The Effects of Corruption on FDI Inflows

Ali Al-Sadig

The surge in foreign direct investment (FDI) flows during the 1990s has motivated a host of recent studies into their determinants. Recently, the level of corruption in the host country has been introduced as one factor among the determinants of FDI location. From a theoretical viewpoint, corruption—that is, paying bribes to corrupt government bureaucrats to get "favors" such as permits, investment licenses, tax assessments, and police protection—is generally viewed as an additional cost of doing business or a tax on profits. As a result, corruption can be expected to decrease the expected profitability of investment projects. Investors will therefore take the level of corruption in a host country into account in making decisions to invest abroad.

The empirical literature on the effects of the host country's corruption level on FDI inflows, however, has not found the commonly expected effects. Some empirical studies provide evidence of a negative link between corruption and FDI inflows, while others fail to find any significant relationship.

Most existing studies use a cross-sectional rather than a panel data analysis to examine the effects of a complex phenomenon. Such a method cannot control for the unobserved country-specific effects

Cato Journal, Vol. 29, No. 2 (Spring/Summer 2009).

Ali Al-Sadig is an economic researcher at the Saudi Arabian Monetary Agency (SAMA). He thanks Timothy Hatton and George Symeonidis for supervising his dissertation, upon which this article draws. He also acknowledges helpful comments from Santos Silva and from participants at the Research Student Seminar, Department of Economics, University of Essex. The views expressed in this article are those of the author and not necessarily those of SAMA.

that may vary across countries and may be correlated with corruption. Even if a panel data analysis is implemented, those studies have ignored the fact that corruption is not necessarily an independent variable. It is a consequence of economic and noneconomic variables and so must be treated as an endogenous variable.

Motivated by these issues, the main objective of this article is to empirically reexamine the effects of corruption on FDI inflows by incorporating an econometric method based on panel data from 117 host countries over the period 1984–2004. More precisely, this article intends to answer the following question: Does a corrupt host country receive less or more FDI inflows after controlling for other determinants of FDI location?

Our results show that the corruption level in the host country has an adverse effect on FDI inflows: a one-point increase in the corruption level leads to a reduction in per capita FDI inflows by about 11 percent. However, after controlling for other characteristics of the host country such as the quality of institutions, the negative effects of corruption disappear and sometimes it becomes positive but statistically insignificant.

In fact, the results show that the country's quality of institutions is more important than the level of corruption in encouraging FDI inflows into the country. For instance, ceteris paribus, a country with sound institutions is able to attract as much as 29 percent more per capita FDI inflows than a country with poor institutions.

FDI Inflows and Corruption

Due to the various forms that corruption can take, including practices such as bribery, extortion, influence, fraud, and embezzlement, corruption has been defined in different ways. Yet, since we are concerned only with corruption that affects the costs of investment operations, we use Macrae's (1982: 679) definition. He defines corruption as an "arrangement" that involves "a private exchange between two parties (the 'demander' and the 'supplier'), which (1) has an influence on the allocation of resources either immediately or in the future, and (2) involves the use or abuse of public or collective responsibility for private ends." The demanders in our case may be the public officials and the suppliers are foreign investors.

The debate on the adverse effects of the level of corruption on FDI inflows has been analyzed in context of the costs of doing busi-

ness. Since foreign investors have to pay extra costs in the form of bribes in order to get licenses or government permits to conduct investment, corruption raises the costs of investment. Such additional costs decrease the expected profitability of investment and so corruption is generally viewed as a tax on profits (Bardhan 1997). Moreover, corruption increases uncertainty because corruption agreements are not enforceable in the courts of law.

It has been shown that corruption has adverse effects on economic performance.[1] Corruption has a negative impact on the level of investment and economic growth (Mauro 1995), on the quality of infrastructure and on the productivity of public investment (Tanzi and Davoodi 1997), on health care and education services (Gupta, Davoodi, and Tiongson 2000), and on income inequality (Gupta, Davoodi, and Alonso-Terme 1998; Li, Xu, and Zou 2000). All those factors are found to be important determinants of FDI location. Therefore, foreign investors would tend to avoid investing in countries with high levels of corruption.

However, there may exist positive effects of corruption on FDI inflows. In the presence of a rigid regulation and an inefficient bureaucracy, corruption may increase bureaucratic efficiency by speeding up the process of decisionmaking (Bardhan 1997). However, this view has been rejected empirically. Kaufman and Wei (1999) using firm level data covering more than 2,000 firms find that firms paying more bribes spend more time negotiating with bureaucrats. But two recent studies show that the effects of corruption depend on the country's rule of law and economic freedom. Houston (2007), studying the effects of corruption on a country's economic performance, finds that corruption has positive effects on economic growth in countries with a weak rule of law, while it has negative effects in countries with sound institutions. Also, Swaleheen and Stansel (2007) find that corruption enhances economic growth in countries with high economic freedom, while it hinders economic growth in countries with low economic freedom.

Previous Empirical Studies

The empirical literature on the relationship between corruption and FDI has not reached the commonly expected conclusion that a

[1]The World Bank identifies corruption as "the most single obstacle to economic development."

perceived high level of corruption in the host country deters FDI. In a study of foreign investment by U.S. firms, Wheeler and Mody (1992: 70) did not find a significant relationship between the size of FDI and the host country's risk factor, and they concluded that the importance of the risk factor should "be discounted, although it would not be impossible to assign it some small weight as a decision factor." Wei (2000a), however, argues that the reason why Wheeler and Mody (1992) failed to find a significant relationship between corruption and FDI is that corruption is not explicitly incorporated into their model. They combined corruption with 12 other indicators to form one variable, but some of these indicators may be marginally important for FDI.

Hines (1995) examines the effect of the U.S. anti-bribery legislation (Foreign Corrupt Practices Act of 1977) on the operation of U.S. firms in countries where corruption is high. He uses the growth rate of U.S. FDI flows into 35 host countries over the period 1977 to 1982 as the dependent variable and the Business International Index as a measure of corruption. His finding suggests that the Corrupt Practices Act significantly reduced U.S. FDI flows into more corrupt host countries after 1977.[2]

Abed and Davoodi (2000) use a cross-sectional as well as a panel data analysis to examine the effects of levels of corruption on per capita FDI inflows to transition economies. They find that countries with a low level of corruption attract more per capita FDI. However, once they control for the structural reform factor, corruption becomes insignificant. They conclude that structural reform is more important than reducing the level of corruption in attracting FDI.

Wei (2000a: 1) examines the effects of taxation and corruption on FDI using bilateral FDI flow data from 12 source countries to 45 host countries. Using three different measures of corruption, he concluded that an increase in either the tax rate on multinational firms or the level of corruption in the host countries would reduce inward FDI. "An increase in the level of corruption from that of Singapore to that of Mexico would have the same negative effect on inward FDI as raising the tax rate by 50 percentage points." By again using survey data on countries' investment environments, Wei (2000b) also examines corruption's effects on the composition of capital flows

[2]In 1997, OECD countries signed an agreement governing the use of bribery to win foreign business.

using bilateral capital flow data from 14 source countries to 53 host countries. His findings suggest that there is indeed a negative relationship between corruption and FDI and that the reduction in FDI caused by corruption is greater than the negative impact of corruption on other types of capital inflows.[3]

Focusing on only developing countries, Akçay (2001) uses cross-sectional data from 52 developing countries with two different indices of corruption to estimate the effects of the level of corruption on FDI inflows. He fails to find evidence of a negative relationship between FDI and corruption. He concludes that the most significant determinants of FDI are market size, corporate tax rates, labor costs, and openness.

Smarzynska and Wei (2002) use a firm-level data set from transition economies to investigate the effects of corruption in terms of firms' decision not to enter a particular market, rather than in terms of reduced bilateral investment flows. Conditional on FDI taking place, their results show that FDI entry strategy in a corrupt host country is to enter into joint ventures with a domestic partner to save the transaction costs of dealing with local government officials rather than to establish a wholly owned subsidiary.

Habib and Zurawicki (2002) analyze the effects of corruption on bilateral FDI flows using a sample of seven source countries and 89 host countries. They hypothesize that the greater the absolute difference in the corruption level between the source and the host countries, the smaller the FDI inflows for the host country. They regressed bilateral FDI on a set of control variables including the absolute difference between the corruption levels in the source and the host countries. They find that foreign firms tend to avoid situations where corruption is visibly present because corruption is considered immoral and might be an important cause of inefficiency.

Using a single source country, Voyer and Beamish (2004) use cross-sectional regressions to investigate the effects of the level of corruption on Japanese FDI in 59 (developed and emerging) host countries. They find that Japanese FDI is negatively related to the level of corruption especially in emerging countries. Further, their results show that in emerging countries where a comprehensive legal

[3]Wei (2000b) finds that a corrupt host country tends to receive less FDI relative to bank loans and portfolio capital.

system is underdeveloped or does not exist to effectively reduce illegal activities, corruption serves to reduce Japanese FDI inflows.

All these studies, with the exception of Abed and Davoodi's (2000) study, use a cross-sectional methodology to test the relationship between corruption levels and FDI inflows and ignore the fact that corruption is a complex phenomenon. Corruption is correlated with many other characteristics of the host country such as the quality of institutions, lack of competition, and cultural values. Also, there may be time-invariant unobserved effects that vary across countries and are correlated with corruption. Obviously, failing to hold all these factors constant, the estimated effects may be biased in either direction. These studies also have ignored the fact that corruption is not necessarily an independent variable. In particular, the level of corruption may be affected by other variables in the host country such as the level of development, quality of institutions, and cultural values.

This article complements the literature on the effects of corruption on FDI location. It distinguishes itself from the existing literature by incorporating a panel data econometric model that controls for the unobserved country-specific effects that are correlated with the level of corruption. Thus, we control for the country-specific fixed effects while estimating the effects of corruption on FDI location by means of fixed effects (FE) model estimations.

The Model

Since the aim of this article is to empirically disentangle the role of the corruption level in the host country on the volume of FDI inflows, the investigation will start using a cross-sectional analysis as an initial step to confirm the findings of previous studies. Then a panel data analysis will be employed. Such an approach has distinct advantages. With panel data use, the sample size is much larger than would be the case if just pure time-series or cross-sectional data were employed, and so more degrees of freedom and more efficiency results in an increase in the reliability of the estimates of the regression coefficients (Baltagi 2005: 5). Thus, our benchmark FDI equation may be built up in the following linear form:

$$(1)\ \log(\mathrm{FDI}/\mathrm{POP})_{i,t} = \beta_0 + \beta_1 \mathrm{ICRG}_{i,t-1} + \beta_2 \mathrm{RISK}_{i,t-1} + \beta_3 \log(\mathrm{GDPPC})_{i,t-1} + \beta_4 \mathrm{GDPG}_{i,t-1} + \beta_5 \mathrm{OPEN}_{i,t-1} + \beta_6 \mathrm{INF}_{i,t-1} + \beta_7 \mathrm{SCH}_{i,t-1}$$

$$+ \beta_8 \text{POPG}_{i,t-1} + \beta_9 \text{UPOPG}_{i,t-1} + \beta_{10} \text{AGGLO}_{i,t-1} + \beta_{11} \text{LAW}_{i,t-1} + \beta_{12} \text{DEMOC}_{i,t-1} + \eta_i + \varepsilon_{i,t}.$$

Where i is the country subscript, t is the time subscript, βs are unknown parameters to be estimated, ε is the usual random disturbance term, and η is the unobserved country-specific effects. All explanatory variables are lagged one year in order to avoid simultaneity with the dependent variable and taking into account that decisions to invest abroad take time. Only the dependent variable and GDP per capita are in logarithm form. (See the Appendix for definitions of the variables and data sources.)

The main interest of this empirical exercise is the sign and the magnitude of β_1 (i.e., the marginal effect of corruption on the FDI inflows), while the effects of the control variables are of a secondary interest. The dependent variable is total FDI inflows a host country receives at time t divided by the host country's total population (i.e., FDI per capita).[4] The key explanatory variable is the corruption level in the host country as measured by the International Country Risk Guide (ICRG) corruption index. According to ICRG, "The corruption index measures the financial corruption in the form of demands for special payments and bribes connected with import and export license, exchange controls, tax assessments, police protection or loans."

The choice of the control variables is motivated by the related existing empirical studies and the availability of data. In particular, this article focuses on the host country-locational advantages of Dunning's (1988) "eclectic paradigm." Further, Chakrabarti (2001) examines the robustness of the independent variables most commonly employed in the literature on the determinants of FDI. He concludes that the only variable that passes the robustness test is the market size of the host country measured by GDP per capita. He then ranks the country's openness to trade as the most likely variable to be correlated with FDI, followed by wages, net exports, GDP growth rates, tax rates, tariffs, and exchange rates.

[4]The difference between total FDI inflows and net FDI flows should be clear. The former is the total FDI inflows a country has received in a given year, while the latter is defined by total FDI inflows minus total FDI outflows in a given year.

Thus, to control for the host country's market size and market potential, I use GDP per capita (GDPPC), the growth rate of GDP (GDPG), and the growth rate of population (POPG). The argument about the growth rate of population is straightforward. If a country's population is growing very fast, this may serve as a catalyst for FDI inflows. I expect that FDI inflows are positively associated with these factors. The degree of openness (OPEN) is measured by the sum of exports and imports as a percentage of GDP and its effect is expected to be positive. Economic stability is controlled by the inflation rate (INF) in the host countries and we would expect a negative relationship. I control for the quality of human capital by the host country's secondary school enrollment (% gross) (SCH) and the illiteracy rate (ILL). Stable social and political environment strongly affects FDI and so we control for political risk (RISK). Also, a high degree of urbanization will tend to encourage FDI inflows since it may also imply a high quality of infrastructure and concentrated consumers. I use the growth rate of urban population (UPOPG) as a proxy for urbanization. Foreign investors may be attracted to a host country that has large existing FDI stocks. It may be viewed as a signal for good investment environment. Thus, I use the existing FDI stocks as a percentage of GDP in the host country as a proxy for agglomeration effects (AGGLO). Finally, I control for the quality of institutions (LAW) and for democratic institutions (DEMOC). I expect that they will play a positive role in determining the location of FDI.[5]

The Data

This article employs panel data for 117 countries (see Table 1) over the period 1984–2004. All countries (developed and developing) for which data are available over this period are included in this study. I use FDI inflows measured in current U.S. dollars divided by the host country's total population as the dependent variable, and data come from UNCTAD. With respect to the control variables, data on GDP per capita (measured in current U.S. dollars), the growth rate of GDP, the degree of openness, the inflation rate, and

[5]It would have been desirable to control for other institutional variables such as the time required to start up a new business and the extent of regulations governing market entry, but panel data for such variables are not yet available.

TABLE 1
COUNTRY SAMPLE

Albania	Ecuador	Kenya	Philippines	Uruguay
Algeria	Egypt	Korea, Rep.	Poland	Venezuela
Angola	El Salvador	Kuwait	Portugal*	Vietnam
Argentina	Ethiopia	Lebanon	Romania	Zambia
Australia*	Finland*	Liberia	Russian Federation	Zimbabwe
Austria*	France*	Libya	Saudi Arabia	
Bahamas	Gabon	Madagascar	Senegal	
Bahrain	Gambia	Malawi	Sierra Leone	
Bangladesh	Germany*	Malaysia	Singapore	
Belgium*	Ghana	Mali	Slovak Republic	
Bolivia	Greece*	Malta	South Africa	
Botswana	Guatemala	Mexico	Spain*	
Brazil	Guinea	Mongolia	Sri Lanka	
Bulgaria	Guinea-Bissau	Morocco	Sudan	
Burkina Faso	Guyana	Mozambique	Suriname	
Cameroon	Haiti	Namibia	Sweden*	
Canada*	Honduras	Netherlands*	Switzerland*	

continued

TABLE 1 *(continued)*
Country Sample

Chile	Hungary	New Zealand*	Syria
China	Iceland*	Nicaragua	Tanzania
Colombia	India	Niger	Thailand
Congo, Rep.	Indonesia	Nigeria	Togo
Congo, Dem. Rep.	Iran	Norway*	Trinidad and Tobago
Costa Rica	Ireland*	Oman	Tunisia
Cote d'Ivoire	Israel	Pakistan	Turkey
Cyprus	Italy*	Panama	Uganda
Czech Republic	Jamaica	Papua New Guinea	UAE
Denmark*	Japan*	Paraguay	UK*
Dominican Republic	Jordan	Peru	USA*

* High-Income OECD countries.

the illiteracy rate come from the World Bank's *World Development Indicators* (WDI 2006). Data on secondary school enrollment come from Easterly (2001) and WDI (2006). Corruption (ICRG) is an index scaled from 6 (highly corrupt) to 0 (highly clean).[6] To capture the institutional quality, I use a law and order index scaled from 0 (very low) to 6 (very high). Data on those indices come from *International Country Risk Guide*. To capture the effects of political risk (RISK), I use an index ranking countries based on a scale of 1 (very safe) to 5 (very risky), and data come from Gibney and Dalton (1996). Democracy index (DEMOC) scales countries from 100 (full democracy) to 0 (no democracy), and data come from t*he Quality of Government Institute*. A full description of the data and their sources is in the Appendix. Table 2 reports the descriptive statistics and Table 3 reports the correlation matrix for the variables used in this article.

Empirical Results

I start with the cross-sectional analysis, as an initial step to confirm previous studies, using averages for the entire period 1984–2004. Also, to achieve worthwhile results about the impact of corruption, I will first sketch out the model without specifying whether the host countries are developed or developing. Then I will exclude the high income-OECD countries from the sample.[7]

The OLS cross-sectional regression results are presented in Table 4. Six different regressions are run. Model (1) employs our full sample (developed and developing countries). Model (2) reports the results after excluding the outlier observations. Model (3) reports the results after we add the quality of institution and democracy variables into Model (2). Model (4) estimates the model for a sample containing only developing countries. Model (5) reports the results after adding the quality of institution and democracy variables into Model

[6]The ICRG index is used rather than other corruption measures because of its widespread country coverage. To avoid any confusion in the interpretation, I rescaled the measure of corruption by 6 minus the ICRG index—therefore zero means highly clean, while 6 means highly corrupt.

[7]The high income-OECD countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, and United States.

TABLE 2
Descriptive Statistics

Sample: 117 host countries (1984–2004)

Variables	Obs	Mean	Std. Dev.	Min	Max
FDI	2,087	3,706.38	14,758.48	0	31,4007
ICRG	2,087	2.76	1.36	0	6
RISK	2,087	2.43	1.16	1	5
GDPPC	2,087	6,481.52	8,837.19	44.64	39,198.17
GDPG	2,087	3.38	5.24	– 51.03	106.27
OPEN	2,087	72.65	46.24	10.73	427.80
INF	2,087	51.02	406.93	– 29.17	12,338.60
SCH	2,087	63.03	33.26	4.50	178.30
ILL	2,087	0.31	0.46	0	91.40
POPG	2,087	1.74	1.20	–3.07	9.84
AGGLO	2,087	24.43	70.56	–167.60	1,829.40
LAW	2,087	3.69	1.53	0	6
DEMOC	2,087	16.30	13.67	0	49
BURE	2,087	6.65	3.57	0	12

TABLE 3
Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
log(FDIPC)	1														
ICRG	–0.46	1													
RISK	–0.50	0.53	1												
Log(GDPPC)	0.72	–0.60	–0.58	1											
GDPG	0.04	0.01	0.00	–0.03	1										
OPEN	0.39	–0.08	–0.27	0.20	0.08	1									
SCH	0.68	–0.55	–0.50	0.84	–0.04	0.20	1								
ILL	–0.63	0.46	0.40	–0.74	0.02	–0.22	–0.80	1							
INF	–0.09	0.03	0.09	–0.05	–0.08	–0.06	–0.06	0.01	1						
POPG	–0.38	0.36	0.29	–0.43	0.09	0.03	–0.59	0.59	0.02	1					
UPOPG	0.63	–0.43	–0.40	0.84	–0.05	0.23	0.74	–0.68	0.01	–0.31	1				
AGGLO	0.10	0.08	0.06	–0.08	0.06	0.17	–0.02	0.03	0.03	0.03	0.00	1			
DEMOC	0.56	–0.58	–0.52	0.68	–0.07	0.03	0.71	–0.67	–0.01	–0.64	0.52	–0.05	1		
LAW	0.59	–0.66	–0.58	0.65	0.03	0.18	0.61	–0.51	–0.11	–0.40	0.47	–0.03	0.52	1	
BURE	0.59	–0.70	–0.52	0.73	0.01	0.16	0.68	–0.55	–0.09	–0.40	0.52	–0.07	0.61	0.69	1

TABLE 4
Cross-Sectional Regressions: FDI Inflows and Corruption

	Ordinary Least Squares					
	Dependent Variable: log of FDI per capita					
	Full Sample			Developing Countries		
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	–9.9*	–10.4*	–10.7*	–10.7*	–11.0*	–11.7*
	(–9.61)	(–16.18)	(–15.2)	(–14.6)	(–13.3)	(–17.8)
ICRG	–0.22**	–0.21*	–0.21**	–0.21**	–0.20***	–0.19***
	(–2.40)	(–3.07)	(–2.43)	(–2.14)	(–1.93)	(–1.75)
RISK	–0.24**	–0.10	–0.07	–0.11	–0.08	–0.10
	(–2.07)	(–1.19)	(–0.77)	(–1.25)	(–0.81)	(–1.06)
Log(GDPPC)	0.53*	0.60*	0.57*	0.64*	0.62*	0.67*
	(4.09)	(7.68)	(7.13)	(5.42)	(5.46)	(5.78)
GDPG	0.11**	0.06***	0.07***	0.07***	0.08***	0.08***
	(2.40)	(1.95)	(1.77)	(1.90)	(1.85)	(1.87)
OPEN	0.01*	0.003	0.003	0.002	0.001	0.002
	(4.56)	(1.50)	(1.33)	(1.22)	(0.83)	(0.93)

INF	0.001**	0.0003	0.0003***	0.0003***	0.0003***	0.0003**
	(2.39)	(1.61)	(1.65)	(1.68)	(1.79)	(2.10)
SCH						0.003
`						(0.75)
ILL	–0.01**	–0.01**	–0.01**	–0.01**	–0.008***	
	(–2.44)	(–2.43)	(–2.10)	(–2.28)	(–1.85)	
POPG	–0.14**	–0.15**	–0.17**	–0.16**	–0.16**	–0.18**
	(–2.05)	(–2.45)	(–2.21)	(–2.32)	(–1.98)	(–1.99)
UPOPG	0.004	0.01**	0.01*	0.008	0.01	0.007
	(0.63)	(2.06)	(2.60)	(1.28)	(1.58)	(1.13)
AGGLO	0.01*	0.02*	0.02*	0.02*	0.03*	0.02*
	(6.02)	(4.54)	(5.10)	(3.40)	(5.16)	(5.37)
LAW			0.02		0.02	0.01
			(0.59)		(0.61)	(0.41)
DEMOC			0.0001		0.005	0.01
			(0.01)		(0.39)	(0.64)
No. of Obs	111	106	105	86	85	88
R2	0.86	0.93	0.93	0.90	0.90	0.89
Mean VIF	2.93	2.93	3.47	2.79	2.75	2.96

Notes: Developing countries consist of all countries except the high-income OECD countries. Models (2)–(6) are estimated after excluding outliers: Iran, Japan, Kuwait, Liberia, and Libya. Robust *t*-statistics are in parentheses. Multicollinearity has been tested by the creation of variance inflation factors (VIF). *, **, and *** indicate statistical significance at 1 percent, 5 percent, and 10 percent levels, respectively.

(4). Model (6) uses a different measure of the quality of human capital (secondary school enrollment).

As can be seen from all regression results, the coefficient of corruption is negative and significant at the 5 percent level, supporting the findings of Wei (2000a, 2000b), Habib and Zurawicki (2002), and Voyer and Beamish (2004), who find a statistically significant negative relation between the corruption level in the host country and the amount of FDI it receives. The results reported under column (5) show that a one-point increase in the corruption level causes a reduction in per capita FDI inflows by about 20 percent. Thus, ceteris paribus, countries with high levels of corruption over the period 1984–2004 have received less FDI per capita.[8]

Moreover, with the exception of the coefficients produced for the inflation and population growth rate variables, which have the opposite signs,[9] all the control variables have the expected sign and are significant at the 5 percent level. As such, they are consistent with the literature of the determinants of FDI location.

Indeed, the cross-sectional regressions show that the levels of corruption have a negative effect on FDI inflows, and this result is robust to the including of most variables used in the determinants of FDI location. Although the cross-sectional analysis is useful to study a long-run relationship, we cannot control for unobserved country-specific effects which may be correlated with the included independent variables in the model. Therefore, our results, as well as previous existing studies on the influence of the level of corruption on FDI inflows, which employ cross-sectional regressions, may well reflect other unmeasured influences that vary across countries but not over time.

Our panel data regression results are presented in Table 5. Six different regressions are run. Model (1) employs our full sample (developed and developing countries). Model (2) reports the results after

[8]Since our dependent variable (FDI per capita) is logged while corruption variable is not, a one-unit changes in the corruption index leads to a proportionate change in per capita FDI inflows.

[9]One reason for this result may be due to the fact that I employ the average data for the period 1984–2004. For instance, most Latin American countries had high inflation rates during the 1990s but very low rates since 1998. Taking the average of this variable would lead to high inflation rates for those countries. However, Latin America has had an increasing growth rate of FDI inflows since the 1990s, which leads to the wrong sign of this factor. Plausibly, the same argument may be applied to all variables in our regressions and so we cannot heavily rely on a cross-sectional analysis.

adding the quality of institution and democracy variables into Model (1). Model (3) reports the results after adding time-specific effects into Model (2). Model (4) reports the results after excluding the high-income OECD countries. Model (5) adds the quality of institution and democracy variables into Model (4). Finally, Model (6) estimates Model (5) after adding time-specific effects. The overall models are statistically significant and explain about 30 percent of the variance. Further evaluation of the models is undertaken by applying the Ramsey RESET test.[10] The results show that we could not reject the null hypothesis of the test suggesting no evidence of misspecification of functional forms except in Models (4) and (6). The corresponding *p*-values of the test are reported at the bottom of Table 2.

The Effects of Corruption

As can be seen from Models (1) and (4) the coefficient of corruption is negative although insignificant in Model (1), but highly significant when we exclude the high-income OECD countries from our sample. Again, this result confirms the previous work, which finds a negative association between the corruption level in the host country and FDI inflows. That is, ceteris paribus, a one-point increase in the corruption index causes a reduction in per capita FDI inflows by 11 percent, which is lower than the cross-sectional regression effect. Apparently, the correction for unobserved country-specific effects has a substantial impact on the estimates. Based on the results reported under column (4), the estimated coefficient of corruption declined from 0.21 in the OLS regression to 0.11 in the FE regression. However, once we control for the quality of institutions in the host country, the negative effect disappears. Surprisingly, the effect becomes positive although insignificant in Models (2) and (5). One explanation to this result is that the negative relationship between the corruption level and FDI inflows can be attributed to the failure to control for the quality of institutions in previous studies. However, the results should not be interpreted as evidence that the corruption level in the host country does not reduce the amount of FDI it

[10]The Ramsey regression equation specification error test (RESET) is a general specification test to test whether nonlinear combinations of the estimated values help explain the dependent variable. The idea behind the test is that, if nonlinear combinations of the explanatory variables have any power in explaining the dependent variable, then the model is misspecified (Wooldridge 2002: 281–83).

TABLE 5
Panel Data Regressions: FDI Inflows and Corruption

	Fixed Effects Models					
	Dependent Variable: Log of FDI per capita: 1984–2004					
	Full Sample			Developing Countries		
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)
Constant	–17.2*	–13.8*	– 2.80	–14.2*	– 9.80*	– 2.20
	(–10.9)	(– 8.64)	(–1.45)	(– 8.47)	(– 5.91)	(–1.19)
ICRG	– 0.05	0.07	0.001	– 0.11*	0.02	– 0.02
	(–1.17)	(1.50)	(0.02)	(– 2.62)	(0.43)	(– 0.40)
RISK	– 0.17*	– 0.13**	– 0.22*	–0.18*	– 0.15*	– 0.21*
	(– 2.86)	(– 2.46)	(– 4.11)	(– 3.02)	(– 2.56)	(– 3.75)
Log(GDPPC)	2.10*	1.60*	1.10*	1.80*	1.20*	0.97*
	(8.57)	(6.44)	(4.35)	(7.00)	(4.61)	(3.83)
GDPG	0.02*	0.02*	0.01**	0.02*	0.01**	0.01**
	(2.99)	(2.66)	(2.24)	(2.69)	(2.48)	(2.09)
OPEN	0.01*	0.01*	0.01*	0.01*	0.01*	0.01*
	(5.90)	(6.00)	(4.84)	(4.71)	(5.22)	(4.34)

INF	– 0.0002*	– 0.0002*	– 0.0001*	– 0.0002*	– 0.0002*	– 0.0002*
	(– 3.40)	(– 3.31)	(– 3.32)	(– 3.23)	(– 3.25)	(– 3.16)
SCH	0.02*	0.01*	0.003	0.02*	0.02*	0.01***
	(4.94)	(4.83)	(1.04)	(4.76)	(4.27)	(1.88)
POPG	– 0.22*	– 0.18**	– 0.13***	– 0.23*	– 0.19**	– 0.14***
	(– 2.72)	(– 2.32)	(–1.67)	(– 2.76)	(–2.39)	(–1.69)
UPOPG	0.06*	0.03**	– 0.05*	0.06*	0.02	– 0.05*
	(4.29)	(2.12)	(– 3.10)	(3.86)	(1.47)	(– 2.85)
AGGLO	0.003*	0.002*	0.001	0.003*	0.002**	0.001
	(3.18)	(2.67)	(1.00)	(2.86)	(2.15)	(1.01)
LAW		0.26*	0.14*		0.29*	0.05*
		(6.87)	(3.58)		(7.06)	(5.22)
DEMOC		0.05*	0.04*		0.062*	0.17*
		(6.23)	(4.52)		(7.01)	(3.84)
Time effects	no	no	yes	no	no	yes
No. of Groups	117	117	117	95	95	95
No. of Obs	2,014	2,014	2,014	1,618	1,618	1,618
R2 (Within)	0.26	0.30	0.35	0.25	0.31	0.34
R2 (Between)	0.75	0.77	0.67	0.66	0.70	0.55
RESET test (p-value)	0.19	0.38	0.20	0.03	0.13	0.03

Notes: All the independent variables lagged one period. Robust t-statistics are in parentheses. *, ** and *** indicate statistical significance at 1 percent, 5 percent, and 10 percent levels, respectively.

receives. Rather, one should view the results as an indication of the importance of the quality of institutions. In other words, as we discussed above, corruption is an illegal activity and so the willingness to engage in corrupt activities depends on the penalty imposed and on the probability of being caught (Becker 1968). Therefore, if a country has good-quality institutions, it may still be able to attract more FDI inflows despite its level of corruption.

The Effects of the Control Variables

All the control variables have the expected effects and are significant at the 1 percent level. The population growth rate still has an opposite sign though. The results are consistent with the existing literature. The host country's market size measured by per capita GDP is positive and highly significant at the 1 percent level. The growth rate of GDP, which is a proxy for market potential, is also positively and statistically significant at the 1 percent level, which implies that foreign investors are forward-looking. This finding is consistent with the hypothesis that market-seeking FDI is attracted to a country with large market size and its economy is growing over time. On the other hand, the growth rate of population is found to have a negative effect contrary to the hypothesis set forth. The effect of the degree of openness is also positive and statistically significant at the 1 percent level. The quality of human capital is also positive and significant at the 1 percent level, so FDI is attracted to a country with high levels of skilled labor.[11]

The results show strong support for the existence of the expected negative relationship between FDI inflows and political risk. Also, macroeconomic instability measured by the inflation rate negatively affects FDI inflows. Both variables are statistically significant at the 1 percent level in all models. The degree of urbanization measured by the urban population growth appears to positively affect the investment decisions of FDI location although the effect sometimes is not significant. Moreover, agglomeration effects exhibit a high degree of statistical significance and have positive impacts on FDI inflows, implying that past FDI in the host country attracts new FDI inflows. Finally, the coefficients of the institutional quality and dem-

[11]Also, in unreported regressions, the illiteracy rate was used as another proxy for the quality of human capital. The coefficient was negative and statistically significant at the 1 percent level. The full results are available from the author upon request.

ocratic institutions are positive and statistically significant at the 1 percent level, which implies that the host country's institutional quality as well as the type of its institutions highly influences investment decisions. For instance, a one-point improvement in the law and order index leads to an increase of about 29 percent in the per capita FDI inflows a country receives, while a democratic country receives about 10 percent more per capita FDI inflows than an autocratic country.

Sensitivity Analysis

We have seen that corruption may have positive effects on FDI if a host country has a rigid bureaucracy and corruption greases the wheels of government. However, the willingness to engage in corrupt activities depends on the penalty imposed and on the probability of being caught. If a country has good institutions, the probability of getting caught is very high and government officials may find it difficult to engage in corrupt activities.

Thus, our robustness hypothesis is concerned with the interaction terms that occur between bureaucratic quality and corruption (ICRG*BURE), institutional quality and corruption (ICRG*LAW), and democratic institutions and corruption (ICRG*DEMOC). Essentially, we are just testing whether the effects of corruption are significantly different in countries with a high level of bureaucratic quality, institutional quality, and democratic institutions. We would expect these interaction terms to have negative effects on FDI location if corruption deters foreign investors. For instance, if the coefficient of (ICRG*BURE) is negative and significant, then it is interpreted that corruption negatively affects FDI inflows via the interaction with the quality of bureaucracy. The results of those regressions are reported in Table 6. Column (1) shows that there is no evidence that the effect of corruption on FDI inflows depends on the quality of bureaucracy. The interaction term (ICRG*BURE) is negatively related to FDI inflows, but the effect is insignificant while the effect of corruption is positive and significant at the 10 percent level.

Also, column (2) shows that the interaction term (ICRG*LAW) is positively related to FDI inflows, but its effect as well as the effect of corruption is insignificant. Finally, column (3) shows that the interaction term (ICRG*DEMOC) is negatively related to FDI inflows, but its effect, as well as the effect of corruption, is insignificant.

TABLE 6
Sensitivity Analysis: FDI Inflows and Corruption

	Fixed Effects Models		
	Dependent Variable: log of FDI per capita: Developing Countries: 1984–2004		
Independent Variables	(1)	(2)	(3)
ICRG	0.16***	–0.02	0.04
	(1.70)	(–0.17)	(0.65)
RISK	–0.14**	–0.15*	–0.14*
	(–2.42)	(–2.58)	(–2.54)
LAW	0.25*	0.25*	0.29*
	(6.17)	(2.92)	(7.05)
DEMOC	0.06*	0.06*	0.07*
	(6.95)	(7.04)	(4.56)
BURE	0.41*		
	(2.62)		
(ICRG* BURE)	–0.04		
	(–1.08)		
(ICRG*LAW)		0.01	
		(0.48)	
(ICRG*DEMOC)			–0.001
			(–0.56)
No. of Groups	95	95	95
No. of Obs	1,618	1,618	1,618
R2 (Within)	0.32	0.31	0.31
R2 (Between)	0.69	0.70	0.71

Notes: Robust *t*-statistics are in parentheses. All models are estimated with a constant and the full control variables. *, **, and *** indicate statistical significance at 1 percent, 5 percent, and 10 percent levels, respectively.

Conclusion

The effects of corruption on economic activities have received attention in recent literature. The level of corruption in the host country has been introduced as one factor among the determinants of FDI location. Some empirical studies provide evidence of a nega-

tive link between corruption and FDI inflows, while others fail to find such a relationship. Most existing studies are largely based on a cross-sectional analysis that cannot account for unobserved country-specific effects with which the corruption level is correlated. In addition, the simultaneity between corruption and FDI is ignored.

This article has sought to answer the following question: Controlling for other determinants of FDI location, does a corrupt host country receive less or more FDI inflows? To test this hypothesis, I employ data for 117 countries over the period 1984–2004 and introduce two different econometric methods, different panel data sets, and a much wider set of control variables.

The empirical evidence presented in this article can be summarized as follows: The cross-sectional regressions are consistent with the argument that corruption deters foreign investors. However, as we move to panel data methods, the negative impacts of corruption disappear once we control for the host country's institutional quality, suggesting that foreign investors value the quality of institutions more than the level of corruption in the location selection. However, the results should not be interpreted as evidence that the corruption levels in the host country do not reduce the amount of FDI it receives. Rather, the results should be seen as an indication of the importance of the quality of institutions.

This study has some limitations. First, FDI inflows can be negative, so the logarithm of FDI may be problematic because the negative observations would be automatically dropped. Excluding those observations from our sample may bias our results. Another limitation of this study is that it uses aggregated data on FDI inflows. Foreign investors operating within the same host country may have different degrees of sensitivity to changes in the host country's corruption level, so one should examine the effects of corruption on FDI inflows based on the nature of different sectors and industries. Development of sectoral and industrial data would prevent potential biases in evaluating the effects of corruption on FDI inflows. I believe the potential for future research along these lines is warranted.

Appendix: Definitions of Variables and Their Sources

Foreign Direct Investment (FDI), (in millions of current US$): FDI is defined as investment that is made to acquire a lasting man-

agement interest (usually 10 percent of voting stock) in an enterprise operating in a country other than that of the investor (defined according to residency), the investor's purpose being an effective voice in the management of the enterprise. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments (UNCTAD 2006).

GDPPC: Gross Domestic Product (in current US$) divided by midyear population (WDI 2006).

GDPG: Growth rate of GDP (annual %) (WDI 2006).

INF: Inflation, GDP deflator (annual %) (WDI 2006).

POPG: Growth rate of Urban population (Annual %) (WDI 2006).

UPOPG: Growth rate of urban population: urban population is the midyear population of areas defined as urban in each country and reported to the United Nations (WDI 2006).

AGGLO: FDI stock and a percentage of GDP. FDI stock is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises. (UNCTAD 2006).

SCH: School Enrollment, Secondary (% gross). Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Secondary education completes the provision of basic education that began at the primary level, and aims at laying the foundations for lifelong learning and human development, by offering more subject- or skill-oriented instruction using more specialized teachers. Ratios above 100 percent in some cases suggest that some students are attending this school at ages outside the student ranges. For the years from 1982 to 1998, data are obtained from World Bank's Global Development Network Growth Database provided by Easterly (2001). And from 1999 to 2004, data are obtained from (WDI 2006).

ILL: Illiteracy rate of persons aged 15 years and over. Adult literacy rate is the percentage of people ages 15 and above who can, with understanding, read and write a short, simple statement on their everyday life (International Labour Organization).

OPEN: Trade (% of GDP): Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product (WDI 2006).

ICRG: International Country Risk Guide corruption index: The data are yearly, and cover the period 1984–2004. The index indicates the opinion of analysts on each country regarding the extent to which "high government officials are likely to demand special payments" and "illegal payments are generally expected throughout lower levels of government" in the form of "bribes connected with import and export licenses, exchange controls, tax assessment, policy protection or loans" (Knack and Keefer 1995: 225). Countries are scored from 0 (very corrupt) to 6 (very clean). I transformed the data to make the results easier to follow by subtracting the index from 6, so that high values of the index mean a higher level of corruption).

LAW: An index from 0 (very low) to 6 (very high), measuring the strength of Law and Order. The Law subcomponent is an assessment of the strength and impartiality of the legal system, while the Order subcomponent is an assessment of popular observance of the law. Thus, a country can enjoy a high rating (3) in terms of its judicial system, but a low rating (1) if it suffers from a very high crime rate of if the law is routinely ignored without effective sanction—for example, widespread illegal strikes (Knack and Keefer 1995: 225).

RISK: Political Terror Scale: 1 (very safe) and 5 (very risky). Countries are coded on a scale of 1 to 5 according to their level of terror the previous year according to the descriptions of these countries provided in the Amnesty International and U.S. State Department Country Report. These levels are:

- Level 1: Countries under a secure rule of law, people are not imprisoned for their views, and torture is rare or exceptional. Political murders are extremely rare.
- Level 2: There is a limited amount of imprisonment for nonviolent political activity. However, few persons are affected, torture and beatings are exceptional. Political murder is rare.
- Level 3: There is extensive political imprisonment, or a recent history of such imprisonment. Execution or other political murders and brutality may be common. Unlimited detention, with or without a trial, for political views is accepted.
- Level 4: The practices of level 3 are expanded to larger numbers. Murders, disappearances, and torture are a common part of life. In spite of its generality, on this level terror affects those who interest themselves in politics or ideas.

- Level 5: The terrors of level 4 have been expanded to the whole population. The leaders of these societies place no limits on the means or thoroughness with which they pursue personal or ideological goals.

DEMOC: Index of Democratization: the index combines two basic dimensions of democracy—competition and participation—measured as the percentage of votes not cast for the largest party (competition) times the percentage of the population who actually voted in the election (participation). This product is divided by 100 to form an index that could vary from 0 (no democracy) to 100 (full democracy). Competition is calculated by subtracting the percentage of the votes won by the largest party from 100. Participation is defined as the percentage of the total population who actually voted in the election.

References

Abed, G., and Davoodi, H. (2000) "Corruption, Structural Reforms and Economic Performance in the Transition Economies." IMF Working Paper No. 132. Washington: International Monetary Fund.

Akçay, S. (2001) "Is Corruption an Obstacle for Foreign Investors in Developing Countries? A Cross-Country Evidence." *Yapi Kredi Economic Review* 12 (2): 27–34.

Baltagi, B. (2005) *Econometric Analysis of Panel Data.* 3rd ed. Hoboken, N.J.: John Wiley.

Bardhan, P. (1997) "Corruption and Development: A Review of Issues." *Journal of Economic Literature* 25: 1320–46.

Becker, G. (1968) "Crime and Punishment: An Economic Approach." *Journal of Political Economy* 76 (2): 169–217.

Chakrabarti, A. (2001) "The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-Country Regression." *Kyklos* 54 (1): 89–114.

Dunning, J. (1988) "The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions." *Journal of International Business Studies* 19: 1–29.

Easterly, W. (2001) "The Lost Decades: Developing Countries' Stagnation in Spite of Policy Reform 1980–1998 Dataset." See Global Development Network Growth Database, World Bank (www.worldbank.org/research/growth).

Gibney, M., and Dalton, M. (1996) "The Political Terror Scale." In S. S. Nagel and D. L. Cingranelli (eds.) *Human Rights and Developing Countries*. Greenwich, Conn.: JAI Press.

Gupta, S.; Davoodi, H.; and Tiongson, E. (2000) "Corruption and the Provision of Health Care and Education Services." IMF Working Paper No. 116. Washington: International Monetary Fund.

Gupta, S.; Davoodi, H.; and Alonso-Terme, R. (1998) "Does Corruption Affect Income Inequality and Poverty?" IMF Working Paper No. 76. Washington: International Monetary Fund.

Habib, M., and Zurawicki, L. (2002) "Corruption and Foreign Direct Investment." *Journal of International Business Studies* 33 (2): 291–307.

Hines, J. (1995) "Forbidden Payment: Foreign Bribery and American Business after 1977." NBER Working Paper No. 5266.

Houston, D. (2007) "Can Corruption Ever Improve an Economy?" *Cato Journal* 27 (3): 325–42.

IGRG (2006) I*nternational Country Risk Guide: Political Risk.* PRS Group. Available at www.icrgonline.com/default.aspx.

Kaufmann, D., and Wei, S. (1999) "Does 'Grease Money' Speed Up the Wheels of Commerce?" NBER Working Paper No. 7093.

Knack, S., and Keefer, P. (1995) "Institutions and Economic Performance: Cross–Country Tests Using Alternative Institutional Measures." *Economics and Politics* 7: 207–27.

Li, H.: Xu, L. C.; and Zou, H. F. (2000) "Corruption, Income Distribution, and Growth." *Economics and Politics* 12 (2): 155–82.

Macrae, J. (1982) "Underdevelopment and the Economics of Corruption: A Game Theory Approach." *World Development* 10 (8): 677–87.

Mauro, P. (1995) "Corruption and Growth." *Quarterly Journal of Economics* 110 (3): 681–712.

Smarzynska, B., and Wei, S. (2002) "Corruption and the Composition of Foreign Direct Investment: Firm-level Evidence." NBER Working Paper No. 7969.

Swaleheen, M., and Stansel, D. (2007) "Economic Freedom, Corruption, and Economic Growth." *Cato Journal* 27 (3): 343–58.

Tanzi, V., and Davoodi, H. (1997) "Corruption, Public Investment and Growth." IMF Working Paper No. 139. Washington: International Monetary Fund.

Teorell, Jan; Holmberg, S.; and Rothstein, B. (2006) The Quality of Government Dataset, version 15 (November). Göteborg University: The Quality of Government Institute. Available at www.qog.pol.gu.se.

UNCTAD (2006) *World Investment Report*. Geneva, Switzerland: United Nations Conference on Trade and Development. Available at www.unctad.org/sections/dite_dir/docs/wir2006_inflows_en.xls.

Voyer, P., and Beamish, P. (2004) "The Effect of Corruption on Japanese Foreign Direct Investment." *Journal of Business Ethics* 50: 211–24.

WDI (2006) World Bank, *World Development Indicators* 2006. Washington: World Bank.

Wei, S. (2000a) "How Taxing Is Corruption on International Investors." *Review of Economics and Statistics 82: 1–11.*

_____ (2000b) "Local Corruption and Global Capital Flows." *Brookings Papers on Economic Activity* 2: 303–46.

Wheeler, D., and Mody, A. (1992) "International Investment Location Decisions: The Case of U.S. Firms." *Journal of International Economics* 33: 57–76.

Wooldridge, J. (2002) *Introductory Econometrics: A Modern Approach.* 2nd ed. New York: South-Western.