Corruption and Foreign Direct Investment in Latin America: A Panel Gravity Model Approach

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Abstract

This paper employs a panel data gravity model to assess the impact of corruption on foreign direct investment in selected Latin American countries. Our results suggest that high levels of corruption are associated with high levels of FDI.

Keywords: corruption, governance, FDI, Latin America, panel gravity model

1. Introduction

There is increasing interest and growing literature on the institutional determinants of foreign direct investment (FDI) such as governance and economic freedom. Dunning (2002) suggested that multinational companies have gradually become more susceptible to the institutional factors as their motives have shifted from market and resource seeking to efficiency seeking. An OECD (2002) report went as far as arguing that no special incentives were needed to attract FDI as long as good governance conditions existed. In this context, corruption has attracted significantly higher levels of interest compared to the other governance indicators.

The literature on the determinants of FDI generally indicates that multinational companies are concerned about corruption. In this literature, there are two contrasting approaches, which are metaphorically named the "sand the wheels" view and the "grease the wheels" view. The first approach suggests that corruption deters FDI as it is an indication of a malfunctioning administration that increases costs for multinational companies. The "grease the wheels" view, however, argues that corruption can attract more FDI when there are distortions caused by ill-functioning institutions (Kaufmann & Wei, 1999, Meon & Sekkat, 2005). In this view when corruption and low governance quality coincide, corruption can compensate poor governance by accelerating procedures in a lethargic management, by overcoming tiresome bureaucratic regulations and by incentivizing poorly paid civil servants. Corruption, therefore, can attract more FDI by compensating poor governance.

There is no consensus, therefore, over the impact of corruption on FDI. While the majority of empirical literature supports the "sand the wheels" view, a number of recent articles provide support for the "grease the wheels" view (Aidt, 2003; Mironov, 2005). The recent empirical work by Bellos & Subasat (2011) indicates that corruption is not an impediment; in fact a source of attraction for multinational companies in selected transition countries. Our article aims to verify these interesting results, which contradict most of the relevant literature, in the context of Latin America. This is a meaningful exercise for a number of reasons. First, given that the results of Bellos & Subasat (2011) refute most of the relevant literature, verifying these findings in the context of other regions such as Latin America is essential. Indeed, there are reasons to believe that the positive correlation between corruption and FDI in transition countries may be due to their transition specific problems that cannot be generalised (Cuervo-Cazurra, 2008). An obvious way to assess this claim is to estimate similar regressions for the non-transition countries. Our results confirm that corruption enhances FDI not only in the transition countries but also in Latin America. Second, the literature on the link between corruption and FDI in the context of Latin America is very limited and no one has ever tested this link by using a panel data gravity model. While Biglaiser & Derouen (2006) and Biglaiser & Staats (2011) found no meaningful link between corruption and FDI in Latin America, our empirical results confirm that a positive and statistically significant relationship between corruption and FDI exists. Finally, the employment of corruption and other control variables in target and source

countries to take both push and pull factors into account has not been done before in this literature. For example, the low level of corruption in target countries may be a source of attraction for the MNCs but high level of corruption in the source countries may be a source of repulsion.

2. The Model

We adopt a similar but slightly more advanced model than Bellos & Subasat (2011) as our purpose is to verify their results in the context of Latin America. We employ corruption variables not only for target but also for source countries to examine whether corruption in the source countries is a source of repulsion. As far as we are concerned this has not been done in the literature.

Gravity models are often used to study FDI flows from source to target economies. The model aims to measure the "natural" pattern of bilateral FDI potential of the source and target countries by using two main components: the relative market sizes of the two economies and the geographic distance between their main economic centers. Given the core gravity variables, other variables can be added into the model and their relative impact can be assessed. Gravity modeling has been successfully tested for its usefulness in explaining bilateral trade and FDI flows.

We employ a panel data analysis, which has a number of well-recognized advantages. Compared with cross-sectional and time-series studies, panel data involves a much larger degree of freedom which increases the accuracy of regression estimates. It can also deal with omitted variable bias and heterogeneity problems that cross-sectional studies often suffer from. This is important because there may be several country-specific factors that cannot be directly built into the econometric models. Finally, panel data analysis has better capacity to capture complex social behaviour than cross-section and time-series data.

The model takes the following form:

$$FDI_{STt} = \beta_0 + \beta_1 \, GDP_{St} + \beta_2 \, GDP_{Tt} + \beta_3 \, DISTANCE_{ST} + \beta_4 \, COR_{T,St} + \beta_5 \, CONT_{T,St}$$

Where

FDI_{STt} is the bilateral FDI stock from the source to target country in current USD (UNCTAD). We use FDI stock because stocks are less volatile than flows. GDP_{St} and GDP_{Tt} are the GDPs of the source and target countries in current USD (World Bank). $DISTANCE_{ST}$ is the geographic distance between the source and target country which is a proxy for transportation and information costs (CEPII).

$COR_{T,St}$ is the corruption level in target and source countries. We employ four alternative measures of corruption in order to test the consistency of our results. COR-1 is taken from the PRS Group (2009). COR-2 is taken from the Annual Transparency International Databases. COR-3 is taken from Kane, Holmes & O'Grady (2007). COR-4 is the average of the corruption variables (Note 1). Corruption variables are scaled from 0 to 6, 0 to 10, 0 to 100 and 0 to 100 respectively. High values signify low corruption levels. If high corruption in target (source) countries deters (encourages) FDI, a positive (negative) sign on the coefficients would be expected. Note that all the corruption variables are subjective measures, which is a well-recognized concern (Note 2). Missing values is another important concern, particularly for the corruption variables. Working with three alternative corruption measures and employing panel data analysis protects us from this problem to a considerable extent. Nevertheless the results should be interpreted with caution.

$CONT_{T,St}$ refers to the control variables that are added to reduce the risk of excluded variables bias which are selected from a larger list of relevant variables. Because most of the variables were either highly collinear with the corruption variables or statistically insignificant we excluded them from the regressions. "Common language" dummy indicates the existence of a common language between the source and target country. The "land-lock" dummy is a proxy for high transportation costs. "Oil" measures the production of crude oil, natural gas and other liquids in thousands of barrels (US Energy Information Administration). "Ethnic tensions" indicates the degree of tension within a country attributable to racial, nationality, or language divisions (PRS Group). "GDP growth" is lagged growth of GDP and measures economic performance (World Bank). "Inflation" measures macroeconomic instability (World Bank). "Common-religion" measures cultural similarity. We use these variables for both target and source countries in order to take pull and puss factors into account.

3. Panel Data Analysis

The data cover a period of 24 years (1985-2008). The sample includes 24 target (Costa Rica, El Salvador, Guatemala, Argentina, Bahamas, Bolivia, Brazil, Chile, Colombia, Dominican Republic, Ecuador, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad & Tobago, Uruguay, Venezuela) and 31 source countries (Australia, Austria, Belgium, Canada, China, Czech Rep, Denmark, Finland,

France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, South Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, UK, US).

Separate regressions for each corruption variable are estimated in order to avoid multicollinearity. Multicollinearity problems exist for some of the variables in the baseline model in table 1 distorting their coefficients but this does not concern us, as multicollinearity between the control variables would have no impact on the coefficients of corruption variables that we are interested in. When the control variables (such as inflation and common religion, see Table 1) were found to be collinear with the corruption variables, however, they were excluded from the estimations. We estimate the above equation by using the Random Effects method applying the Generalized Least Square method. Potential Heteroskedasticity problems were resolved by using the Newey-West Heteroskedasticity and Autocorrelation Consistent Standard Errors. We confirmed stationarity by adopting the Levin, Lee and Chu and the Philips Perron methods.

4. Results and Conclusion

The results in Table 1 confirm the validity of the gravity model. The GDPs of both source and target countries have positive and significant coefficients. The geographical distance variable also has a negative and significant coefficient.

While it is not our purpose to discuss the control variables in details, the results produce some expected and some surprising results. The cultural similarity between source and target countries in terms of "common language" and "common religion" is a source of attraction for multinational companies. "Ethnic tensions" and "inflation" particularly in the target countries are a significant source of repulsion. "Landlockedness" has positive and consistently significant signs for the source countries, which indicate that FDI may substitute trade. Because transport cost is often larger for the landlocked countries, the source countries may prefer to invest in the target countries rather than exporting to them. "GDP growth rates" for the source countries are positive and mostly significant but for the target countries negative and mostly insignificant. These are surprising results as one would expect a positive link between FDI and economic growth in the target countries for two reasons. FDI could directly contribute to economic growth and faster economic growth indicates a healthy economy, which offers profitable investment opportunities for multinational companies and attracts more FDI. While the "oil" variable has negative and highly significant coefficients, it is collinear with the GDP (T) variable, which distorts its coefficients. This does not concern us as multicollinearity between the control variables would have no impact on the corruption variables that we are interested in. When we exclude GDP (T) and estimate the same regression, the coefficient of oil variable becomes positive. To check consistency of our results, we estimated the regressions with and without the oil variable. Although we do not report here, we confirm that the results for the corruption variables remained the same.

Table 1. Panel data gravity model estimates for the corruption variables

	1	2	3	4	5	6	7	8
Cons	-22.94	-13.43	-16.8	-10.6	-16.0	-15.0	-17.0	-8.18
	[-11.1]*	[-7.46]*	[-6.91]*	[-4.52]*	[-6.52]*	[-5.93]*	[-6.79]*	[-3.79]*
GDP (S)	0.47	0.38	0.45	0.39	0.44	0.44	0.46	0.36
	[13.8]*	[12.2]*	[12.0]*	[10.8]*	[11.9]*	[11.7]*	[12.1]*	[10.0]*
GDP (T)	0.72	0.70	0.55	0.56	0.52	0.53	0.53	0.56
	[17.4]*	[18.1]*	[11.3]*	[11.8]*	[10.9]*	[11.2]*	[10.9]*	[11.9]*
DISTANCE	-0.31	-0.69	-0.34	-0.61	-0.42	-0.43	-0.35	-0.71
	[-4.05]*	[-5.48]*	[-2.18]**	[-4.27]*	[-2.74]**	[-2.78]**	[-2.21]**	[-5.20]*
COMMON LANGUAGE	2.17	2.19	2.18	2.32	2.20	2.15	2.21	2.26
	[7.00]*	[7.02]*	[6.66]*	[7.00]*	[6.61]*	[6.39]*	[6.76]*	[6.80]*
OIL	-0.07	-0.07	-0.03	-0.03	-0.02	-0.02	-0.02	-0.03
	[-7.04]*	[-6.61]*	[-2.32]**	[-2.39]**	[-2.09]**	[-2.21]**	[-1.98]**	[-2.50]**
ETHNIC TENSIONS (T)	-0.46	-0.44	-0.44	-0.41	-0.51	-0.44	-0.49	-0.43
	[-8.61]*	[-7.68]*	[-5.43]*	[-5.23]*	[-6.46]*	[-5.65]*	[-6.12]*	[-5.34]*
ETHNIC TENSIONS (S)	-0.38	-0.39	-0.05	-0.02	-0.01	-0.00	-0.04	-0.01
	[-5.50]*	[-5.57]*	[-0.58]	[-0.31]	[-0.15]	[-0.07]	[-0.45]	[-0.15]
LAND-LOCK (T)	0.38	0.45	0.07	0.20	0.07	0.12	0.00	0.23
	[1.71]**	[2.02]**	[0.28]	[0.84]	[0.28]	[0.51]	[0.00]	[0.95]
LAND-LOCK (S)	0.43	0.51	0.42	0.42	0.37	0.40	0.39	0.46
	[2.57]**	[3.10]*	[2.41]**	[2.41]**	[2.07]**	[2.26]**	[2.25]**	[2.62]**
GDPgr (T)	-0.07	-0.07	-0.03	-0.04	-0.02	-0.05	-0.02	-0.05
	[-2.95]*	[-2.59]**	[-1.03]	[-1.33]	[-0.80]	[-1.45]	[-0.65]	[-1.49]

GDPgr (S)	0.22	0.06	0.25	0.20	0.38	0.36	0.29	0.17
	[2.24]**	[0.67]	[1.84]**	[1.54]	[2.79]**	[2.70]**	[2.06]**	[1.30]
INFLATION (T)	-0.10	-0.11	-0.15	-0.14		-0.14		-0.15
	[-10.1]*	[-9.96]*	[-4.83]*	[-5.13]*		[-4.75]*		[-5.29]*
INFLATION (S)	-0.04	-0.11		-0.11	-0.08	-0.07	-0.10	-0.13
	[-0.94]	[-2.24]**		[-2.05]**	[-1.42]	[-1.27]	[-1.90]**	[-2.34]**
COMMON RELIGION	1.00		1.31		1.29	1.29	1.30	
	[3.87]*		[5.71]*		[5.50]*	[5.25]*	[5.58]*	
COR 1 (T)	-0.08							
	[-4.72]*							
COR 1 (S)		-0.23						
		[-3.09]*						
COR 2 (T)			-0.16					
			[-2.05]**					
COR 2 (S)				-0.43				
				[-2.45]**				
COR 3 (T)					-0.01			
					[-0.30]			
COR 3 (S)						-0.06		
						[-0.78]		
COR 4 (T)							-0.24	
							[-2.64]**	
COR 4 (S)								-0.06
								[-0.43]
N	2362	2272	1523	1673	1616	1653	1456	1649
R^2	0.563	0.548	0.386	0.386	0.405	0.387	0.402	0.383
Wald-	1985	1860	721.0	704.1	665.4	713.4	676.3	686.2
Joint	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Wald-	122.1	73.45	47.70	20.39	42.54	35.21	46.12	14.34
dummy	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
AR (1)	38.21	37.21	16.12	19.84	19.23	18.42	15.82	19.26
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
AR (2)	23.95	23.18	5.396	7.880	7.879	6.674	5.642	7.436
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]

Notes: The independent variable is bilateral FDI stock between source and target countries. "*" is significant at 1 % level and "**" is significant at 10 % level. All variables are in logarithmic form. t-ratios are in parentheses.

Our results for the corruption variables confirm the findings of Bellos and Subasat (2011) and suggest that in Latin American countries high levels of corruption are associated with high levels of FDI stock. For the target countries, all corruption coefficients have negative signs and apart from "Cor 3" they are all statistically significant. These results suggest that corruption does not deter, in fact encourages, FDI in Latin America. Therefore, our results confirm that the positive correlation between corruption and FDI in transition countries is not necessarily due to their transition specific problems but such a relationship can be generalised to Latin America. In the case of source countries all corruption variables have negative signs and "Cor 1" and "Cor 2" have significant coefficients. These results confirm that high corruption levels in the source countries encourage multinational companies to invest more in Latin America.

The FDI enhancing aspect of corruption (both in source and target countries), demonstrated by our empirical results, contradicts the "sand the wheels" approach. The "grease the wheels" view, which argues that corruption can attract more FDI when there are distortions caused by low quality governance, is a realistic alternative. However, our empirical work does not provide evidence to prove the "grease the wheels" view as we have not established whether corruption compensates for poor governance in Latin America. The "grease the wheels" view does not suggest that corruption itself may be a source of attraction for multinational companies but offsets already existing distortions resulting from the low governance quality. Corruption would lower FDI in a country with relatively high quality of governance where corruption has no distortions to "grease".

Therefore we cannot rule out the possibility that corruption itself may be a source of enhanced investment opportunities for multinational companies. Corruption could be a source of rent not only for corrupt policy makers in the target countries but also for large multinational companies that could turn out to be "perpetrators" rather than being "victims". In countries where the "rule based governance" is replaced by the "relation-based governance",

policies are likely to favour large business and provide multinational companies opportunities for rent seeking activities (Li 2005).

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Notes

Note 1. Human Development Index method is used to average the corruption variables with different scales.

Note 2. See Kaufmann, Kraay and Zoido-Lobaton (1999) for a discussion of the problems inherent in making cross-country comparisons.

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