Corruption Distance and Foreign Direct Investment

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Abstract

We study the effects of "corruption distance," defined as the difference in corruption levels between country pairs, on bilateral foreign direct investment (FDI). Using a "gravity" model and the Heckman (1979) two-stage framework on a data set of 45 countries from 1997 to 2007, we investigate how corruption distance affects the likelihood of FDI in the first stage; subsequently in the second stage, we examine the effect of corruption distance to the volume of FDI. We find that corruption distance adversely influences both the likelihood of FDI and the volume of FDI. A novel finding of this study is that we identify the asymmetric effect of corruption distance and find that the positive corruption distance, defined as the corruption distance from a high corruption source to a low corruption host country, is the prominent one that affects the behavior of bilateral FDI.

Keywords: Foreign direct investment, corruption, developing countries.
JEL Classifications: F21, F23, F59, O5

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1. Introduction

Foreign Direct Investment (FDI) flows have been growing substantially since the beginning of the globalization era in the 1980s, reaching a record high of $1.97 trillion in 2007 (UNCTAD STAT)[1]. FDI constitutes one of the most important forms of capital flows in global capital markets, particularly in emerging markets. According to McKinsey Global Institute (2011), FDI accounted for 53% of total capital inflows to emerging markets for the period of 2000-2010. FDI is perceived as a significant source of growth in developing countries (Borensztein, et al., 1998; Hansen and Rand, 2006).

The literature on the determinants of FDI flows identifies a variety of relevant factors, including market seeking motives, natural resource endowments, political risks, and the quality of institutions, among others[2]. Corruption in host countries is one factor that has been widely scrutinized. Although relatively abundant, the literature on corruption and FDI is inconclusive in its findings.

Corruption may deter FDI by making a host country unattractive to foreign investors via the high costs of entry and uncertainty, and distorting incentives to invest. A strand of empirical literature supports such negative effects of corruption on FDI (Mauro, 1995; Wei, 2000a; Wei, 2000b; Seldadyo and de Haan, 2011). Bribes paid by firms act as taxes; the rent seeking activities facilitated by corruption result in waste of resources; and there are additional costs due to the inability to enforce contracts that result from the corruption practices (see for example Wei, 2000a; Habib and Zurawicki, 2002; Lambsdorff, 2003).

However, research on the negative effects of corruption on FDI is far from conclusive. Some authors find no significant association between corruption and FDI (Wheeler and Mody, 1992; Alesina and Weder, 2002; Glass and Wu, 2002). Others find that, under specific circumstances, corruption may even enhance efficiency and stimulate FDI. For example, when companies are willing to pay bribes, corruption acts as a “helping hand” increasing their revenues (Olson, 1993; Egger and Winner, 2005). Corruption speeds up the bureaucratic process

[1] The 2008 global financial crisis caused a pronounced drop on FDI flows that just started to recover by 2010 when around $1.24 trillion were registered (UNCTAD STAT).

[2] See for example, Blonigen (2005) for a review.

to obtain the legal permissions for setting up a foreign plant - the “speed money” argument (Lui, 1985), and helps to gain access to public funded projects (Tanzi and Davoodi, 2000).

This lack of consensus leads to the search for alternative explanations of the effects of corruption on FDI. Based on an argument borrowed from the management literature, some authors stress the role of “psychic distance,”[3] as a factor that investors consider in their FDI allocation decisions. The selection of a similar market reduces uncertainty; “psychic closeness” would reduce the perceived uncertainty and learning costs about the host country, promoting FDI activities. Alternatively, the greater the “psychic distance” between two countries, the more difficult it becomes for investors from both countries to know how to deal with each other, which increases uncertainty and deters FDI[4]. Habib and Zurawicki (2002) adopted this notion of similarity from the psychic distance argument and introduce the idea of “corruption distance” to study its impact on bilateral FDI. They analyzed bilateral FDI flows from seven developed countries to 89 countries and found that the absolute difference between corruption levels of country pairs has a negative effect on FDI.

In this paper, we study the association between corruption distance and FDI. Our analysis employs gravity specifications on a sample of 45 country-pairs for the period of 1997-2007. Studying bilateral FDI flows encounters the problem of a predominance of zeros in the bilateral FDI matrix. This creates the classical problem of “selection bias” (Helpman, Melitz, and Rubinstein, 2008; Razin, Rubinstein, and Sadka, 2003; Razin, Sadka, and Tong, 2005). We deal with the sample selection bias by implementing the Heckman (1979) two-stage approach; in the first stage, we study what determines the likelihood of FDI decision on whether to invest or not. Once a positive go-investing decision is made in the first stage, we examine the determinants of the amount of FDI to be invested in the second stage. A closely related paper to our exercise is Habib and Zurawicki (2002). However, these authors included only the absolute corruption distance between home and host country. Additionally, they constrained their home-countries to seven industrial economies, and their sample covered only 3 years (1996-1998). More

[3] For example, Johanson and Wiedersheim-Paul (1975) and Johanson and Vahlne (1977 and 1990)

[4] Ghemawat (2001) suggests four dimensions of distance, namely cultural, administrative, geographic, and economics. The corruption distance is one type of administrative distance.

importantly, unlike Habib and Zurawicki, we identify the effects of the positive and the negative corruption distance, and find that it affects FDI asymmetrically; the asymmetric effects are driven mainly by the positive corruption distance.

More generally, our contribution to the literature on corruption and FDI is two-fold. First, most of the studies focus on how corruption affects FDI flows from industrial to developing countries. In contrast, our paper carries out a comprehensive analysis of the impact of corruption on bilateral FDI flows between industrial-industrial, industrial-developing, developing-industrial, and developing-developing country-pairs. Furthermore, corruption is not an exclusive characteristic of low income countries as some industrial countries are perceived to be at least as corrupt as their developing counterparts. For instance, Italy is perceived to have similar high levels of corruption as Brazil and Ghana; Chile and Uruguay have mild levels of corruption comparable to those prevalent in the United States and France (Transparency International, 2011).

These similarities and differences on corruption levels between industrial and developing countries make interesting to study firms' investment decisions when they face the choice between two countries with similar levels of corruption but different institutional environment and stages of development. For example, a choice between an industrial country with a democratic political system and a developing country with an autocratic regime would be a totally different experience for investors. It is expected that corruption would have a different impact on FDI's decisions in a democratic, developed host country compared with less developed host countries with a weaker institutional quality.

In order to analyze these subtle differences, we extend our empirical exercise by splitting our data set into subsamples of industrial and developing countries. Both industrial and developing countries can be a source and host of FDI. In particular, we test the hypothesis that, for different FDI source-host-country pairs (e.g. an industrial- developing versus a developing-developing source-host country-pair), the effects of corruption distance imposed on bilateral FDI may be different.

Second, and more importantly, we identify the asymmetric effects of corruption distance and investigate how corruption distance affects bilateral FDI asymmetrically. To illustrate the intuition behind the asymmetric effects of corruption distance on bilateral FDI flows, consider a source country with a “medium” corruption level, say a corruption index of 4, whose investors may invest in two alternative host countries with relatively “high” and “low” corruption levels, say with indices of 6 and 2 respectively. It is reasonable to expect that investors would consider differently when investing in the lower corruption host country versus the higher corruption one, even though the absolute corruption distance between source and host countries is the same, or equal to 2. Thus, one would argue that corruption distance may have asymmetric effects on bilateral FDI.

To preview our main results, we find that corruption distance adversely affects both the likelihood and the amount of FDI. The reduction effect of corruption distance, however, varies across different source-host-country-pair samples. We identify the asymmetric effects of corruption distance and find that the positive corruption distance (measured as the difference of the corruption index of a high corruption source and a lower corruption host) is the prominent one affecting the behavior of bilateral FDI. Again, the degree of such asymmetric effect varies across different country pair samples.

The rest of the paper is organized as follows. In Section 2, we describe the data and some issues associated with it. Section 3 presents the empirical estimate models – the basic and augmented gravity models, and the regression results. We conclude in Section 4.

2. Data description

Prior to the econometric investigation of how corruption distance affects bilateral FDI inflows, it is useful to provide with a description and explanation of the special treatments applied to the data and the key variables that are used in our study.

We use an annual data set of 45 countries, including 18 industrial and 27 developing and transition economies, from 1997 to 2007. The size of the sample is limited by data availability. Appendix A presents the complete list of countries included in our sample. The classification of countries into “developed” and “developing” follows UNCTAD’s (United Nations Conference on Trade and Development) classification. The data on bilateral FDI flows are from the Economist Intelligence Unit (EIU), World Investment Service, which, according to its web page, compiles data on FDI flows by country for the 60 largest economies in the world, accounting for over 95 % of global FDI.

We create a pairwise (source to host country) and cross-time (from 1997 to 2007) panel data set. There are a total of 21,780 (= 45*44*11) observations. FDI flows from a source to a host county in one particular year are measured in current US dollars. Presumably, all data points would be recorded as a zero (no FDI from a source to a host country) or a positive number (some FDI flows from a source to a host country). However, about 8% of the observations are negative numbers. This means that a source country dis-invests some of its FDIs from a host country; for instance, if a US multinational company liquidates a foreign subsidiary in Malaysia, this is recorded as negative FDI inflows.

Another issue is the large amount of missing observations that characterizes the data on bilateral FDI flows. Countries may only report FDI flows over a certain threshold size and this threshold varies across reporting countries. To accommodate our econometrics model, we treat both negative and missing observation as zeros[5]. A similar approach is used by Aisbett (2009), Hattari and Rajan (2009), and Razin et al. (2005).

The explanatory variable of interest is corruption distance, which is constructed using the corruption perception index compiled by the International Country Risk Group (ICRG). In the ICRG's index low scores indicate "high levels" of corruption. The minimum and maximum rating any country could receive is 1 and 6, respectively[6]. To facilitate the interpretation of the results, we reverse the measurement of corruption level by subtracting the original corruption index from 7, so that 1 measures the lowest corruption level and 6 corresponds to the highest level of corruption. That is, a high value of corruption index now represents a high level of corruption.

3. Estimation and results

3.1. Basic gravity model

Our benchmark specification, to study the effect of corruption distance on bilateral FDI flows, is a basic "gravity model". Gravity models used in international economics rely on the proximity-concentration hypothesis (Horstmann and Markusen, 1992; Brainard, 1993; Markusen and Venables, 2000, Anderson and van Wincoop, 2003). These models postulate that bilateral

[5] The main results do not differ when we exclude from our analysis the missing observations.

[6] For a detailed description of the ICRG data see Knack and Keefer (1995).

international flows (goods, FDI, etc.) between any two economies are positively related to the size of the two economies (e.g., population, GDP), and negatively related to the distance and a set of variables accounting for relative costs (tariffs barriers, information asymmetries, etc.). The gravity model has been widely used in the literature for explaining FDI (Eaton and Tamura, 1995; Habib and Zurawicki, 2002; Head and Ries, 2008; Razin et al., 2005; Wei, 2000a; Wei and Wu, 2001).

Due to the zero-censored structure of our data (about 59% of total observations of bilateral FDI data are zeros) we have to be careful and choose a proper econometrics model to deal with the "selection bias" that arises from the presence of excessive zeros in the data (Helpman, Melitz, and Rubinstein, 2007; Razin, Rubinstein, and Sadka, 2003; Razin, Sadka ,and Tong, 2005). The Heckman two-stage method (Heckman, 1979) provides with a convenient way to deal with the selection bias problem. Further, the two-step procedure allows us to analyze the decision making process of FDI in two sequential stages. In the first stage, we study the factors determining FDI investor's decision on whether or not to invest in a specific country. In the second stage, we examine the factors determining the amount to be invested following the go-investing decision in the first stage.

The first stage decision to invest or not is estimated using the following regression specification,

$$D_{ij,t} = \alpha + \beta CorDist_{ij,t-1} + \gamma X_{ij,t-1} + Trend + \varepsilon_{ij,t} \qquad (1)$$

where $D_{ij,t}$ is a dummy indicator with $D_{ij,t} = 1$ if $FDI_{ij,t} > 0$ and 0 otherwise. $FDI_{ij,t}$ are bilateral FDI flows from the source country *i* to the host country *j* at time *t*. There are two reasons for using FDI flow data, as oppose to the stock data of FDI, to construct the dependent variable in Equation (1). First, the specification of gravity model requires the use of flow data; second, the flow data circumvents the issue of "valuation effect" that arises from using of FDI stock data.

$CorDist_{ij,t-1}$ is the "corruption distance", measured as the logarithm of the absolute value of the difference between source country *i* and host country *j*'s corruption index plus 2, $\log(|Cor_{i,t-1} - Cor_{j,t-1}| + 2)$. We take this log operation on the absolute value of corruption distance in order to accommodate the gravity model. Normally, we can simply take a logarithm on absolute corruption distance, $\left|Cor_{i,t-1} - Cor_{j,t-1}\right|$ to generate the needed data series. However, because 23% of the observations of the absolute corruption distance have a value of either 0 or 1, such a logarithm operation will force us to drop a large number of observations and transform a sizeable amount of observations into zero. To cope with these issues, we extend the method of Eichengreen and Irwin (1995) and use $\log(\left|Cor_{i,t-1} - Cor_{j,t-1}\right| + 2)$ to obtain the final measure of corruption distance. Adding 2 before taking the logarithm operation will allow us to keep as many available observations as possible. In addition, our transformation keeps the original properties of the data when constructing "corruption distance" measure. Greater values of $\log(\left|Cor_{i,t-1} - Cor_{j,t-1}\right| + 2)$ indicate larger differences in corruption level between the source and host country. $Cor_{i,t}$ and $Cor_{j,t}$ are the corruption indexes of source and host country, respectively. To avoid the reverse causality problem, we lagged the corruption distance, $CorDist_{ij,t-1}$, one year.

$X_{ij,t-1}$ is a vector containing standard control variables included in basic gravity models. We include GDP of both source and host country (*GDP_S* and *GDP_H*), the geographical distance (*Distance*), measured in logarithms, as well as dummy variables for common legal system (*Legal*) and common language (*Language*). To cope with endogeneity problems, both source GDP (*GDP_S*) and host GDP (*GDP_H*) are lagged one year. Data of both *GDP_S* and *GDP_H* are in logarithms and retrieved from World Economic Outlook (WEO) of the IMF. We also include a "trend" variable to control for a possible time trend effect. The definitions and data sources of these and other variables used in this study are given in Appendix B.

In the first stage of the Heckman method, we postulate that the likelihood of a source country to invest in a host country is determined by the factors listed in the censored regression specification (1). The gravity model predicts that the bigger the size of the economies and the closer the distance, the greater the bilateral FDI flows. Hence, we expect that economy size of source and host country, a common legal system, and language are to be associated with a higher probability of FDI from a source to a host country, while geographical distance would reduce the likelihood of FDI.

The technical issue of zero-censored data–the selection bias problem– is controlled by using the inverse Mills ratio (also known as the hazard rate). The Mills ratio, which contains information about the unobserved factors that determine the likelihood of bilateral FDI, is retrieved from equation (1), and will be included in the second stage of the Heckman regression. The significance of the inverse Mills ratio reflects the importance of selection bias[7]. To circumvent the problem of substantial collinearity between the predicted Mills ratio and the independent variables in the second stage, the Heckman method requires imposing exclusion restrictions. At least one variable from the first stage estimation should be excluded in the second stage. The problem is to find restriction variables that help to determine the selection process (in the first stage) but not the outcome (in the second stage). In the case of FDI, the restriction variable must affect the likelihood of the source country to invest in the host country, but not the volume of FDI. Helpman et al (2008) argue that entry costs for exporting firms to operate in the host country affect their fixed costs but not their variable costs of trade. Thus, they only affect the likelihood, not the volume of FDI. We follow Helpman et al. (2008) to generate two measures of entry costs: *Proc Days* and *Regulation Cost* and use them as our exclusion variables. *Proc Days* is an indicator that equals one if the sum of the number of days and the number of procedures to form a business is above the median for both the source country i and the host country j, and zero otherwise. The second variable *Regulation Cost* takes the value of one if the relative cost (as percent of GDP per capita) of forming a business is above the median in the host country j and the importing country i, and zero otherwise. We construct these variables using the data from Djankov et al. (2002)

Given the pair-wise cross-section and cross-time data, we apply the Wooldrige (1995) procedure that extends the Heckman method to panel data. Specifically, we use the panel data

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[7] The inverse Mills ratio is given by the probability density function over the cumulative distribution function estimated in the first stage, which includes both zero and non-zero observations. Intuitively, the ratio captures the effect of truncating the sample and is included to control for selection biases in the second stage regression, which uses only positive (but not "zero") FDI observations.

Probit regression with random effects[8] with both zero and positive FDI observations. The results from estimating equation (1) are presented in column A1 of Table 1.

The corruption distance estimate is negative and significant at the 10% level. This result, which is in line with other findings, indicates that corruption distance adversely affects the decision of whether to invest or not. Further, the value of this estimate suggests that a 1% increase in corruption distance reduces the likelihood of FDI by about 0.1%. As expected, the GDP of both the source and host country have a positive effect while the geographical distance has a negative effect on the likelihood of FDI. A common legal system between two countries raises the chance of FDI; however sharing a common language is not a significant factor. The coefficients of both number of days and regulation costs are negative and significant. This indicates that higher entry costs significantly reduce the likelihood of FDI. There is a downward time trend effect on the bilateral FDI over the period of 1997 to 2007 among our sample countries.

In the second stage of the Heckman procedure, we assess the determinants of the amount of FDI to be invested following a positive decision in the first stage. The assessment is based on the regression specification (2) below by using pooled data with the positive $FDI_{ij,t}$ observations only.

$$\log(FDI_{ij,t}) = \alpha + \beta CorDist_{ij,t-1} + \gamma X_{ij,t-1} + \lambda Mills_{ij,t} + \varepsilon_{ij,t} \qquad (2)$$

where the dependent variable is the logarithm of $FDI_{ij,t}$ and $FDI_{ij,t} > 0$. The independent variables are the same as in equation (1) except that we drop the two entry cost variables and add the inverse Mills ratio, $Mills_{ij,t}$, in equation (2). As mentioned above, $Mills_{ij,t}$ is based on estimates from the first stage regression (1) and is included to control for possible selection bias when estimating (2). Country-effects and year-effects dummy variables are also included in the estimation process but they are not reported for brevity. The estimation results are presented in the column A2 of Table 1. The inverse Mills ratio is estimated to be significant – there is

[8] The fixed effect specification would generate biased estimates under the censored specification (Greene, 2004a, 2004b).

evidence that the unobserved factors in the first stage selecting process affect the investment decision in the second stage.

In line with conventional wisdom, our results show that the amount of FDI to be invested is adversely affected by corruption distance. Our model estimates indicate that a one percent increase in corruption distance reduces the volume of bilateral FDI by approximately 0.13%.

Combining the results in the first and second stage, we find that a higher corruption distance reduces both the likelihood and the volume of FDI flows. Thus, we can confirm that corruption may affect FDI behavior via closeness of corruption level; more specifically, we find that the greater the similarity in corruption levels between two countries the higher the levels of bilateral FDI flows.

There is no consensus in the literature on the effect of corruption on FDI, if one only considers the level of corruption of the host country. Some have argued that corruption produces inefficiencies and uncertainties and imposes extra costs on FDI, which discourages FDI activities (Shleifer and Vishny, 1993; Mauro, 1995; Wei, 2000a). On the other hand, others argue that corruption sometimes “greases the wheels of commerce”, providing firms with preferential treatment to operate in profitable markets (Egger and Winner, 2005; Leff, 1964 and 1989; Lui, 1985; Kaufmann and Wei, 1999). In this paper, we depart from the idea that it is the corruption level of the host country that affects FDI directly. Rather, we focus on the relative level of corruption – corruption distance, and we find that corruption distance matters for FDI.

For multinationals, FDI is a long term commitment to the host country; hence, in order to operate in a corrupt host country, foreign investors should get used to dealing with corruption for an extended period of time. Exposure to corruption at home provides firms with experience and expertise to handle similarly high levels of corruption abroad (Habib and Zurawicki, 2002). The inability of firms from less corrupt countries to handle higher levels of corruption in a host country may result in a reduction of FDI involvement in the long term. In contrast, corruption expertise in home country may become redundant in a host “clean” market. This would make FDI from relatively corrupt countries unable to compete fairly with other FDIs and eventually retreat. Overall, it is the “distance” of corruption that FDI investors need to overcome. Greater corruption distance would make more difficult for foreign firms to handle the less familiar corruption situation in host countries, resulting in less FDI.

Our results are consistent with those of Cuervo-Cazurra (2006) and Habib and Zurawicki (2002), who find a negative relationship between corruption distance and FDI. However, by breaking down the investment decision process, our two-stage procedure reveals subtler effects of corruption distance on FDI than those previously reported by Cuervo-Cazurra (2006) and Habib and Zurawicki (2002).

Similar to the first stage regression's results, the GDP of both the source and host countries are estimated significantly positive, and the geographical distance is negative and significant as well. A common legal system and a common language between the source and host country are now significant as well. These results constitute evidence that countries sharing the same legal system or speaking the same language invest more FDI with each other. Overall, the gravity model specification fits well as it explains 60% of the bilateral FDI variation.

3.2. Augmented gravity model

Although the basic gravity model works well, one may argue that bilateral FDI between two countries may not solely be decided by gravity factors. More importantly, there are other characteristics of the host country (pull factors) that may attract FDI. Those pull factors include market opportunities (e.g. GDP growth), natural resource endowment, trade openness, wage level, and political risks (e.g. political stability, institutional quality, and law and order, etc.). We augment the basic gravity model, and include those factors above, to study the bilateral FDI behavior again in the Heckman two-stage specification as follows:

$$D_{ij,t} = \alpha + \beta CorDist_{ij,t-1} + \gamma X_{ij,t-1} + \varphi Y_{j,t-1} + Trend + \varepsilon_{ij,t} \quad (3)$$

$$\log(FDI_{ij,t}) = \alpha + \beta CorDist_{ij,t-1} + \gamma X_{ij,t-1} + \varphi Y_{j,t-1} + \lambda Mills + \varepsilon_{ij,t} \quad (4)$$

Where $CorDist_{ij,t}$ and $X_{ij,t-1}$ are the same as in the basic gravity model. $Y_{j,t-1}$, contains the host country pull factors that may affect bilateral FDI inflows, including real income growth rate (*RGDPG_H*), trade openness (*Opne_H*), natural resource endowment (*Natural_H*), the unemployment rate (*Unempl_H*), corruption index (*Cor_H*), and political risk index (*Risk_H*).

The real income growth rate (*RGDPG_H*) measures the market growth potential (Kravis and Lipsey, 1982; Lipsey, 1999). The market seeking motive of FDI implies that *RGDPG_H* has a positive coefficient. The association between international trade and FDI has been extensively documented[9]. Restrictive trade policies encourages multinationals to overcome trade barriers by opening similar plants in different markets (horizontal FDI). However, differentials in production costs differentials may lead to the fragmentation of the production process. In such a situation, labor intensive stages are allocated in low wage countries, and the capital intensive stages would be allocated in capital intensive countries (vertical integration). As Aizenman and Noy (2005) suggest, "...horizontal FDI tends to substitute trade, whereas vertical FDI tends to create trade". Thus, if vertical FDI is more prominent, we expect that high trade openness of a foreign country would attract more FDI.

The natural resource seeking motive suggests that multinational enterprises tend to invest overseas to take advantage of the availability of natural resources in host countries. To examine the natural resource seeking motive, we include the natural resource endowment (*Natural_H*) variable to proxy for the natural resource availability of a host country. *Natural_H* is constructed by combining the host country's energy output (includes crude oil, natural gas, and coal output) and mineral output (includes bauxite, copper, iron, and gold, etc.). Both energy and mineral outputs are normalized by the host country's gross national income.

The wage level and the availability of labor in a host country should affect FDIs seeking efficiency. Lower wages and more abundant labor should attract more FDI. Wage data is scant, particularly for developing countries. Hence to proxy for labor market conditions in the host country, we use the unemployment rate (*Unempl_H*). Under tough economic conditions with high unemployment rate, workers would value more their current job, and would be willing to accept lower wages to keep it (Habib and Zurawicki, 2002). Thus, FDI takes advantage of high unemployment. We expect a positive association between unemployment rate and FDI.

In addition to corruption, FDI could be adversely affected by the presence of other risk factors related to the quality of institutions (Baek and Qian, 2011; Bénassy-Quéré et al., 2007; Busse M. and C. Hefeker, 2007; Cheung and Qian, 2009; Cheung et al., 2012; Méon and Sekkat,

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[9] For a review of the literature on trade and FDI, see Blonigen (2005).

2004). We include the political system risk index, *Risk_H*, to measure the overall political risk level. *Risk_H* is calculated as the sum of 11 different country risk indices from the *International Country Risk Guide* (ICRG). These indices are: socioeconomic conditions, investment profile, government stability, military in politics, democratic accountability, internal conflict, external conflict, religious tensions, ethnic tensions, bureaucracy quality, and law and order risk. According to the measurement of ICRG, a higher index value indicates a lower level of risk. Again, to facilitate the interpretation of the results, we reverse the measure of political risk index. In our measure, a higher value indicates a higher level of political risk. Thus, if high political risk deters FDI, we should expect a negative coefficient for *Risk_H*.

We also include the corruption level of a host country, *Cor_H*, as an individual variable in our regression. Although we emphasize the role of corruption distance, we should not ignore the effect of corruption in host country to FDI. Indeed, Habib and Zurawicki (2002) find a similar degree of adverse effect of both corruption and corruption distance to FDI. All variables in $Y_{j,t-1}$ are lagged one year to deal with endogeniety issues.

We report the results of Heckman first and second stage of the augmented gravity model in columns B1 and B2 of Table 1, respectively. We estimate a negative, but not significant, coefficient to the corruption distance in the first stage. It seems that, in determining the likelihood of FDI, the corruption distance becomes less important once other relevant factors in the host country are considered. Adding more relevant factors in the first stage regression does not affect the results from the basic gravity model, except that *Language* variables are now significant.

The level of corruption in a host country (*Cor_H*) is not found to reduce the likelihood of FDI significantly. The entry costs, which in some degree may reflect the corruption level of a host country, are both negative and significant. As expected, high political risks (*Risk_H*) reduces FDI, while trade openness (*Open_H*), and high unemployment rate (or low wage rates) in a host country increase the probability of bilateral FDI. Real economic growth seems to have no effect on the investors' decision of invest or not.

Interestingly, host countries with a high endowment of natural resources have lower likelihood of receiving FDI. One plausible explanation for this puzzling result is that large multinationals may be already operating in natural resources rich countries, e.g. Shell in Nigeria.

New FDI trying to access those countries have to face stiff competition for the existing occupants and usually results in lower probability to success, which deters FDI (Cheung et al. 2012).

In the second stage, we confirm that a higher corruption distance between source and host country reduces the amount of bilateral FDI. Among host country pull factors of FDI, we find that high economic growth potential (*RGDPG_H*) attracts higher volume of FDI. The rest of the factors, including *Cor_H*, *Risk_H*, *Natrual_H*, *Open_H*, and *Unempl_H*, do not impose significant effects on the amount of FDI. Adding relevant pull factors into the benchmark specification marginally increases the explanatory power in the second stage of Heckman regression, as R-square only increases from 60% to 61%.

3.3. Estimation with different FDI source and host country samples

The perception by investors of the prevalent corruption may differ for industrial and developing nations, even though the definition of corruption is similar for all countries. Investors from a source country with the same corruption distance with respect to both an industrial and a developing country may react to corruption in an industrial country differently than that in a developing country. For example, for a U.S. firm facing the decision of whether to invest in Italy or Saudi Arabia (both of which have a corruption index of 4.3), other things equal, it is more likely that the U.S. firm would choose Italy. Investors would probably feel more secure in dealing with the corruption rooted in a Western democratic system, similar to that of the U.S. instead of that of Saudi Arabia, a non-democratic less developed country.

Likewise, investors from developing countries may be more willing to invest in other countries with similar level of development, other things equal. Indeed, a considerable share of total FDI inflows to developing countries are originated from other developing countries (World Investment Report, UNCTAD, 2006), rather than from the capital abundant industrial world.

Against this backdrop, we empirically address the question of whether investors from industrial countries treat corruption in developing countries differently than investors from developing countries, and vice versa. To investigate these subtle differences, we fine tune our analysis by separating the entire sample into pair-wise sub-samples. This will allow us to study the possible different effects of corruption distance in each individual sub-sample. We split the whole sample into four sub-samples: industrial-industrial, industrial-developing, developing-developing, and developing-industrial, source and host countries respectively.

The results for the sub-sample of industrial source and industrial host are reported in Table 2. Columns A1 and A2 correspond to the results of the basic gravity model, and columns B1 and B2 are for the augmented gravity model. High corruption distance between two industrial countries does not affect the likelihood of FDI significantly. However, it does reduce the volume of FDI to be invested. Compared to the results in Table 1, such a volume reduction effect is much stronger (0.6 versus 0.1). These results may explain why, for example, Italy, a developed country with one of the highest perceived corruption environments in the industrial world, receives scant FDI from other industrial countries. Most estimates for other relevant factors are in line with conventional wisdom, except that the political risk variable is positive and significant.

Tables 3, 4, and 5, report the results from industrial-developing, developing-developing, and developing-industrial source-host sub-samples, respectively. The results in Table 3 suggest that corruption distance is not a factor considered by industrial source countries when dealing with developing countries. This, to some degree, may explain why some developing countries such as China, Brazil, and Mexico still attract large volumes of FDI from the industrial world despite perceived high levels of corruption.

The results from the basic gravity model reported in Table 4 indicate that a high corruption distance between two developing countries reduces the likelihood of FDI (Column A1 of Table 4). However, once other factors of FDI are added (Column B1 of Table 4), the corruption distance becomes insignificant. Moreover, the corruption variable (*Cor_H*) is estimated to be negative and significant in both likelihood and FDI volume regression. This suggests that when investing in a developing country, a developing source country may put more weight on the corruption level of the host country, rather than on the relative level of corruption, which is captured in the corruption distance.

When investors from developing countries consider allocating FDI in an industrial host, it seems that the corruption distance does not have any significant effect on FDI, although the sign of coefficients are all negative. This makes sense, since in most cases when a developing country FDI flows into an industrial country, the main motive is to seek efficiency. That is, developing countries try to access high technologies and management know-how via FDI. Such efficient seeking motive may overshadow the effects of other factors, including corruption.

In sum, the corruption distance may only matter when an industrial nation invests in its industrial peer and a developing nation invests in its developing peer. Moreover, in addition to the adverse effect of corruption distance, the corruption level significantly reduces the volume of FDI, when the same group countries invest each other. We find little evidence that industrial FDI flows to a developing country or vice versa are affected by corruption distance.

3.4. Estimation of the asymmetric effects of "corruption distance" to FDI

In previous sections, we use the absolute value of "corruption distance" to study its effect on FDI, without differentiating between positive and negative corruption distances. Recall that the corruption distance is calculated as the difference of the corruption indices of the source and host countries. Hence positive corruption distances are obtained when we subtract corruption index of a "cleaner" host from a "dirtier" source, and negative corruption distances are calculated by subtracting corruption index of a "dirtier" host from a "cleaner" source. When a firm faces the decision to invest in either a country with positive distance (i.e. investing in a lower corruption country) or in a country with negative distance (i.e. investing in a higher corruption country), both of which have the same absolute corruption distance, positive and negative corruption distance may have different impact on the firm's decision.

Given the above arguments, we hypothesize that there are asymmetric effects of corruption distance to bilateral FDI. To examine the different asymmetric effects of positive and negative corruption distance, we use our gravity models and estimate equations (5) and (6) below, where the absolute corruption distance variable is replaced by positive corruption distance and negative corruption distance variables.

$$D_{ij,t} = \alpha + \beta_1 CorDist(+)_{ij,t-1} + \beta_1 CorDist(-)_{ij,t-1} + \gamma X_{ij,t-1} + \varphi Y_{j,t-1} + Trend + \varepsilon_{ij,t} \qquad (5)$$

$$\log(FDI_{ij,t}) = \alpha + \beta_1 CorDist(+)_{ij,t-1} + \beta_1 CorDist(-)_{ij,t-1} + \gamma X_{ij,t-1} + \varphi Y_{j,t-1} + \lambda Mills + \varepsilon_{ij,t} \qquad (6)$$

where $CorDist(+)_{ij,t-1}$ and $CorDist(-)_{ij,t}$, denote the positive and negative corruption distance respectively. Intuitively, a higher value of both positive and negative corruption distances imply less similarity between source and host countries, which would reduce the bilateral FDI. Thus, we expect both coefficients to be negative.

Table 6, columns A1 and A2 show the results of the first and second stages of the basic gravity model, and columns B1 and B2 present the results of the augmented gravity model with the full sample. Indeed, as expected both positive and negative corruption distance get negative coefficients in both gravity models. However, the coefficients of the positive corruption distance are significant at the 1% level in both stages; whereas the estimates for the negative corruption distance are only 10% significant at the first stage. Furthermore, we do not find evidence that the negative corruption distance significantly impact the volume of FDI (Colume A2). In addition, the coefficient value of the positive corruption distance is much greater than those of the negative corruption distance. These results validate our hypothesis that there are asymmetric effects of corruption distance on bilateral FDI.

According to our estimates, when a highly corrupt country decides to invest in a less corrupt country (positive corruption distance), the corruption distance has a significant role in reducing both the likelihood and volume of FDI. On the other hand, the corruption distance does not have a statistically significant effect on the volume of FDI when a less corrupt source invests in a more corrupt host (negative corruption distance). Positive and negative corruption distance impacts bilateral FDI behavior differently, and the positive distance is the prominent driver in the effects of the absolute corruption distance on bilateral FDI.

In the augmented gravity model, adding host country pull factors reduces the significance of the positive corruption distance in both the first and second stages. While it becomes insignificant in the first stage, it is still at 5% significance in the second stage. Both negative corruption distances are not significant. Overall, we find that the corruption distance adversely affects the bilateral FDI. However, such an effect may turns out to be asymmetrical – it has a significantly adverse effect when FDI flows from a high level corruption source to a low level corruption host country (positive distance), but not vice versa.

Similar to the results presented in Table 1, the results in Table 6 indicate that the positive corruption distance adversely affect FDI in both stages, although the significance of the first stage estimation decreases slightly when a few pull factors of host country are added. However, the negative corruption distance only has mostly an insignificant effect on FDI. We believe that the asymmetric effect is the reason for such differences and that the overall negative effect of absolute corruption distance is mainly driven by the positive corruption distance. Moreover, if we compare the estimates of absolute corruption distance in Table 1, column A1 and A2, with the estimates of positive distance from Table 6, column A1 and A2, we find that the latter exerts a greater degree of reduction effect to both the likelihood and the volume of FDI. Overall, separating the positive and negative distance provides us with a better framework to scrutinize how corruption distance affects bilateral FDI behavior.

To examine the possible different effects due to different source and host pair as we discuss in Section 4.3., we replicate our regressions on (5) and (6) using the sub-samples of industrial-industrial, industrial-developing, developing-developing, and developing-industrial source-host pairs respectively. The results are displayed in Tables 7 to 10. Overall, we find some evidence of asymmetric effect of corruption distance when an industrial source invests in a developing host and in developing-developing pairs. However, the effect is not robust across different model specification (see for example Table 8). In the industrial- industrial pair sub-sample, both positive and negative corruption distances are found to reduce the volume of bilateral FDI. However, it seems that the reduction effect for a negative corruption distance is stronger than the one from the positive corruption distance (Table 7). When FDI from a developing source invests in either developing or industrial hosts, both positive and negative corruption distances adversely affect the likelihood of FDI. It seems that there is virtually no asymmetric effects in the industrial-developing pair, as both estimates for *CorDist (+)* and *CorDist(-)* resulted with the same sign and magnitude. However, the results in Table 8 were all insignificant. For the sub-sample of developing-industrial pair, the negative corruption distance has a stronger effect than the positive one on the likelihood of FDI.

In summary, we find asymmetric effects of positive and negative corruption distance. However, the magnitude and the significance of such effects depend on which sub-sample we are using. In addition, the asymmetric effects may only materialize in different FDI decision stages. For instance, the asymmetric effects only affect the second stage when an industrial country invests in a developing host.

4. Concluding remarks

We study the effects of corruption distance on bilateral FDI flows. There is statistically significant evidence that corruption distance adversely affects both the decision on whether or not to invest and the decision on the amount of FDI from the source country.

In addition to studying the entire data sample, we separate the data into four sub-samples, namely industrial-industrial, industrial-developing, developing-developing, and developing-industrial source-host pair countries respectively. We take this approach to support the argument that, even though a source country has the same corruption distance with respect to both an industrial and a developing country, it perhaps reacts to corruption in industrial countries differently than in developing countries.

Indeed, we find that corruption distance between industrial countries does not affect the likelihood of FDI, but it reduces the amount of FDI to be invested. Industrial source countries appear not to consider corruption distance as a factor when dealing with host developing countries. In contrast, when investing in a developing country, investors from developing countries may put more weight on the corruption level of a host developing country, rather than on the relative level of corruption, as captured by the corruption distance. There is no effect from corruption distance when developing country investors consider allocating FDI in an industrial host. It is perhaps overshadowed by the efficiency seeking motive.

We extend our analysis by separating corruption distance according to its direction, namely positive and negative corruption distance, to study the possible asymmetric effects of corruption distance on FDI. While a positive corruption distance implies that a host country has better institutional environment and less corruption, a negative corruption distance means a source country is relatively less corrupt. We identify the asymmetric effect of corruption distance and find that the positive corruption distance is the prominent one to affect the behavior of bilateral FDI and the overall adverse effect of corruption distance is perhaps mainly driven by the positive corruption.

In this paper, we provide an alternative framework on how corruption affects FDI. Corruption may not necessary deter FDI. It is, to some extent, the corruption distance between the source and host countries that matters for FDI. Those high corruption countries (e.g. some African countries) seeking to attract FDI to develop their domestic economies, may not need to focus only on FDI from industrial countries; but instead they should adjust their policies to attract more FDI from developing countries with a close level of corruption as their own. Such countries may include China and India that are eager to balance their international investment position by diversifying their international reserves[10].

[10] In passing, we notice that although we try to include as many country samples as possible in our study, due to limited data availability, we were only able to collect data for 18 industrial and 27 developing countries. Most developing countries in our data sample are emerging markets, which exclude least developed and heavily indebted countries that are in great need of foreign capital to promote their economic growth. Had we include such countries in our study, our findings may have significant policy implication for those countries.

Appendix A: Country sample

Developed countries	Australia, Austria, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.
Developing countries	Algeria, Argentina, Azerbaijan, Brazil, Bulgaria, Chile, China, Colombia, Czech Republic, Hungary, India, Indonesia, Kazakhstan, Korea South, Malaysia, Mexico, Nigeria, Pakistan, Peru, Philippines, Poland, Russia, Slovak Republic, Thailand, Turkey, Venezuela, Vietnam.

Appendix B: Data – Definition and Source

Variable	Definition
FDI	The Logarithm of FDI flow to a host country in current USD [Data source: Economist Intelligence Unit (EIU)].
Cor	The corruption index, measured in scale from 1 to 6 with a higher value meaning higher corruption level in a country, in logarithm value [Data source: ICRG].
CorDist	The absolute value of the difference between home country and host country's corruption index, in logarithm value [Data source: ICRG].
CorDist $^{(+)}$	The absolute value of "corruption distance" between high corruption source country and low corruption host countries, in logarithm value [Data source: ICRG].
CorDist $^{(-)}$	The absolute value of "corruption distance" between low corruption source country and high corruption host countries, in logarithm value [Data source: ICRG].
GDP	Log of GDP in USD [Data source: World Economic Outlook (IMF)]
RGDPG	The real GDP growth rate [Data source: World Economic Outlook (IMF)].
Unempl	The unemployment rate [Data source: World Economic Outlook (IMF)].
Distance	Log of the greater circle distance between the capital cities of the host and source countries [Data source: CEPII, www.cepii.fr].
Language	Dummy indicator of the existence of a common language between the host and source country, 1 or 0 [Data source: CEPII, www.cepii.fr].
Legal	Dummy indicator of the existence of a common legal system between the host and source country, 1 or 0 [Data source: CEPII, www.cepii.fr].
Open	Trade openness (% of trade to GDP of host country) [Data source: World Development Indicators (WDI)].
Natural	The sum of energy depletion (% of GNI) and the mineral depletion (% of GNI) [Data source: World Development Indicators (WDI)].
Risk	The sum of 12 components of political risk in ICRG county risk index data except the score of corruption [Data source: ICRG].
Proc_Days	An index variable (= 1, if a country pair's sum of the number of days and procedures is above the median of the data sample; =0, otherwise.) [Data source: Djankov et al. (2002)]
Regulation_Cost	An index variable (= 1, if a country pair's sum of the relative costs is above the median of the data sample; =0, otherwise.) [Data source: Djankov et al. (2002)]
Trend	A time trend variable.

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Table 1: Results of corruption distance and FDI with full sample.

	A1	A2	B1	B2
CorDist(-1)	-0.112*	-0.133**	-0.061	-0.142**
	(0.06)	(0.06)	(0.07)	(0.06)
GDP_S(-1)	0.360***	0.291**	0.303***	0.415***
	(0.02)	(0.13)	(0.02)	(0.15)
GDP_H(-1)	0.247***	0.349***	0.303***	0.401***
	(0.02)	(0.12)	(0.03)	(0.15)
Distance	-0.549***	-0.624***	-0.491***	-0.740***
	(0.03)	(0.04)	(0.04)	(0.04)
Legal	0.229***	0.235***	0.270***	0.250***
	(0.09)	(0.05)	(0.09)	(0.05)
Language	0.049	0.794***	0.266*	0.893***
	(0.14)	(0.08)	(0.15)	(0.09)
Proc_ Days	-0.367***		-0.360***	
	(0.09)		(0.09)	
Regulation_Cost	-0.429***		-0.315***	
	(0.09)		(0.09)	
RGDPG_H(-1)			0.010	0.061**
			(0.02)	(0.03)
Cor_H(-1)			-0.025	0.001
			(0.06)	(0.12)
Risk_H(-1)			-0.009***	-0.006
			(0.00)	(0.01)
Natural_H(-1)			-0.056***	-0.016
			(0.01)	(0.05)
Open_H(-1)			0.346***	0.240
			(0.09)	(0.29)
Unempl_H(-1)			0.011*	-0.014
			(0.01)	(0.01)
Trend	-0.010**		-0.007	
	(0.01)		(0.01)	
Mills		-0.282**		0.032
		(0.11)		(0.13)
Constant	1.681***	9.246***	1.030**	9.375***
	(0.34)	(1.52)	(0.41)	(1.91)
R-squares		0.60		0.61
Obs.	19800	9867	15796	8145
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively

Table 2: Results of corruption distance and FDI with the sample of industrial source and industrial host country pair**.**

	A1	A2	B1	B2
CorDist(-1)	-0.045	-0.622***	-0.035	-0.729***
	(0.13)	(0.14)	(0.14)	(0.15)
GDP_S(-1)	0.207***	0.913**	0.186***	0.831*
	(0.03)	(0.44)	(0.03)	(0.47)
GDP_H(-1)	0.153***	0.322	0.156***	0.576
	(0.03)	(0.32)	(0.04)	(0.39)
Distance	-0.215***	-0.757***	-0.231***	-0.854***
	(0.03)	(0.08)	(0.04)	(0.09)
Legal	0.232*	0.575***	0.252*	0.561***
	(0.12)	(0.11)	(0.14)	(0.13)
Language	-0.105	0.262*	-0.070	0.515***
	(0.16)	(0.15)	(0.18)	(0.17)
Proc_ Days	-0.233		-0.297	
	(0.19)		(0.21)	
Regulation_Cost	0.678***		0.416*	
	(0.23)		(0.25)	
RGDPG_H(-1)			0.013	0.214***
			(0.04)	(0.06)
Cor_H(-1)			-0.352	-1.070**
			(0.24)	(0.44)
Risk_H(-1)			0.014	-0.006
			(0.01)	(0.02)
Natural_H(-1)			-0.022	-0.044
			(0.02)	(0.10)
Open_H(-1)			0.285	-0.254
			(0.22)	(1.01)
Unempl_H(-1)			0.008	-0.019
			(0.01)	(0.03)
Trend	-0.030***		-0.024**	
	(0.01)		(0.01)	
Mills		0.000		0.945
		(0.63)		(0.79)
Constant	0.320	6.228	0.607	8.485
	(0.38)	(5.14)	(0.75)	(5.66)
R-squares		0.63		0.64
Obs.	3060	2197	2589	1881
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 3: Results of corruption distance and FDI with the sample of industrial source and developing host country pair.

	A1	A2	B1	B2
CorDist(-1)	0.001	-0.082	-0.002	0.163
	(0.15)	(0.16)	(0.23)	(0.23)
GDP_S(-1)	0.600***	-0.428	0.632***	-0.128
	(0.06)	(0.35)	(0.07)	(0.38)
GDP_H(-1)	0.039	0.821***	0.209***	0.926***
	(0.06)	(0.17)	(0.08)	(0.22)
Distance	-0.452***	-1.138***	-0.343***	-1.294***
	(0.09)	(0.08)	(0.10)	(0.07)
Legal	0.295	0.359***	0.318	0.463***
	(0.22)	(0.10)	(0.25)	(0.11)
Language	-0.118	1.336***	0.640	1.714***
	(0.33)	(0.14)	(0.43)	(0.18)
Proc_ Days	0.142		0.043	
	(0.22)		(0.26)	
Regulation_Cost	-0.144		-0.211	
	(0.22)		(0.27)	
RGDPG_H(-1)			-0.100*	-0.093
			(0.06)	(0.06)
Cor_H(-1)			0.037	0.287
			(0.17)	(0.20)
Risk_H(-1)			-0.001	-0.008
			(0.01)	(0.02)
Natural_H(-1)			-0.090**	-0.209**
			(0.04)	(0.09)
Open_H(-1)			0.528***	0.764*
			(0.19)	(0.42)
Unempl_H(-1)			0.068***	0.012
			(0.01)	(0.02)
Trend	-0.001		0.004	
	(0.01)		(0.02)	
Mills		-0.185		0.696**
		(0.36)		(0.27)
Constant	0.337	15.282***	-3.152**	11.415***
	(0.84)	(3.33)	(1.23)	(3.68)
R-squares		0.63		0.63
Obs.	4860	2954	3376	2361
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 4: Results of corruption distance and FDI with the sample of developing source and developing host country pair.

	A1	A2	B1	B2
CorDist(-1)	-0.257**	-0.250	-0.223	-0.221
	(0.12)	(0.16)	(0.14)	(0.18)
GDP_S(-1)	0.334***	0.028	0.334***	0.051
	(0.05)	(0.19)	(0.06)	(0.23)
GDP_H(-1)	0.248***	0.210	0.282***	0.336
	(0.05)	(0.19)	(0.06)	(0.25)
Distance	-0.972***	-1.126***	-0.951***	-1.254***
	(0.08)	(0.10)	(0.09)	(0.10)
Legal	0.220	0.230***	0.216	0.265***
	(0.15)	(0.09)	(0.16)	(0.10)
Language	0.364	0.638***	0.565*	0.981***
	(0.27)	(0.14)	(0.30)	(0.18)
Proc_ Days	-0.806***		-0.887***	
	(0.14)		(0.16)	
Regulation_Cost	-0.400***		-0.328**	
	(0.14)		(0.15)	
RGDPG_H(-1)			0.072	-0.016
			(0.05)	(0.08)
Cor_H(-1)			-0.229**	-0.366**
			(0.11)	(0.18)
Risk_H(-1)			-0.008	-0.008
			(0.01)	(0.01)
Natural_H(-1)			-0.018	0.028
			(0.03)	(0.09)
Open_H(-1)			0.195	0.568
			(0.16)	(0.47)
Unempl_H(-1)			0.014	0.024
			(0.01)	(0.02)
Trend	0.021**		-0.007	
	(0.01)		(0.02)	
Mills		0.361**		0.544***
		(0.15)		(0.16)
Constant	5.141***	9.754***	5.415***	9.530***
	(0.74)	(1.35)	(0.90)	(1.96)
R-squares		0.48		0.50
Obs.	7020	2130	5290	1703
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 5: Results of corruption distance and FDI with the sample of developing source and industrial host country pair.

	A1	A2	B1	B2
CorDist(-1)	-0.177	-0.029	-0.245	-0.143
	(0.13)	(0.22)	(0.17)	(0.30)
GDP_S(-1)	0.054	0.896***	0.031	0.886***
	(0.04)	(0.21)	(0.05)	(0.25)
GDP_H(-1)	0.323***	0.291	0.466***	0.371
	(0.05)	(0.37)	(0.06)	(0.43)
Distance	-0.256***	-0.161	-0.145**	-0.027
	(0.07)	(0.12)	(0.07)	(0.09)
Legal	0.241	0.464***	0.226	0.447***
	(0.17)	(0.15)	(0.17)	(0.16)
Language	-0.416	0.324	-0.260	0.545**
	(0.27)	(0.26)	(0.26)	(0.22)
Proc_ Days	0.025		0.262	
	(0.17)		(0.18)	
Regulation_Cost	-0.322*		-0.153	
	(0.18)		(0.18)	
RGDPG_H(-1)			-0.027	0.101
			(0.03)	(0.07)
Cor_H(-1)			0.367	0.836
			(0.29)	(0.55)
Risk_H(-1)			-0.010**	-0.013
			(0.01)	(0.01)
Natural_H(-1)			-0.045*	0.030
			(0.03)	(0.10)
Open_H(-1)			1.125***	0.397
			(0.28)	(1.13)
Unempl_H(-1)			-0.035**	-0.025
			(0.02)	(0.04)
Trend	0.000		-0.014	
	(0.01)		(0.01)	
Mills		1.537**		1.165
		(0.75)		(0.72)
Constant	0.231	-2.261	-2.214**	-4.42
	(0.67)	(3.54)	(0.92)	(4.23)
R-squares		0.39		0.39
Obs.	4860	2586	4473	2339
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 6: Results of asymmetric effect of corruption distance on FDI with full sample.

	A1	A2	B1	B2
CorDist(+)	-0.209***	-0.200***	-0.130	-0.200**
	(0.07)	(0.08)	(0.08)	(0.08)
CorDist(-)	-0.135*	-0.045	-0.114	-0.037
	(0.07)	(0.07)	(0.08)	(0.09)
GDP_S(-1)	0.357***	0.336**	0.302***	0.412***
	(0.02)	(0.14)	(0.02)	(0.16)
GDP_H(-1)	0.258***	0.385***	0.308***	0.458***
	(0.02)	(0.13)	(0.03)	(0.16)
Distance	-0.550***	-0.623***	-0.489***	-0.723***
	(0.04)	(0.04)	(0.04)	(0.04)
Legal	0.206**	0.176***	0.242***	0.173***
	(0.09)	(0.05)	(0.09)	(0.05)
Language	0.031	0.826***	0.284*	0.915***
	(0.14)	(0.08)	(0.15)	(0.09)
Proc_ Days	-0.356***		-0.335***	
	(0.09)		(0.09)	
Regulation_Cost	-0.437***		-0.338***	
	(0.09)		(0.09)	
RGDPG_H(-1)			0.006	0.063**
			(0.02)	(0.03)
Cor_H(-1)			0.000	0.179
			(0.08)	(0.13)
Risk_H(-1)			-0.008***	-0.005
			(0.00)	(0.01)
Natural_H(-1)			-0.058***	-0.029
			(0.02)	(0.05)
Open_H(-1)			0.372***	0.281
			(0.09)	(0.30)
Unempl_H(-1)			0.011*	-0.019
			(0.01)	(0.01)
Trend	-0.011**		-0.006	
	(0.01)		(0.01)	
Mills		-0.267**		-0.025
		(0.12)		(0.14)
Constant	1.749***	8.667***	1.018**	8.467***
	(0.35)	(1.61)	(0.44)	(2.05)
R-squares		0.60		0.60
Obs.	18102	9065	14381	7477
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (5) and (6). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 7: Results of asymmetric effect of corruption distance on FDI with the sample of industrial source and industrial host country pair.

	A1	A2	B1	B2
CorDist(+)	0.002	-0.604***	-0.107	-0.705***
	(0.17)	(0.20)	(0.19)	(0.21)
CorDist(-)	0.020	-0.723***	-0.025	-0.930***
	(0.17)	(0.19)	(0.21)	(0.22)
GDP_S(-1)	0.214***	0.730	0.191***	0.479
	(0.04)	(0.55)	(0.04)	(0.58)
GDP_H(-1)	0.170***	0.457	0.189***	0.747*
	(0.04)	(0.34)	(0.05)	(0.42)
Distance	-0.222***	-0.744***	-0.224***	-0.805***
	(0.04)	(0.08)	(0.04)	(0.09)
Legal	0.230*	0.500***	0.238	0.448***
	(0.13)	(0.12)	(0.15)	(0.13)
Language	-0.131	0.235	-0.116	0.472**
	(0.17)	(0.16)	(0.20)	(0.19)
Proc_ Days	-0.245		-0.273	
	(0.20)		(0.23)	
Regulation_Cost	0.730***		0.481*	
	(0.26)		(0.27)	
RGDPG_H(-1)			-0.014	0.199***
			(0.04)	(0.07)
Cor_H(-1)			-0.292	-1.086**
			(0.33)	(0.54)
Risk_H(-1)			0.025**	-0.017
			(0.01)	(0.02)
Natural_H(-1)			-0.020	-0.090
			(0.02)	(0.09)
Open_H(-1)			0.443*	0.101
			(0.25)	(1.17)
Unempl_H(-1)			0.006	-0.028
			(0.02)	(0.03)
Trend	-0.034***		-0.033**	
	(0.01)		(0.01)	
Mills		0.169		0.635
		(0.68)		(0.84)
Constant	0.19	6.830	-0.078	10.038
	(0.44)	(5.75)	(1.00)	(6.64)
R-squares		0.64		0.65
Obs.	2610	1882	2227	1628
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (5) and (6). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 8: Results of asymmetric effect of corruption distance on FDI with the sample of industrial source and developing host country pair.

	A1	A2	B1	B2
CorDist(+)	-0.398	-0.368	-0.270	-0.041
	(0.25)	(0.23)	(0.32)	(0.27)
CorDist(-)	-0.216	-0.044	-0.038	0.420
	(0.17)	(0.20)	(0.27)	(0.29)
GDP_S(-1)	0.592***	-0.357	0.649***	-0.039
	(0.06)	(0.36)	(0.07)	(0.39)
GDP_H(-1)	0.068	0.855***	0.232***	1.027***
	(0.06)	(0.19)	(0.08)	(0.25)
Distance	-0.464***	-1.139***	-0.351***	-1.278***
	(0.09)	(0.08)	(0.10)	(0.06)
Legal	0.278	0.349***	0.328	0.416***
	(0.22)	(0.11)	(0.25)	(0.12)
Language	-0.125	1.332***	0.639	1.697***
	(0.33)	(0.16)	(0.43)	(0.20)
Proc_ Days	0.164		0.065	
	(0.23)		(0.27)	
Regulation_Cost	-0.184		-0.241	
	(0.22)		(0.27)	
RGDPG_H(-1)			-0.079	-0.049
			(0.06)	(0.06)
Cor_H(-1)			0.124	0.579***
			(0.19)	(0.21)
Risk_H(-1)			-0.006	-0.001
			(0.01)	(0.02)
Natural_H(-1)			-0.095***	-0.200**
			(0.04)	(0.09)
Open_H(-1)			0.549***	0.743*
			(0.19)	(0.43)
Unempl_H(-1)			0.065***	0.006
			(0.01)	(0.02)
Trend	-0.005		0.001	
	(0.01)		(0.02)	
Mills		-0.118		0.640**
		(0.35)		(0.26)
Constant	0.717	13.646***	-3.121**	8.956**
	(0.87)	(3.25)	(1.28)	(3.84)
R-squares		0.63		0.64
Obs.	4708	2846	3562	2270
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (5) and (6). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 9: Results of asymmetric effect of corruption distance on FDI with the sample of developing source and developing host country pair.

	A1	A2	B1	B2
CorDist(+)	-0.378**	-0.421**	-0.278	-0.270
	(0.15)	(0.20)	(0.18)	(0.22)
CorDist(-)	-0.338**	-0.180	-0.360**	-0.142
	(0.15)	(0.20)	(0.17)	(0.23)
GDP_S(-1)	0.324***	0.176	0.304***	0.125
	(0.05)	(0.20)	(0.06)	(0.26)
GDP_H(-1)	0.249***	0.246	0.271***	0.366
	(0.05)	(0.21)	(0.06)	(0.29)
Distance	-0.969***	-1.208***	-0.940***	-1.284***
	(0.08)	(0.10)	(0.09)	(0.10)
Legal	0.171	0.222**	0.151	0.193*
	(0.16)	(0.10)	(0.17)	(0.11)
Language	0.321	0.705***	0.628**	1.076***
	(0.28)	(0.16)	(0.30)	(0.19)
Proc_ Days	-0.780***		-0.834***	
	(0.15)		(0.16)	
Regulation_Cost	-0.417***		-0.341**	
	(0.14)		(0.16)	
RGDPG_H(-1)			0.082	0.014
			(0.05)	(0.07)
Cor_H(-1)			-0.281*	-0.335
			(0.15)	(0.23)
Risk_H(-1)			-0.010	-0.002
			(0.01)	(0.01)
Natural_H(-1)			-0.024	0.023
			(0.03)	(0.09)
Open_H(-1)			0.192	0.608
			(0.16)	(0.51)
Unempl_H(-1)			0.010	0.025
			(0.01)	(0.02)
Trend	0.024**		-0.004	
	(0.01)		(0.02)	
Mills		0.483***		0.591***
		(0.16)		(0.17)
Constant	5.280***	9.436***	5.823***	8.915***
	(0.78)	(1.55)	(0.95)	(2.36)
R-squares		0.49		0.52
Obs.	6083	1849	4626	1492
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (5) and (6). Robust errors are in parentheses underneath coefficient estimates. "***, **, *" indicate 1%, 5%, and 10% level of significance, respectively.

Table 10: Results of asymmetric effect of corruption distance on FDI with the sample of developing source and industrial host country pair.

	A1	A2	B1	B2
CorDist(+)	-0.221	-0.176	-0.340*	-0.460
	(0.14)	(0.26)	(0.20)	(0.36)
CorDist(-)	-0.276	-0.356	-0.494*	-0.632
	(0.22)	(0.30)	(0.26)	(0.41)
GDP_S(-1)	0.055	0.905***	0.031	0.927***
	(0.04)	(0.24)	(0.05)	(0.28)
GDP_H(-1)	0.322***	0.284	0.467***	0.395
	(0.05)	(0.37)	(0.06)	(0.44)
Distance	-0.255***	-0.166	-0.143**	-0.032
	(0.07)	(0.11)	(0.07)	(0.08)
Legal	0.228	0.479***	0.217	0.483***
	(0.18)	(0.14)	(0.17)	(0.15)
Language	-0.408	0.280	-0.256	0.493**
	(0.27)	(0.28)	(0.26)	(0.23)
Proc_ Days	-0.011		0.233	
	(0.18)		(0.18)	
Regulation_Cost	-0.325*		-0.159	
	(0.18)		(0.18)	
RGDPG_H(-1)			-0.030	0.098
			(0.03)	(0.07)
Cor_H(-1)			0.456	1.112*
			(0.31)	(0.58)
Risk_H(-1)			-0.011**	-0.014
			(0.01)	(0.01)
Natural_H(-1)			-0.046*	0.046
			(0.03)	(0.10)
Open_H(-1)			1.131***	0.595
			(0.28)	(1.21)
Unempl_H(-1)			-0.031**	-0.021
			(0.02)	(0.04)
Trend	-0.003		-0.015	
	(0.01)		(0.01)	
Mills		1.595**		1.325*
		(0.72)		(0.71)
Constant	0.322	-2.391	-2.234**	-4.802
	(0.69)	(3.36)	(0.94)	(4.25)
R-squares		0.39		0.40
Obs.	4701	2488	4323	2246
Country effect		yes		yes
Year effect		yes		yes

Notes: The table reports the results of estimating equation (5) and (6). Robust errors are in parentheses underneath coefficient estimates. “***, **, *” indicate 1%, 5%, and 10% level of significance, respectively.