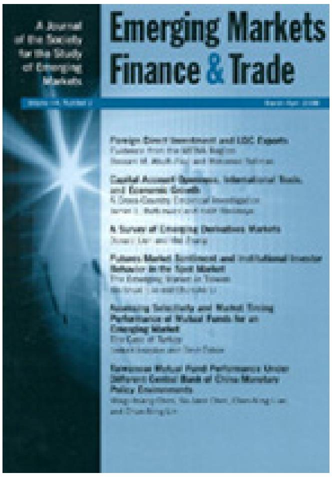

Emerging Markets Finance and Trade
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/mree20

Corruption Distance and Foreign Direct Investment

Xingwang Qian[a] & Jesus Sandoval-Hernandez[b]

[a] Economics and Finance Department, SUNY Buffalo State, Buffalo, New York, USA

[b] School of Social Sciences Humanities and Arts, University of California, Merced, Merced, California, USA

Published online: 01 Jun 2015.

Emerging Markets Finance & Trade, 1–20, 2015

ISSN: 1540-496X print/1558-0938 online
DOI: 10.1080/1540496X.2015.1047301

Routledge
Taylor & Francis Group

Corruption Distance and Foreign Direct Investment

Xingwang Qian[1] and Jesus Sandoval-Hernandez[2]

[1]*Economics and Finance Department, SUNY Buffalo State, Buffalo, New York, USA;* [2]*School of Social Sciences Humanities and Arts, University of California, Merced, Merced, California, USA*

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 forty-five countries from 1997 to 2007, we find that corruption distance adversely influences both the likelihood of FDI and the volume of FDI. A novel finding in 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.

KEY WORDS: foreign direct investment, corruption, developing countries

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 percent 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; Mehic et al. 2013).

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 2000; 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 2000; Habib and Zurawick 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 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

---

Address correspondence to Xingwang Qian, Economics and Finance Department, SUNY Buffalo State, Buffalo, NY 14222, USA. E-mail: qianx@buffalostate.edu

"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 article, we study the association between corruption distance and FDI. Our analysis employs gravity specifications on a sample of forty-five 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" (Razin, Rubinstein, and Sadka 2003; Razin, Sadka, and Tong, 2005; Helpman, Melitz, and Rubinstein 2008). 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 article 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 three years (1996–1998). More important, 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 article 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 important, 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 article is organized as follows. In the second section, we describe the data and some issues associated with it. Thr third section presents the empirical estimate models—the basic and augmented gravity models, and the regression results. The last section provides the concluding remarks.

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 forty-five countries, including eighteen industrial and twenty-seven developing and transition economies[5], from 1997 to 2007. The size of the sample is limited by data availability. 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 sixty largest economies in the world, accounting for over 95 percent 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 U.S. 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 percent 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 U.S. 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.[6] 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.[7] 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.

Estimation and Results

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 (Brainard 1993; Markusen and Venables 2000; Anderson and van Wincoop 2003). These models postulate that bilateral 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 (Wei 2000; Habib and Zurawicki 2002; Head and Ries 2008; Razin et al. 2005).

Due to the zero-censored structure of our data (about 59 percent 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 (Razin, Rubinstein, and Sadka 2003; Razin, Sadka, and Tong 2005; Helpman, Melitz, and Rubinstein 2007). The Heckman two-stage method (Heckman 1979) provides 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 investors' 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,

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

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, $|Cor_{i,t-1} - Cor_{j,t-1}|$ to generate the needed data series. However, because 23 percent 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 $\log(|Cor_{i,t-1} - Cor_{j,t-1}| + 2)$ 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 $\log(|Cor_{i,t-1} - Cor_{j,t-1}| + 2)$ 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.

For robustness, we constructed alternative measures of corruption distance using three other measures of perceived corruption: CCI from the World Bank, CPI by Transparency International (TI), and FCI from the Heritage Foundation. We run regressions on the whole sample of country pairs and periods using these new corruption distance measures. Overall, the main results stand. The results are available upon request.

$X_{ij,t-1}$ 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 A.

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, which 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.[8] 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; that is, at least one variable from the first stage estimation should be excluded in the second stage. 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. *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 Wooldridge (1995) procedure that extends the Heckman method to panel data. Specifically, we use the panel data Probit regression with random effects[9] 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 percent 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 percent increase in corruption distance reduces the likelihood of FDI by about 0.1 percent. 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 $FDI_{ij,t}$ 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

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 Equations (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. ***, **, * indicate 1%, 5%, and 10% level of significance, respectively.

Mills ratio is estimated to be significant—there is 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 percent.

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, *Ceteris paribus*.

Indeed, 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 the 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 percent of the bilateral FDI variation.

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.[10] 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. 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. However, the 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.

In addition to corruption, FDI could be adversely affected by the presence of other risk factors related to the quality of institutions (Bénassy-Quéré et al. 2007; Busse and Hefeker 2007; Cheung and Qian 2009; Baek and Qian 2011; Cheung et al. 2012). We include the political system risk index, *Risk_H*, to measure the overall political risk level from *International Country Risk Guide* (ICRG). 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 endogeneity 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*) does not reduce the likelihood of FDI. 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 percent to 61 percent.

Estimation With Different FDI Source and Host Country Sample

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 United States instead of that of Saudi Arabia, a nondemocratic less developed country.[11]

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)[12], 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. Aleksynska and Havrylchyk (2013) confirm that investors from developed countries are deterred by a larger institutional difference between source and host 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.

In some cases, multinationals from developing countries may be seeking efficiency when consider to invest into an industrial country. These firms try to have access to cutting-age technologies and managerial know-how via FDI. Such efficient seeking motive may overshadow the effects of other factors, including corruption. To control for this efficiency seeking motive of FDI, we add an additional variable to the regressions on the developing-industrial source-host sample. This variable is the research and development distance between a developing source and an industrial host (R&D_Dist). We expect that a larger distance of R&D will increase FDI flows from a developing to industrial countries. The results are reported in Table 5. We do not find that the R&D distance exerts a significant effect on FDI decision in our regression analyses though. The corruption distance, however, significantly reduces the likelihood of FDI from developing countries to industrial economies. But, it does not affect the volume of FDI decision making, as the coefficients of corruption distance in the second stage of both gravity models are not significant.

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 Equations (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. ***, **, * indicate 1%, 5%, and 10% level of significance, respectively.

In sum, the corruption distance may matter when an industrial nation invests in its industrial peer and a developing nation invests in its developing peer or a high corrupt industrial country. These results echo the finding of Ledyaeva et al (2013) that those FDIs from more corrupt and nondemocratic countries tend to invest in more corrupt and less democratic Russian regions. Moreover, in addition to the adverse effect of corruption distance, the corruption level significantly reduces the

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 Equations (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. ***, **, * indicate 1%, 5%, and 10% level of significance, respectively.

volume of FDI, when the same group countries invest each other. We find little evidence that industrial FDI flows to a developing country is affected by corruption distance.

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 corruption

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 Equations (1), (2), (3), and (4). Robust errors are in parentheses underneath coefficient estimates. ***, **, * indicate 1%, 5%, and 10% level of significance, respectively.

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

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)	–0.602***	0.000	–0.851***	–0.192
	(0.19)	(0.38)	(0.27)	(0.51)
GDP_S(–1)	0.078	0.584**	0.052	0.896***
	(0.06)	(0.29)	(0.06)	(0.35)
GDP_H(–1)	0.408***	0.417	0.599***	0.158
	(0.07)	(0.51)	(0.08)	(0.61)
Distance	–0.499***	–0.056	–0.453***	–0.119
	(0.12)	(0.22)	(0.12)	(0.20)
Legal	0.318	–0.064	0.285	–0.032
	(0.27)	(0.22)	(0.26)	(0.23)
Language	–0.634	0.270	–0.394	0.173
	(0.40)	(0.42)	(0.38)	(0.38)
R&D_Dist(–1)	–0.013	–0.004	–0.038	–0.014
	(0.05)	(0.04)	(0.05)	(0.05)
Proc_ Days	–0.126		0.238	
	(0.26)		(0.26)	
Regulation_Cost	–0.178		0.026	
	(0.26)		(0.25)	
RGDPG_H(–1)			–0.094**	0.188*
			(0.05)	(0.10)
Cor_H(–1)			1.105**	0.669
			(0.43)	(0.88)
Risk_H(–1)			–0.022***	–0.006
			(0.01)	(0.02)
Natural_H(–1)			–0.018	0.414**
			(0.04)	(0.18)
Open_H(–1)			1.178***	–1.850
			(0.41)	(1.61)
Unempl_H(–1)			–0.046**	–0.038
			(0.02)	(0.05)
Trend	–0.022		–0.053***	
	(0.01)		(0.02)	
Mills		–0.385		–0.190
		(0.78)		(0.70)
Constant	2.366**	–1.584	–0.345	1.511
	(1.20)	(4.76)	(1.46)	(5.88)
R-squares		0.37		0.38
Obs.	2511	1274	2284	1124
Country effect		yes		yes
Year effect		yes		yes

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

corruption distance, positive and negative corruption distance perhaps have different impact on the firm's decision. Indeed, as we confirmed in the previous section, when FDI flows from industrial countries to their industrial peers or from developing to developing countries pairs, in addition to the corruption distance, the corruption level also reduces the volume of FDI, indicating that the "dirtier" host does deter the FDI from the "cleaner" source; but not vice versa. In other words, the effect of corruption distance may have direction and it affect bilateral FDI asymmetrically.

Given the above arguments, we propose an original hypothesis that there are asymmetric effects of corruption distance to the bilateral FDI. To examine the 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.

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

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

where $CorDist(+)_{ij,t-1}$ and $CorDist(-)_{ij,t}$, denote the positive and negative corruption distance, respectively. The measure of both $CorDist(+)_{ij,t-1}$ and $CorDist(-)_{ij,t}$ are the same as $CorDist_{ij,t-1}$, except that $CorDist(+)_{ij,t-1}$ contains the positive corruption distance, whereas $CorDist(-)_{ij,t}$ has the negative distance. 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.

The columns A1 and A2 of Table 6 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 significance of coefficients of the positive and negative corruption distances are markedly different.

In the basic gravity model, the positive corruption distances are significant at the 5 percent level, whereas the estimates for the negative corruption distance are not significant in both stages. Furthermore, the coefficient value of the positive corruption distance is substantially 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 both the likelihood and 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 where the host country pull factors are added, although the positive corruption distance is reduced to be insignificant in the first stages, both the value and the significance of the positive corruption distance coefficient are enhanced in the second stage. On the other hand, the negative corruption distances in both stages remain insignificant. 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.

Compared to the results presented in Table 1 that the overall corruption distance adversely affects FDI, Table 6 shows similar adverse effect of the positive corruption distance to FDI. It indicates that 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. In contrast, the negative corruption distance imposes no significant effect on FDI. Thus, we suggest that the positive and negative corruption distance affect FDI asymmetrically 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 A2, with the estimates of

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

	A1	A2	B1	B2
CorDist(+)	–0.084**	–0.157***	–0.022	–0.172***
	(0.04)	(0.05)	(0.05)	(0.06)
CorDist(–1)	–0.002	–0.011	–0.007	–0.012
	(0.04)	(0.05)	(0.05)	(0.06)
GDP_S(–1)	0.356***	0.343***	0.303***	0.464***
	(0.02)	(0.13)	(0.02)	(0.15)
GDP_H(–1)	0.254***	0.336***	0.304***	0.403***
	(0.02)	(0.12)	(0.03)	(0.15)
Distance	–0.549***	–0.650***	–0.491***	–0.748***
	(0.03)	(0.04)	(0.04)	(0.04)
Legal	0.234***	0.244***	0.274***	0.256***
	(0.09)	(0.05)	(0.09)	(0.05)
Language	0.045	0.795***	0.264*	0.898***
	(0.14)	(0.08)	(0.15)	(0.09)
Proc_ Days	–0.357***		–0.354***	
	(0.09)		(0.09)	
Regulation_Cost	–0.422***		–0.309***	
	(0.09)		(0.09)	
RGDPG_H(–1)			0.010	0.064**
			(0.02)	(0.03)
Cor_H(–1)			–0.014	0.126
			(0.08)	(0.13)
Risk_H(–1)			–0.008***	–0.005
			(0.00)	(0.01)
Natural_H(–1)			–0.056***	–0.009
			(0.01)	(0.05)
Open_H(–1)			0.346***	0.242
			(0.09)	(0.29)
Unempl_H(–1)			0.011*	–0.014
			(0.01)	(0.01)
Trend	–0.010**		–0.006	
	(0.01)		(0.01)	
Mills		–0.196*		0.057
		(0.11)		(0.13)
Constant	1.578***	9.084***	0.947**	8.733***
	(0.33)	(1.52)	(0.42)	(1.93)
R-squares		0.60		0.60
Obs.	19800	9867	15728	8101
Country effect		yes		yes
Year effect		yes		yes

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

positive distance from Table 6, column A2, we find that the latter exerts a greater degree of reduction effect to the volume of FDI. Overall, separating the positive and negative distance provides us with a better framework to scrutinize and reveal itemized information about how corruption distance affects bilateral FDI behavior.

We now examine how the asymmetric effect of corruption distance may vary due to different source and host pair. In doing so, 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 Table 7, Panels I to IV. Overall, we find some evidence of asymmetric effect of corruption distance; however both the magnitude and the significance of such asymmetric effect differ across different country pair samples. For example, in the industrial–industrial pair sub-sample (Panel I of Table 7), both positive and negative corruption distances are found to reduce the volume of bilateral FDI. However, it appears that the reduction effect for a negative corruption distance is stronger than the one from the positive corruption distance. We do not find significant evidence that the corruption distance affect the likelihood of FDI decision asymmetrically when industrial countries invest each other. When an industrial country invest a developing host, the asymmetric effect seems quite different from when it invests its industrial peers. The positive corruption distances are estimated to be negative in all four regressions (Panel II of Table 7), as expected. However, all negative corruption distance are positive, not significant though. Thus, there

Table 7. Results of asymmetric effect of corruption distance on FDI with sub-samples

***Panel I*: Industrial source and industrial host country pair**

	A1	A2	B1	B2
CorDist(+)	–0.057	–0.268***	–0.046	–0.260**
	(0.08)	(0.09)	(0.09)	(0.11)
CorDist(–)	–0.016	–0.293***	0.058	–0.373***
	(0.08)	(0.10)	(0.10)	(0.12)

***Panel II*: Industrial source and developing host country pair**

	A1	A2	B1	B2
CorDist(+)	–0.082	–0.289*	–0.169	–0.198
	(0.19)	(0.17)	(0.22)	(0.19)
CorDist(–)	0.113	0.027	0.104	0.249
	(0.11)	(0.12)	(0.16)	(0.16)

***Panel III*: Developing source and developing host country pair**

	A1	A2	B1	B2
CorDist(+)	–0.100	–0.221**	–0.012	–0.224*
	(0.07)	(0.09)	(0.09)	(0.12)
CorDist(–)	–0.057	0.001	–0.101	–0.031
	(0.07)	(0.09)	(0.09)	(0.11)

***Panel IV*: Developing source and industrial host country pair**

	A1	A2	B1	B2
CorDist(+)	–0.298**	–0.094	–0.307*	–0.369
	(0.14)	(0.24)	(0.19)	(0.29)
CorDist(–)	–0.291	–0.064	–0.832*	–0.273
	(0.37)	(0.36)	(0.45)	(0.52)

Notes: The table reports the results of estimating Equations (5) and (6). Robust errors are in parentheses underneath coefficient estimates. ***, **, * indicate 1%, 5%, and 10% level of significance, respectively. The results of all other relevant variables are not reported to save space. Readers are referred to our working paper version, Qian and Sandoval-Hernandez (2013), for detailed results.

might be some evidence that positive and negative corruption distance affects FDI asymmetrically, but statistically this evidence is rather weak. In fact, only in Column A2 of Panel II, Table 7, it appears to be significant at 10 percent level.

As reported in Panel III and IV of Table 7, when the FDI from a developing source invests in either developing or industrial hosts, the revealed asymmetric effect is more comparable to what we observed in the full sample—the positive corruption distance plays the prominent role in affecting the FDI behavior. It is the positive corruption distance between developing nations that significantly reduce the bilateral FDI, while the negative corruption distance imposes no effect, statistically. Recall that in Table 4 we find that, besides the corruption distance, the corruption level of a host developing country adversely affect the FDI from a developing country as well. This result reinforces our finding that there are asymmetric effects of corruption distance, particularly when developing countries invest in other developing countries.

In studying the asymmetric effect of corruption when a developing country invests in industrial countries (Panel IV), we find an interesting situation. In the basic gravity model, it is the positive corruption distance that mainly affects FDI behavior (Column A1 and A2). However, when the pull factors of the host country are added, it seems that the negative corruption distance affects the likelihood of FDI more than that of the positive corruption distance (Column B1). The effect of both positive and negative corruption distances are similar in deciding the volume of FDI in the second stage (Column A2 and B2); all of them are statistically insignificant.

To summarize, we find asymmetric effects of positive and negative corruption distance and the positive corruption distance is the one that affects the behavior of bilateral FDI prominently. However, the magnitude and the significance of such asymmetric effects depend on which sub-sample we are using. The asymmetric effect appears to be stronger when a developing source invests than an industrial source does. In addition, the asymmetric effects may only materialize in different FDI decision stages. For instance, the asymmetric effects only affect the second stage when a developing country invests in a developing host, while it realizes only in the first stage when that developing country invests in an industrial country.

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 on how much to be invested when developing country investors consider allocating FDI in an industrial host.

As a novel contribution to the FDI literature, 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 article, 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 necessary to focus only on the FDI from industrial countries; instead, they perhaps adjust their policies to attract more FDI from developing countries sharing 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.

Notes

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.
3. For example, Johanson and Wiedersheim-Paul (1975) and Johanson and Vahlne (1977, 1990).
4. Ghemawat (2001) suggests four dimensions of distance, namely cultural, administrative, geographic, and economics. The corruption distance is one type of administrative distance.
5. Industrial countries include Australia, Austria, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States. Developing countries are 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, and Vietnam.
6. The main results do not differ significantly when we exclude from our analysis the missing observations. Those results are available from authors upon request.
7. For a detailed description of the ICRG data see Knack and Keefer (1995).
8. 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.
9. The fixed effect specification would generate biased estimates under the censored specification (Greene 2004a, 2004b).
10. For a review of the literature on trade and FDI, see Blonigen (2005).
11. Ledyaeva et al. (2013), present compelling evidence on the positive effects on commonality of corruption and democracy in source countries with Russian regions.
12. For a discussion of the "South-South FDI" see Aleksynska and Havrylchyk (2013) and the references there in.

Acknowledgments

We thank Jakob de Haan, Hong Ma, participants of Tsinghua University winter meeting 2012, seminar participants in the University of California, Merced, and SUNY Buffalo State, and two anonymous referees, for their comments and suggestions.

Funding

Qian gratefully acknowledges the financial support from the School of Natural and Social Sciences at SUNY Buffalo State.

References

Aisbett E. 2009. "Bilateral Investment Treaties and Foreign Direct Investment: Correlation Versus Causation." In *The Effect of Treaties on Foreign Direct Investment: Bilateral Investment Treaties, Double Taxation Treaties and Investment Flows*, eds. Karl Sauvant, and Lisa Sachs, pp. 395–437. New York: Oxford University Press.

Aizenman, J., and I. Noy. 2006. "FDI and Trade-Two-Way Linkages? " *The Quarterly Review of Economics and Finance* 46, no. 3: 317–337.
Aleksynska, M.O., and Havrylchyk. 2013. "FDI from the South: The Role of Institutional Distance and Natural Resources." *European Journal of Political Economy* 29, no. 1: 38–53.
Alesina, A., and B. Weder, 2002, "Do Corrupt Governments Receive Less Foreign Aid?" *American Economic Review* 92, no. 4: 1126–1137.
Anderson J.E., and E. van Wincoop. 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* 93, no. 1: 170–192.
Baek, K. and X. Qian. 2011. "An Analysis on Political Risks and the Flow of Foreign Direct Investment in Developing and Industrial Economies." *Economics, Management and Financial Markets* 6, no. 4: 60–91.
Bénassy-Quéré, A.; M. Coupet; and T. Mayer. 2007. "Institutional Determinants of Foreign Direct Investment." *The World Economy* 30, no. 5: 764–782.
Brainard, L. 1993. "A Simple Theory of Multinational Corporations and Trade with a Trade-Off Between Proximity and Concentration." Working Paper 4269, National Bureau of Economic Research, Cambridge, MA.
Blonigen, B. 2005. "A Review of the Empirical Literature on FDI Determinants." *Atlantic Economic Journal* 33, no. 4: 383–403.
Borensztein, E.; J. De Gregorio; and J.-W. Lee. 1998. "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics* 45, no. 1: 115–135.
Busse, M., and C. Hefeker. 2007. "Political Risk, Institutions and Foreign Direct Investment." *European Journal of Political Economy* 23, no. 2: 397–415.
Cheung, Y.W., and X. Qian. 2009. "*Empirics of China's Outward Direct Investment*." *Pacific Economic Review* 14, no. 3: 312–41.
Cheung, Y.W.; J. de Haan; X. Qian; and Y. Shu. 2012. "China's Outward Direct Investment in Africa." *Review of International Economics* 20, no. 2: 201–220.
Cuervo-Cazurra, A. 2006. "Who Cares About Corruption?" *Journal of International Business Studies* 37, no. 6: 807–822.
Djankov, S.; R. La Porta; F. Lopez-de-Silanes; and A. Shleifer. 2002. "The Regulation of Entry." *Quarterly Journal of Economics* 117, no. 1, 1–37.
Eichengreen, B., and D. Irwin. 1995. "Trade Blocks, Currency Blocs and the Reorientation of Trade in the 1930s." *Journal of International Economics* 38, nos. 1–2:1–24.
Egger, P., and H. Winner. 2005. "Evidence on Corruption as an Incentive for Foreign Direct Investment." *European Journal of Political Economy* 21, no. 4: 932–952.
Ghemawat, P. 2001. "Distance Still Matters: The Hard Reality of Global Expansion." *Harvard Business Review* 79, no. 8: 137–147.
Glass, A., and X. Wu. 2002. "Does Corruption Discourage Foreign Direct Investment and Innovation?" Unpublished Working paper. College Station: Texas A&M University.
Greene, W. 2004a. "Fixed Effects and Bias Due to the Incidental Parameters Problem in the Tobit Model." *Econometric Reviews* 23, no. 2: 125–147.
——— 2004b. "The Behavior of the Fixed Effects Estimator in Nonlinear Models." *Econometrics Journal* 7, no. 1: 98–119.
Habib, M., and L. Zurawicki. 2002. "Corruption and foreign direct investment." Journal of *International Business Studies* 33, no. 2: 291–307.
Hansen, H., and Rand, J. 2006. "On the Causal Links Between FDI and Growth in Developing Countries." *The World Economy* 29, no. 1: 21–41.
Hattari, R., and R. Rajan. 2009. "Understanding Bilateral FDI Flows in Developing Asia." *Asian Pacific Economic Literature* 23, no. 2: 73–3.
Head, K., and J. Ries. 2008. "FDI as an Outcome of the Market for Corporate Control: Theory and Evidence." *Journal of International Economics* 47, no. 1: 2–20.
Heckman, J. J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47, no. 1: 153–161.
Helpman, E.; M. Melitz; and Y. Rubinstein. 2008. "Estimating Trade Flows: Trading Partners and Trading Volumes." *Quarterly Journal of Economics* 123, no. 2: 441–487.
Johanson, J., and J. Vahlne. 1977. "The Internationalization Process of the Firm-A Model of Knowledge Development and Increasing Foreign Market Commitment." *Journal of International Business Studies* 8, no. 1: 23–32.
———. 1990. "The Mechanism of Internationalization." *International Marketing Review* 7, no. 4: 11–24.
Johanson, J., and F. Wiedersheim-Paul. 1975. "The Internationalization of the Firm—Four Swedish Cases." *Journal of Management Studies* 8, no. 1: 305–322.
Knack, S., and P. Keefer. 1995. "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7, no. 3: 207–227.
Kravis, I. B., and R.E. Lipsey. 1982. "Location of Overseas Production and Production for Export by U.S. Multinational Firms." *Journal of International Economics* 12, nos. 3–4: 201–223.
Lambsdorff, J.G. 2003. "How Corruption Affects Persistent Capital Flows." *Economics of Governance* 4, no. 3: 229–243.
Ledyaeva, S.; P. Karhunen; and R. Kosonen. 2013. "Birds of a Feather: Evidence on Commonality of Corruption and Democracy in the Origin and Location of Foreign Investment in Russian Regions." *European Journal of Political Economy* 32, no. 1: 1–25.
Lipsey, R. E. 1999. "The Location and Characteristics of U.S. Affiliates in Asia." Working Paper 6876, National Bureau of Economic Research, Cambridge MA.
Lui F.T. 1985. "An Equilibrium Queuing Model of Bribery," *Journal of Political Economy* 93, no. 4: 760–781.
Markusen, J.R., and A.J. Venables. 2000. "The Theory of Endowment, Intra-Industry and Multinational Trade." *Journal of International Economics* 52, no. 2: 209–234.
Mauro, P. 1995. "Corruption and Growth." *Quarterly Journal of Economics* 110, no. 3: 681–712.

McKinsey Global Institute. 2011. "Mapping Global Capital Markets." McKinsey and Company.
Mehic, E.; S. Silajdzic; and V. Babic-Hodovic. 2013. "The Impact of FDI on Economic Growth: Some Evidence from Southeast Europe." *Emerging Markets Finance & Trade* 49, supp. no.1: 5–20.
Olson M. 1993. "Dictatorship, Democracy, and Development." *American Political Science Review* 87, no. 3: 567–576.
Qian X., and J. Sandoval-Hernandez. 2013. "Corruption Distance and Foreign Direct Investment." Working paper, Buffalo: SUNY Buffalo State.
Razin, A.; Y. Rubinstein; and E. Sadka. 2003. "Which Countries Export FDI, and How Much?" Working Paper 10145, National Bureau of Economic Research, Cambridge, MA.
Razin, A.; E. Sadka; and H. Tong. 2005. "Bilateral FDI Flows: Threshold Barriers and Productivity Shocks." Working Paper 11639, National Bureau of Economic Research, Cambridge, MA.
Seldadyo, H., and J. de Haan. 2011. "Is Corruption Really Persistent?" *Pacific Economic Review* 16, no. 2: 196–206.
Tanzi, V., and H. Davoodi. 2000. "Corruption, Growth, and Public Finances." Working Paper no. 00/182, International Monetary Fund.
Transparency International. 2011. "Corruption Perception Index, 2011." (available at http://www.transparency.org/cpi2011/results).
UNCTAD. 2006. *World Investment Report*. New York and Geneva: United Nations.
Wei, S. 2000. "How Taxing Is Corruption on International Investors?" *Review of Economics and Statistics* 82, no.1: 1–11.
Wheeler, D., and A. Mody. 1992. "International Investment Location Decisions: TheCase of U.S. Firms." *Journal of International Economics* 33, no. 1–2: 57–76.
Wooldridge, J. M. 1995. "Selection Corrections for Panel Data Models Under Conditional Mean Independence Assumptions." *Journal of Econometrics* 68, no. 1: 115–132.

Appendix A

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].
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].
R&D_Dist	Log of the absolute difference in Research and Development between the source and host country. R&D is the share of R&D expense in GDP [Data source: World Development Indicators (WDI)].
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 twelve 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.