive payments to the politician in charge of bargaining with the firm in order to reduce the asymmetry of information thus limiting the extra benefit arising under FDI in case of renegotiation. The more corrupt the environment, the higher the politician's monitoring effort, the higher the incentive payments and the more often complete information prevails, thus reducing the interest for the good firm to choose FDI, and shifting the trade-off marginally toward debt.

The next section presents some illustrative empirical evidence.

4 Empirical Evidence

4.1 The Data

Foreign Direct Investment as a share of total private capital flows. To measure the relative prevalence of FDI in a country's composition of capital flows, I compute the amount of foreign direct investment, defined in section 1, as a share of total private capital flows, consisting of private debt (commercial bank lending, bonds, and other private credits) and non-debt flows (FDI and portfolio equity investment), using gross inflows data from the IMF's International Financial Statistics Database[36]. I use average log values for three successive periods: 1985-1989, 1990-1994, and 1995-1999, getting cross-country samples of 68, 84, and 92 observations respectively, and an unbalanced panel covering three periods and 106 countries (See in Appendix 3 the list of countries in the sample).

Risk of contract repudiation and corruption. To represent the level of a country specific political risk in the sense of lack of commitment, I employ

[36]The test proposed here, using aggregated capital flows data, must obviously be seen as preliminary. In particular, it might be argued that not all private capital flows have to do with multinational firms' operations (see a robustness check on this below), and conversely that not all private borrowing is recorded as private capital flows, for example when it is secured by a domestic intermediary or a multilateral agency.

an indicator of the risk of government repudiation of contracts, published in the *International Country Risk Guide* by the private firm *Political Risk Service, Inc.* As for corruption, I use the corruption index from the same source. This index is a measure of "corruption within the political system, which distorts the economic and financial environment". Arguably, although different corruption indices are the result of different survey questions, they are likely to be broad measures of the corrupt environment and are indeed generally highly correlated with each other (see Kaufman, Kraay and Zoido-Lobatón, 1999). I thus first use this variable both independently (as a proxy for bureaucratic corruption), as well as interacted with the political risk variable (proxying for political corruption). Alternatively, to account for the concern that it may rather be capturing political corruption, I use an index of bureaucratic quality, from the same source, as a proxy for bureaucratic corruption.

These indices are available for the years 1985, 1990 and 1995 for all the countries in the sample and, for the sake of interpretation, are rescaled from 0 (less risk, least corrupt) to 10 (more risk, most corrupt). I use beginning of the period values to mitigate potential endogeneity problems.

Note that abstraction is made from quantitative and descriptive data on cross-country institutional variations. Apart from the difficulty in obtaining such "objective" data, there are more fundamental reasons to focus on subjective data. First, objective data on corruption cases for example might reflect both the prevalence of corruption, the legal categories of each country, and the effectiveness of the anti-corruption fight (Ades and Di Tella, 1999). Similarly, recorded rates of contract repudiation are subject to both endogeneity (they both cause- and are affected by- the firms' operating mode choices) and measurement error problems (there may be side agreements between firms and governments, while the "creeping expropriation" version is harder to detect). Second, there is a revealed preference argument in favor of subjective indices, in the sense that they capture the perceptions of the agents, which are the relevant decision variables. Finally, it can be argued that such data measure both the intrinsic quality of norms and rules and the efficiency of their enforcement.

Other data[37]. The following control variables are included (again, beginning of the period values are used when applicable): income measured by GDP per capita, the openness of the economy proxied by the ratio of imports to GDP, the size of the economy measured by total GDP, all three (in logs) from the World Bank World Development Indicators; an index of inflation

[37]Part of this data set was kindly provided by the Inter-American Development Bank Research Department.

to proxy for macroeconomic stability (a higher value meaning less inflation), from the Inter-American Development Bank; and a set of time-invariant characteristics, including a measure of the value of the subsoil natural wealth of a country and latitude, from the World Bank.

4.2 Empirical Results

Following the model, I test a specification of the form:

$$\begin{aligned} \text{FDI / total priv. K} \;=\; & \alpha + \beta_1 \text{ risk} + \beta_2 \text{ corruption} \\ & + \beta_3 \text{ risk*corruption} + \beta_4 \text{ control var.} + u, \end{aligned} \quad (17)$$

where β_2 captures what I called the bureaucratic corruption effect, while β_1 and β_3 correspond to the political risk and corruption dimension.

Table 2 shows the basic panel estimations, using the ratio of FDI to total private capital flows as dependent variable. The results support the main conclusions above. The previous literature indicates that time-invariant variables (soil and latitude) are important determinants of the composition of capital flows, but the use of these variables rules out fixed-effect estimation. On the other hand, random effect estimation is not the most suitable option for cross-country data. Consequently, equations 1 to 3 are estimated without intercept[38], while time-invariant variables and regional dummies account for some of the country effects. In columns 4 and 5, fixed effects estimation are performed as a robustness check, excluding time-invariant characteristics and country dummies. In all cases, traditional controls (income, openness, size) are introduced, as well as a full set of time dummies, which are meant to capture some key structural evolutions that affected flows of capital during the period under scrutiny, such as the end of the cold war, the launch of the EU single market and the change of attitude towards FDI in developing countries.

(Table 2 here)

The first observation is that the risk of contract repudiation and its interaction with corruption give results consistent with the model, both variables being of the expected sign and economically significant in all five specifications. For each point increase in the risk index (on a scale from 0 to 10),

[38] Alternatively, imposing a common intercept gives results almost identical to the no intercept case.

corresponding to a higher risk of contract repudiation, the share of FDI in total private capital flows increases by between 3 and 4%, while maintaining that risk index constant, a one point variation in the corruption index has an opposite effect of between 0.5 and 0.8%[39]. We thus get very satisfying support for the political corruption story of the model. Note that looking at political risk, the net marginal effect becomes negative for a value of the corruption index at or above 6 (corresponding for example to the ranking of Guatemala, Sudan or Pakistan in 1995).

As for the direct effect of corruption, it is as expected in columns 1 and 2, where we get a negative and significant coefficient, indicating a marginal effect of around 1.5% for each additional point on the corruption scale of the PRS index. This confirms the idea that corruption has both an indirect effect through its interaction with political risk and a direct one, which I linked to bureaucratic corruption. Moreover, in column 2, I test the possibility of a decreasing direct marginal effect of corruption, by introducing an interaction between this variable and a dummy equal to 1 for a group of low corruption countries[40]. The result supports the hypothesis of a lower marginal effect for more corrupt countries (1.7% against 2.3% for less corrupt ones). To assess the possibility that the cross-country indices may have a limited ability to capture different types of corruption, column 3 presents a similar specification, where the corruption variable is replaced by the bureaucratic quality index and an interaction with a high bureaucratic quality dummy. Results are similar overall (the significance of political risk and corruption actually improves), with a significant and negative bureaucratic effect of around 1% for the group of countries with better institutions[41].

Fixed effect estimations in columns 4 and 5, using the specification of columns 2 and 3, confirm the robustness of the political corruption effect, with again very significant results for both the political risk variable and its interaction with corruption. The magnitude of the marginal effects is unchanged. The significance of the direct effect of corruption is lower, however. In column 4, the interaction with the low corruption dummy yields a negative but insignificant coefficient for the low corruption country group, and so do both the bureaucratic index and its interaction with the high bureaucratic quality dummy. One possibility is that fixed effects indeed capture part of

[39] I obtain similar results when replacing the index of contract repudiation by an average of this index with an index of the risk of investment expropriation.

[40] Different cutoff levels were tested and the one used in Table 2 (corruption index strictly less than 3.33 on the PRS scale) proved the most significant. Around 25% of the countries in the sample are below this threshold.

[41] Those with a value of the index less than 3.33, which includes around 40% of the sample.

the direct corruption effect at the country level, thus resting significance to the corruption and bureaucratic variables.

Note that risk and corruption have important explanatory power, as their inclusion augments the part of the variance explained by the regression (the R^2) by around 15%. Moreover, about half of this effect appears to be conditional on the presence of the soil resources variable, while the soil variable alone fails to rise the explanatory power of the estimations. An intuitive explanation is that this variable captures the effect of natural resources projects (oil, mining), which generally call for direct involvement from multinational firms due to the size of the fixed investment required and political strategic considerations, and are particularly prone to the kind of risk discussed in this paper. This is an interesting result calling for further investigation since the aggregate nature of the data makes it difficult to draw more precise conclusions.

Standard controls, openness, size and level of development, as well as inflation, are not significant in columns 1 to 3, but become significant when allowing for country fixed effects. Richer countries get a higher share of FDI, while the effect of more openness and bigger size are negative. Higher inflation, implying less macroeconomic stability, implies a higher relative share of FDI.

As for invariant characteristics, latitude is significant in regressions 1 to 3. Countries nearer the equator have a higher share of FDI in total capital flows. This variable has a similar effect and performs better than a measure of distance from the world main markets (the correlation coefficient of these variables is -0.70), so I conjecture that it partly captures a location motive (FDI to overcome transport costs). Time dummies for the periods 1985-89 and 1990-94 are negative and very significant, probably indicating the recent change toward a more favorable perception of inward FDI flows.

One potential limitation of this empirical test is that the link between the ratio of FDI to total capital flows and institutional quality variables may be due to the movement of short term capital flows, included in the left hand side variable's denominator, that may be quickly reversed in a scenario of increased institutional uncertainty[42]. To test this hypothesis, Table 3 presents an additional set of estimations, where the dependent variable is the ratio of FDI to private capital flows now excluding portfolio investment flows.

(Table 3 here)

[42]I thank a referee for making this point and suggesting the robustness test below.

The results confirm the previous conclusions regarding political corruption, as the coefficients of the risk of repudiation and the interaction with corruption are again significant and of the correct sign, with values fairly similar in all the specifications tested. A one point increase in the risk index appears to have an average positive impact of between 3.7 and 5.4% on the share of direct investment, while the effect of corruption through its interaction with risk is again about one sixth of the direct effect.

The results on the direct effect of corruption are also similar to those in table 2, although the statistical significance is somewhat lower. While the soil wealth and the inflation variables lose significance, latitude is consistently and significantly negative and the effect of other basic control variables is also unchanged. Overall, the results are little affected by the exclusion of short term capital flows from the dependent variable denominator.

Thus, this preliminary evidence, based on aggregate data, is consistent with the model's predictions. The results strongly support the political corruption story. The direct effect of corruption is also supported by the data, although it appears somewhat less robust. These results are satisfactory given the aggregate nature of the data and in particular the type of institutional indices used, which arguably capture only imperfectly different aspect of institutional quality.

Finally, it is interesting to place these results in the context of the available historical evidence. This seems to indicate that the portfolio-direct composition of private foreign investment has indeed long been sensible to levels of development and risk. Lipsey (1999) refers earlier work showing that "some 44 to 60 percent of the $19 billion of accumulated investment in developing countries in 1913-14 was in the form of direct investment", while, "about 80 percent of the stock of long term investment in the United States was portfolio investment." He then adds that in the United States, foreign portfolio investment went mainly to large and relatively safer investments, while smaller and riskier investments in agriculture or manufacturing were left to local financing or individual foreign direct investors.

5 Conclusion

I have modeled the boundaries of the multinational firm, i.e. the financial structure of its involvement in a foreign country, by looking at a simple trade-off between FDI (internal expansion) and debt (arm's length expansion), and analyzing the effects of institutional constraints in host countries, i.e. problems of commitment and, especially, corruption.

The model starts from the idea that capital flows are more likely to take

the form of FDI when the ability to commit of the recipient is low, because in the case of contract repudiation (default or expropriation), the firm is able to recover a greater proportion of its subsequent profit, for example shifting back some of its production to another location. I have then modelled two different aspects of corruption affecting foreign investment, namely bureaucratic and political corruption. Bureaucratic corruption is shown to favor debt against FDI, with a diminishing marginal effect as corruption increases. As for political corruption, it is effective through its interaction with the risk of repudiation variable and its sign is the opposite of the political risk effect, i.e. it again favors debt. These predictions are broadly supported by cross-country panel empirical evidence.

This obviously challenges the generally accepted view in policy discussions, according to which FDI is always a more favorable kind of external capital for developing countries. Instead, it appears that the quality of institutions has important and complex consequences on the composition of capital flows, the bottom line being that a higher share of FDI might be the sign of underdevelopment and riskiness, rather than attractiveness for foreign investors. From a policy perspective, this analysis suggests shifting the focus from the mere promotion of FDI to the determination of the optimal way to attract foreign capital and technology, given the institutional characteristics of a specific country.

From a theoretical perspective, a possible extension of the present line of research is to integrate, beyond the simple composition effect, the firm's option to invest or not, for example in a multi-country setting where a decision would be taken with respect to the realization and the location of investments. From an empirical perspective, this would give the basis for a more systematic analysis of the effects of institutional characteristics on both the composition and the volume of capital flows.

APPENDIX 1

The extensive game with complete information is represented in figure 4

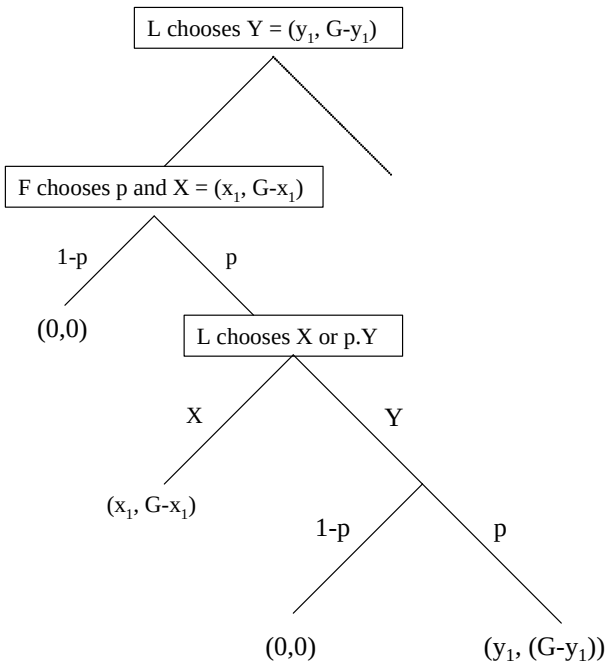

Figure 4: Extensive game with complete information

• In **Stage 1**: Country L proposes a payoff y_1(implicitly a pair $Y = (y_1, G - y_1)$, where $y_1 \leq G$).

• In **Stage 2**: The Firm F replies by proposing a payoff x_1(implicitly a pair $X = (x_1, G - x_1)$, where $x_1 \leq G$), and a probability $p \in [0, 1]$. With probability $1 - p$ the game ends and the outcome is the status quo. With probability p it continues.

• In **Stage 3**: Country L chooses either X or the lottery $p.Y$ (i.e. the lottery giving Y with probability p and the status quo with probability $1-p$). Its choice is the outcome.

Analyzing the game backwards, in stage 2 the firm chooses p (under the constraint $p \leq 1$)and x_1 so as to maximize its final payoff, which is given by either $pp(G - y_1)$, if country L chooses $p.Y$, or $p(G - x_1)$ if the country's choice is X. Formally, the firm's program is:

$$\begin{aligned} &\max_{p,x_1} \left[\min \left(pp(G - y_1), p(G - x_1)\right)\right] \\ &s.t. \qquad p \leq 1. \end{aligned} \tag{18}$$

Anticipating that in stage 3, country L chooses between X and $p.Y$ by picking the highest value between px_1 and ppy_1, it is straightforward to see that the firm will thus set p and x_1 such that $px_1 = ppy_1$. Indeed, there is no point in choosing p and x_1 such that $px_1 < ppy_1$, since in this case X will not be chosen anyway. On the other hand, if $px_1 > ppy_1$, F can improve its payoff by reducing x_1 until $px_1 = ppy_1$, still ensuring country L's indifference between X and $p.Y$. The firm's program thus reduces to:

$$\begin{aligned} &\max_{p,x_1} [p(G - x_1)] \\ &s.t. \qquad x_1 = py_1 \\ &and \qquad p \leq 1. \end{aligned} \tag{19}$$

Substituting for x_1, and leaving aside the constraint for the moment, this becomes:

$$\max_{p} [p(G - py_1)] \tag{20}$$

which yields $p = \frac{G}{2y_1}$. Taking now into account the constraint, two cases arise depending on the value of y_1. Specifically, if $y_1 \geq \frac{G}{2}$, $p = \frac{G}{2y_1}$ (the constraint is slack, which corresponds to the case where the firm punishes the country for setting y_1 too high, by picking a p lower than 1) and $x_1 = \frac{G}{2}$, while if $y_1 < \frac{G}{2}$, $p = 1$ (the constraint is now binding) and $x_1 = y_1$.

Anticipating this, country L will choose y_1 in stage 1, such that its payoff is maximal. It is straightforward to see that its optimal choice is also $y_1 = \frac{G}{2}$, thus leading the firm to choose $x_1 = \frac{G}{2}$ and $p = 1$, so that the outcome of the game is the Nash solution $\left(\frac{G}{2}, \frac{G}{2}\right)$. Indeed, a value of y_1 less than $\frac{G}{2}$ would clearly be suboptimal, since the firm would simply choose $x_1 = y_1$ and $p = 1$, yielding to the country a lower payoff than for $y_1 = \frac{G}{2}$. On the other side, if the country chooses $y_1 > \frac{G}{2}$, the firm's rule leads it to react choosing $x_1 = \frac{G}{2}$ and $p = \frac{G}{2y_1}$, yielding again a payoff lower than $\frac{G}{2}$ for the country (i.e. $\frac{G^2}{4y_1}$).

I now turn to the extensive game with asymmetric information:

• **Stage 1**: Country L chooses a payoff y_1 (at this stage a pair $Y = (y_1, E(G) - y_1)$, since it does not know the true value of G).

• **Stage 2**: The Firm, knowing its type, chooses a payoff x_1 (implicitly a pair $X = (x_1, G^R - x_1)$, where $x_1 \leq G^R$, the realized value of G, and $p \in [0, 1]$. With probability $1 - p$ the game ends and the outcome is the status quo. With probability p it continues.

• **Stage 3**: Country L chooses either X or the lottery $p.Y$ (where $Y = (y_1, G^R - y_1)$). Its choice is the outcome.

As we see, the only difference with the complete information case is that in stage 1, country L faces the problem of choosing y_1 such that its expected payoff conditional on the realization of the firm's type is maximum. Using the same approach as before concerning the firm's best response to any value of y_1, we see immediately the following.

If $y_1 = \frac{G_W}{2}$:

A bad type (G_W) chooses $x_1 = y_1 = \frac{G_W}{2}$, $p = 1$, so the outcome is the same as in the complete information case.

A good type (G_S) chooses $x_1 = y_1 = \frac{G_W}{2}$, $p = 1$,(as in the complete information setting when $y_1 < \frac{G}{2}$).

The total expected payoff for country L is $\nu\frac{G_W}{2} + (1-\nu)\frac{G_W}{2} = \frac{G_W}{2}$.

If $y_1 = \frac{G_S}{2}$:

A good type (G_S) chooses $x_1 = y_1 = \frac{G_S}{2}$, $p = 1$, so the outcome is the same as in the complete information case.

A bad type (G_W) chooses $x_1 = \frac{G_W}{2}$, $p = \frac{G_W}{G_S}$, (as in the complete information setting when $y_1 > \frac{G}{2}$).

The total expected payoff for country L is now $\nu\frac{G_S}{2} + (1-\nu)\frac{G_W^2}{2G_S}$.

Consider now the case $\frac{G_W}{2} < y_1 < \frac{G_S}{2}$ (it is easily shown that $y_1 < \frac{G_W}{2}$ and $y_1 > \frac{G_S}{2}$ are dominated by $y_1 = \frac{G_W}{2}$ and $y_1 = \frac{G_S}{2}$ respectively).

A good type (G_S) chooses $x_1 = y_1$, $p = 1$, (again, as in the complete information setting when $y_1 < \frac{G}{2}$).

A bad type (G_W) chooses $x_1 = \frac{G_W}{2}$, $p = \frac{G_W}{2y_1}$, (as in the complete information setting when $y_1 > \frac{G}{2}$).

The expected payoff for country L is $\nu y_1 + (1-\nu)\frac{G_W^2}{4y_1}$. This payoff is a convex function of y_1, so that the value that maximizes country L's expected payoff is either $y_1 = \frac{G_W}{2}$ or $y_1 = \frac{G_S}{2}$ depending on the values of ν, G_W and G_S. Simple computations show that there is a threshold value $\nu^* = \frac{G_W}{G_S+G_W}$. For ν below this value, $y_1 = \frac{G_W}{2}$, while for ν above it, $y_1 = \frac{G_S}{2}$, yielding the outcome described in the text.

APPENDIX 2

To see the effect of asymmetric information, we have to use the decomposition of the project's payoff into its two period components:

$$\begin{aligned} G_S &= G_1 + G_{2,S} \\ G_W &= G_1 + G_{2,W}. \end{aligned}$$

When $\nu \leq \frac{G_W}{G_S+G_W}$, the firm's payoffs from engaging in debt and FDI become (the subscripts CI and AI denote *complete information* and *asymmetric information* respectively):

$$\begin{aligned} \overline{U}^F_{DEBT,CI} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_{2,S} \\ \overline{U}^F_{DEBT,AI} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)(G_{2,S} + \Delta G_2) \\ \underline{U}^F_{DEBT} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_{2,W}, \end{aligned} \tag{21}$$

and

$$\begin{aligned} \overline{U}^F_{FDI,CI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_{2,S} + \gamma\theta\Pi^F_{2,S} \\ \overline{U}^F_{FDI,AI} &= \frac{1}{2}((G_1 - K) + \frac{1}{2}(1-\gamma)(G_{2,S} + \Delta G_2) + \gamma\theta\Pi^F_{2,W} \\ \underline{U}^F_{FDI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_{2,W} + \gamma\theta\Pi^F_{2,W}. \end{aligned} \tag{22}$$

Note that in $\overline{U}^F_{FDI,AI}$ the last term $\gamma\theta\Pi^F_{2,W}$ reflects the fact that the good type investor is taking advantage of the asymmetry of information to mimic the bad type and have a better status quo position in the renegotiation. The three payoffs above are received by the firm with respective probabilities $\nu\xi$, $\nu(1-\xi)$, and $1-\nu$. Simple computations yield the trade-off:

$$FDI \succ Debt \Leftrightarrow \gamma\left(\nu\xi\theta\Pi^F_{2,S} + (1-\nu\xi)\theta\Pi^F_{2,W}\right) - \frac{K}{2} > 0. \tag{23}$$

When $\nu > \frac{G_W}{G_S+G_W}$, the payoffs are:

$$\begin{aligned} \overline{U}^F_{DEBT,CI} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_{2,S} \\ \overline{U}^F_{DEBT,AI} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)G_{2,S} \\ \underline{U}^F_{DEBT} &= \frac{1}{2}G_1 + \frac{1}{2}(1-\gamma)\frac{G^2_{2,W}}{G_{2,S}}, \end{aligned} \tag{24}$$

and

$$\begin{aligned}
\overline{U}^F_{FDI,CI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_{2,S} + \gamma\theta\Pi^F_{2,S} \\
\overline{U}^F_{FDI,AI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)G_{2,S} + \gamma\theta\Pi^F_{2,S} \qquad (25) \\
\underline{U}^F_{FDI} &= \frac{1}{2}(G_1 - K) + \frac{1}{2}(1-\gamma)\frac{G^2_{2,W}}{G_{2,S}} + \gamma\theta\Pi^F_{2,W}.
\end{aligned}$$

Note that now the firm has revealed its type in period 1 by choosing between $x_1 = y_1 = \frac{G_S}{2}$, $p = 1$, and $x_1 = \frac{G_W}{2}$, $p = \frac{G_W}{G_S}$, so a good type has no scope for pretending being a bad type in the second period renegotiation. Similar computations as before show that in this case the trade-off is the same as under complete information.

Consider finally an information structure where the politician also gets information on the bad type project. The revelation of this piece of information allows the implementation of the complete information solution, so the efficiency loss is avoided. The politician might then threaten the firm not to reveal its information in exchange for a share of the potential gain ("give me $\alpha(\frac{G_W}{2} - \frac{G^2_{2,W}}{G_{2,S}})$ or I don't reveal you are G_W.") For the same reason as before, the FDI vs. debt trade-off is not altered by this possible extortion.

APPENDIX 3

Countries in the sample: Algeria, Angola, Argentina, Australia, Austria, Bahamas, Bahrain, Bangladesh, Belgium, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chile, China, Colombia, Costa Rica, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Finland, France, Gabon, Gambia, Germany, Ghana, Greece, Guatemala, Guinea, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Kuwait, Libya, Malawi, Malaysia, Mali, Malta, Mexico, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Romania, Russian, Saudi Arabia, Senegal, Sierra Leone, Singapore, Slovak Republic, South Africa, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Syria, Tanzania, Thailand, Togo, Trinidad, Tunisia, Turkey, Uganda, United Kingdom, United States, Uruguay, Venezuela, Yemen, Zambia, Zimbabwe.

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Table 2. Dependent variable: Ln (FDI / Total capital flows)

Sample	Panel 1985-99	Panel 1985-99	Panel 1985-99	Panel 1985-99	Panel 1985-99
Estimation method	No intercept. Time and regional dummies.	No intercept. Time and regional dummies.	No intercept. Time and regional dummies.	Fixed effects. Time dummies.	Fixed effects. Time dummies.
	(1)	(2)	(3)	(4)	(5)
Ln GDP per capita	-0.002	-0.006	0.003	0.161***	0.158***
	(0.014)	(0.015)	(0.014)	(0.051)	(0.046)
Ln Imports/GDP	0.129	0.086	0.070	-1.213**	-1.280**
	(0.256)	(0.247)	(0.259)	(0.526)	(0.534)
Ln GDP	-0.018	0.014	-0.051	-0.922*	-1.018**
	(0.068)	(0.072)	(0.060)	(0.479)	(0.450)
Soil ressources	0.149**	0.151**	0.143*		
	(0.070)	(0.070)	(0.083)		
Latitude	-1.752**	-2.025***	-1.531**		
	(0.727)	(0.764)	(0.723)		
Inflation	-0.346	0.166	-0.494	2.546**	2.543**
	(1.287)	(1.230)	(1.300)	(1.260)	(1.273)
Risk of contract	0.297*	0.311**	0.391***	0.432***	0.312**
repudiation	(0.159)	(0.156)	(0.143)	(0.150)	(0.149)
Corruption	-0.143*	-0.166*		0.107	
	(0.083)	(0.085)		(0.092)	
Corruption * dummy		-0.230*		-0.058	
low corruption		(0.121)		(0.083)	
Bureaucratic quality			0.016		-0.104
			(0.049)		(0.109)
Bureaucratic quality *			-0.103*		-0.009
dummy low bur. qual			(0.054)		(0.095)
Risk * Corruption	-0.051*	-0.054*	-0.080***	-0.073***	-0.047**
	(0.029)	(0.029)	(0.023)	(0.023)	(0.021)
N	136	136	136	201	201
R^2	0.37	0.39	0.37	0.71	0.70

White Heteroskedasticity-consistent standard errors in parentheses.
Results significant at the 1% (***), 5% (**) and 10% (*).
Regional dummies included: Latin America and Caribbean, Sub-Saharan Africa, Asia, Middle East and North Africa, Most Developed Countries (Europe, North America, Australia and New Zealand).
Estimates for time and regional dummies are not reported.

Table 3. Dependent variable: Ln (FDI / Total capital flows excluding portfolio investment flows)

Sample	Panel 1985-99	Panel 1985-99	Panel 1985-99	Panel 1985-99	Panel 1985-99
Estimation method	No intercept. Time and regional dummies.	No intercept. Time and regional dummies.	No intercept. Time and regional dummies.	Fixed effects. Time dummies.	Fixed effects. Time dummies.
	(1)	(2)	(3)	(4)	(5)
Ln GDP per capita	0.013	0.008	0.017	0.177***	0.160***
	(0.018)	(0.020)	(0.018)	(0.047)	(0.042)
Ln Imports/GDP	-0.025	-0.038	-0.079	-1.559***	-1.665***
	(0.329)	(0.319)	(0.337)	(0.515)	(0.523)
Ln GDP	0.012	0.040	-0.013	-1.102**	-1.144**
	(0.070)	(0.076)	(0.065)	(0.491)	(0.482)
Soil ressources	0.103	0.108	0.100		
	(0.087)	(0.087)	(0.095)		
Latitude	-1.454*	-1.712**	-1.308		
	(0.823)	(0.820)	(0.807)		
Inflation	-1.488	-1.114	-1.566	0.997	0.932
	(1.701)	(1.606)	(1.683)	(1.494)	(1.512)
Risk of contract repudiation	0.379**	0.386**	0.431***	0.544***	0.365**
	(0.166)	(0.165)	(0.152)	(0.155)	(0.157)
Corruption	-0.077	-0.098		0.186*	
	(0.078)	(0.081)		(0.101)	
Corruption * dummy low corruption		-0.192		0.024	
		(0.132)		(0.107)	
Bureaucratic quality			0.028		-0.171*
			(0.059)		(0.101)
Bureaucratic quality * dummy low bur. qual			-0.064		-0.040
			(0.058)		(0.098)
Risk * Corruption	-0.068**	-0.069**	-0.086***	-0.090***	-0.050**
	(0.030)	(0.030)	(0.025)	(0.023)	(0.020)
N	131	131	131	196	196
R^2	0.36	0.37	0.37	0.74	0.74

White Heteroskedasticity-consistent standard errors in parentheses.
Results significant at the 1% (***), 5% (**) and 10% (*).
Regional dummies included: Latin America and Caribbean, Sub-Saharan Africa, Asia, Middle East and North Africa, Most Developed Countries (Europe, North America, Australia and New Zealand).
Estimates for time and regional dummies are not reported.