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Political Regime, Private Investment, and Foreign Direct Investment in Developing Countries

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Abstract

This paper uses annual aggregate data for 36 low or middle income countries covering the period 1995-2001 to investigate the effect of FDI on private investment. It also explores if the relationship between FDI and private investment is influenced by the nature of the political regime, using four governance measures (voice and accountability, regulatory quality, political stability, and control of corruption) to distinguish between 'market-friendly' (high or good governance values) and 'market-unfriendly' (low governance) regimes. The results, which hold for all of the governance measures, show that private investment is more important than FDI in terms of the contribution to total investment, and that FDI inflows and private investment are higher in countries with good governance. Interestingly, the findings demonstrate that FDI tends to displace domestic private investment, and this 'crowding out' effect is greater in countries with good governance.

Keywords: FDI, investment sources, finance

JEL classification: E22, O16

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1 Introduction

Investment is a key determinant of economic growth, and alternative sources of investment finance can have different effects on total investment (depending on how they relate to each other, and how each responds to market characteristics). A private agent in a developing country considering undertaking an investment has open to them three principal means of financing. First, they can consider domestic financing, either borrowing on domestic markets or accessing funds from family or other informal sources. Second, they can seek a foreign partner and attract foreign direct investment (FDI). Finally, they can seek to borrow abroad for foreign debt financing. An important concern in assessing the impact of a particular source of financing on total investment is whether it adds to or substitutes for alternative sources of investment finance. This paper concentrates on the relationship between FDI and private investment in a sample of 36 developing countries in the 1990s.

In evaluating the impact of FDI on economic growth in a developing country the question arises whether FDI crowds in or displaces domestic investment? Although this is an important issue, there are surprisingly few empirical studies of the impact of FDI on domestic investment in developing countries (Nunnenkamp 2004). If FDI crowds out domestic investment, total private investment rises by less than the FDI and the benefits for the country are reduced (Mišun and Tomšík 2002 find evidence for crowding-out in Poland in the 1990s). If FDI crowds in (stimulates) private investment, total investment increases by more than the FDI and the benefits are enhanced. Mišun and Tomšík (2002) find crowding in for Hungary and the Czech Republic in the 1990s; Kim and Seo (2003) find that FDI crowds in domestic investment in South Korea for the period 1985-99. It may be the case that FDI and domestic private investment are effectively independent. Agosin and Machado (2005) find that FDI has no significant effect on domestic private investment for countries in Africa, Asia and Latin America over 1971-2000, although there seems to be crowding out of domestic investment by FDI in Latin America in some sub-periods.

The relative importance of alternative sources of financing for private investment, and how they interact, may be influenced by the quality of governance (as an indicator of how market friendly the political regime is). Existing studies either do not include governance variables, or do not consider that governance may affect the relationship between alternative sources of financing private investment in developing countries. Political uncertainty and poor governance (such as weak property rights, high corruption or excessive regulation) have been found to discourage domestic private investment and FDI (Mauro 1995; Campos et al. 1999). This paper considers whether, in addition, the relationship between FDI and private investment is affected by the nature of the political regimes. We characterize regimes with high (good) values of governance indicators as market-friendly or favourable to investment, while regimes with low values of governance are market-unfriendly or unfavourable to investment.

The paper is structured as follows. Section 2 outlines the theoretical motivation for a link between political regime and the source of private investment, and reviews the existing literature on FDI and domestic investment. Section 3 discusses the data and empirical specification and presents the results of the analysis of the relationship between private investment and FDI under different governance regimes using annual data for 36 low or middle income countries over 1995-2001. Section 4 provides conclusions and discusses implications for financing private investment.

2 Political regimes and sources of investment finance

It is well established in the literature that institutions are a significant determinant of both FDI and domestic investment in developing countries (Blonigen 2005; Dawson 1998). In particular, political instability has a negative and statistically significant impact on domestic investment in developing countries (Gyimah-Brempong et al. 1999; Rogoff and Reinhart 2003). On a related theme, corruption (associated with poor governance) increases costs of production and discourages domestic investment (Mauro 1995; Campos et al. 1999; Wei and Wu 2001). Protection of property rights reduces risks and increases investment (Li and Resnick 2003). However, Hausmann and Fernández-Arias (2000) argue that the share of FDI in total capital flows tends to be larger in countries that are riskier, financially underdeveloped and institutionally weak; the share of FDI in investment is not a reliable predictor of good governance.

There are various ways of distinguishing the nature of political regimes, and one possible issue to consider is the policy stance towards markets and incentives or support provided to the private sector. Regimes that are more market-oriented and supportive of the private sector are likely to be more attractive to private investors. Dalmazzo and Marini (2000) consider the choice of investment finance under political uncertainty, where a 'market-friendly' regime is defined as one where the probability of a populist regime (one that is labour-friendly or capital-unfriendly) coming to power is effectively zero. A 'market-unfriendly' regime is one where there is a positive probability of a populist regime coming to power.

Dalmazzo and Marini (2000) provide a model that generates predictions on the relative importance of three different sources of investment financing – domestic capital self-financing (DSF), FDI financing (FDI) and foreign debt financing (FDF) – under political uncertainty. As their concern is with the effect of uncertainty, they derive results under a politically unstable regime (i.e., where there is a positive probability of a populist government being in power after investment decisions are made). The implication of political instability is that private investors will seek out foreign partners (FDI) or lenders (FDF) who can exert pressure on the government to protect the value of the investment.

A foreign partner can impose sanctions whenever the country considered violates some international agreement. For this reason, entering into an agreement with a foreign investor or lender can provide some protection to domestic capitalists should a populist (or market-unfriendly) regime gain power. Thus, the more likely is a populist government, the greater the incentive for foreign financing over domestic financing. If the capitalist sells the project to a foreign investor (FDI) and a market-unfriendly government comes into office, the foreign investor can demand the application of (trade) sanctions against the country. If the capitalist borrows abroad to finance the project (FDF) and a market-unfriendly government comes into office, any attempted repudiation of the outstanding debt obligations make the country liable to sanctions. The capitalist remains in full control of the project or the populist government decides to default, leading to sanctions. In either case, the capitalist (domestic investor) has greater bargaining power than under domestic financing.

To suggest hypotheses regarding the importance of each source of financing under favourable (market-friendly) and unfavourable (market-unfriendly) regimes for investment, Görg et al. (2007) solve the model also for politically stable regimes (i.e.,

where there is a zero probability of a populist government). Görg et al. (2007) summarize the predicted 'ranking' of sources of finance under each regime in terms of the relative impact on the level of private investment. Foreign sources of financing are attractive because they confer protection to investors, so (FDF and FDI) will be more attractive than domestic finance under market-unfriendly regimes. Under market-friendly regimes, the model predicts that foreign borrowing will be the most attractive source of financing, but there will be indifference between FDI and private domestic financing. The broad conclusion is that foreign financing will be relatively more attractive than domestic financing under unfavourable as compared to favourable regimes; in respect of FDI, this is consistent with Hausmann and Fernández-Arias (2000).

The effect of FDI on total (private) investment depends on several factors, including recipient country business environment and economic policy, types of FDI and the strength of domestic firms, but is also influenced by the relationship between FDI and domestic private investment. FDI that brings in goods and services that are new to a host country (particularly in high technology) usually has favourable (crowding in) effects on capital formation (Agosin and Mayer 2000). On the other hand, FDI in sectors competing with domestic companies reduces investment opportunities for domestic investors (Mišun and Tomšík 2002). The contribution to total capital formation of such FDI is likely to be less than the FDI flow itself (crowding out effect). Even where FDI does not displace private investment, FDI may not stimulate new downstream or upstream production and so may fail to exert a positive effect on private investment (Agosin and Machado 2005). Potential spillovers from FDI to domestic firms may not be sufficient to stimulate private domestic investment; the contribution of FDI to technology transfer may be largely restricted to subsidiaries (Almeida and Fernandes 2008), and spillovers may not significantly improve efficiency of domestic firms (Girma and Gong 2008).

In countries with good governance (e.g., political stability, low corruption, strong property rights), levels of private investment and FDI will be higher than in countries with poor governance. However, the FDI impact on private investment can be either positive or negative, depending on the strength and capability of domestic producers (to compete with, supply to or absorb spillovers from FDI) and the type of FDI (such as resource extraction or export manufacturing). Strong linkages reinforce the crowding in effect, whereas crowding out is more likely if FDI is in the form of M&A (Nunnenkamp 2004).

Most studies addressing the impact of FDI on the level of (total) private investment for developing countries are based on cross-country data. Borensztein et al. (1998) test the impact of FDI on domestic investment for 69 developing countries over the period 1970-89. They find that FDI stimulates total investment so that FDI crowds in domestic investment (but results are not robust to model specification). Agosin and Mayer (2000) develop a model of investment in developing countries to determine the long-term crowding in and crowding out effect of FDI on domestic investment. Agosin and Machado (2005) apply the model to panel data for the period 1971-2000 for 12 countries in Africa, Asia and Latin America. They find that FDI displaces domestic investment in Latin America but is independent in Africa and Asia (total investment increases by the amount of FDI); the crowding out effect of FDI in Latin America appears restricted to the 1970s, and may be present in Africa in the 1990s.

A positive impact of FDI on domestic investment is not assured; in some cases, total investment increase by less than FDI, as Agosin and Mayer (2000), Agosin and Machado (2005) and Mišun and Tomšík (2002) find. None of these studies consider specifically how the political regime (governance) may influence the relationship between domestic private investment and FDI. The findings in Appendix A suggest that good governance stimulates both private investment and FDI, but the remainder of the paper focuses on the impact of FDI on domestic private investment under different regimes for investment.

3 Empirical specification and results

The sample comprises 36 low and middle income countries, 13 in Latin America and the Caribbean, 8 in Asia, 10 in Europe (mostly transition economies) and 5 in Africa (see Appendix A). The period covered in 1995-2001 as the governance data used are only available since 1995. Following Agosin and Machado (2005) we begin with the identity: *total investment* (I_t) = *domestic investment* ($I_{d,t}$) + *FDI* (F_t), expressed more generally as (where G is growth of real output):

$$I_t = f(G_{t-1}, G_{t-2}, I_{d,t-1}, I_{d,t-2}, F_t, F_{t-1,} F_{t-2}) \qquad [1]$$

As one cannot estimate an underlying identity, a reduced form behavioural relationship including governance indicators (GI) is used to analyse the FDI effect on private investment in a manner similar to Driffield and Hughes (2003):

$$PV_{i,t} = \beta_0 + \beta_1 G_{i,t-1} + \beta_2 PUB_{i,t-1} + \beta_3 SDEBT_{i,t-1} + \beta_4 FDI_{i,t-1} + \beta_5 GI + \beta_6 GI*FDI_{i,t-1} + \mu_i + \varepsilon_{i,t} \qquad [2]$$

Variables are measured as percentages of GDP and $PV_{i,t}$ is private investment, $FDI_{i,t}$ is net FDI inflows,[1] $PUB_{i,t-1}$ is public investment and $SDEBT_{i,t-1}$ is private external debt stock. Four governance indicators (GI) are used: voice and accountability (VA), political stability and absence of violence (PS), regulatory quality (RQ), and control of corruption (CC). The binary variable *GI* (= *VA, PS, RQ, CC*) is equal to 1 if the country has a 'high' value of the governance indicator and 0 otherwise; μ_i is a country specific time invariant effect, and $\varepsilon_{i,t}$ is the remaining white noise error. All independent variables are lagged one period (year).[2] Appendix A discusses the investment and governance data, with descriptive statistics and analysis of the contribution of alternative sources of finance to total investment.

In estimating [2], we expect a positive coefficient on real GDP growth, i.e., the propensity for private investment should tend to be increasing in income. The effects of public investment and external debt are *a priori* unknown, as the coefficients can be either positive or negative. We are especially interested in the estimated coefficient on

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1 The foreign investor's share must exceed 10% to be FDI, and the intention can be either greenfield or 'merger and acquisition' (M&A) investment.

2 This serves a number of purposes – partially accounts for potential endogeneity and allows for the explanatory variables taking time to influence private investment (behaviour).

FDI inflows, which can also be either positive or negative, and how this coefficient (i.e., the FDI effect on private investment) is affected by the inclusion of governance indicators.

Fixed and random effects estimators are used to allow for unobserved country-specific factors. If there is a correlation between country specific factors (unobserved specific effects) and the explanatory variable(s) the fixed effects model (FE) generates consistent estimators. If the correlation is zero, the random effects (RE) model generates consistent and efficient estimators (FE estimates are consistent but inefficient). The Hausman test is used to select between the alternative estimators (Wooldridge 2002) and supports the RE model in our case (the Koenker-Bassett and LM tests suggest that the estimates are efficient and consistent). A robustness check of regional effects on the private investment impact of FDI is conducted by dividing the countries into four regions: Asia, Africa, Europe and Latin America.

Table 1 presents estimation results using RE for the sample period 1995-2001 (further results are available in Görg et al. 2007). The first column excludes governance variables, introduced individually in subsequent columns. The coefficient on (lagged) real GDP growth is positive and significant, consistent with Cardoso (1993) and Oshikoya (1994), at 0.29 in all cases. The coefficient on (lagged) FDI is consistently negative and statistically significant with a very similar value in all regressions; FDI appears to 'crowd out' private investment in developing countries, as Agosin and Machado (2005) found. The other explanatory variables, notably the four measures of governance, are not statistically significant.

The estimated equation is not a log-linear model so the estimated coefficients are not elasticities. To clarify the effects, we evaluate the coefficients at mean values of variables. On average, a 10 per cent increase in (real) economic growth is associated with a 0.6 per cent increase in private investment (as a share of GDP), holding all other variables constant. A 10 per cent increase in FDI/GDP is associated with a 0.5 per cent fall in private investment.

The governance indicators themselves appear to have no effect on the level of private investment, i.e., no intercept effect in Table 1, but may affect the slope with respect to FDI. To test if the relationship between FDI and private investment differs under favourable regimes for investment (when GI = 1) interactive terms are included. The results in Table 2 (RE estimation) confirm the previous significant coefficients on *G* and FDI, but show that political regimes (or governance) appear to matter as both intercept and slope effects are significant. Taking the voice and accountability (VA) indicator as an example, the estimate of the extra private investment in 'high' compared to 'low' VA countries is 5.6; the intercept coefficient is similar for the other GI measures. On average, private investment as a percentage of GDP in favourable regimes is six percentage points higher than in unfavourable regimes, *ceteris paribus*. This confirms that the level of private investment is higher under business-friendly regimes for investment, as found in Mauro (1995), Dawson (1998), Gyimah-Brempong et al. (1999) and Campos et al. (1999).

Table 1: FDI and private investment: random effects estimates, 1995-2001

Dependent variable: PV/GDP

Variables	Governance indicator (GI)				
	none	VA	PS	RQ	CC
G (-1)	**0.29**	**0.29**	**0.29**	**0.29**	**0.29**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
SDEBT (-1)	0.03	0.04	0.03	0.04	0.03
	(0.14)	(0.12)	(0.17)	(0.13)	(0.11)
PUB (-1)	-0.03	0.04	-0.01	0.03	0.03
	(0.87)	(0.84)	(0.98)	(0.88)	(0.84)
FDI (-1)	**-0.26**	**-0.28**	**-0.28**	**-0.28**	**-0.27**
	(0.02)	**(0.01)**	**(0.01)**	**(0.01)**	**(0.02)**
Constant	**14.37**	**13.04**	**13.48**	**12.58**	**12.88**
	(0.00)	**(0.00)**	**(0.00)**	**(0.00)**	**(0.00)**
GI		1.99	1.72	2.43	2.91
		(0.16)	(0.21)	(0.19)	(0.13)
R^2	0.69	0.72	0.71	0.74	0.75
Hausman test statistic	0.76	1.12	1.32	0.98	0.31
	(0.94)	(0.89)	(0.86)	(0.91)	(0.99)
Koenker-Bassett test statistic	0.05	0.06	0.06	0.05	0.05
	(0.20)	(0.15)	(0.14)	(0.15)	(0.16)
LM test (Chi-squared) statistic	1.24	1.86	1.90	1.89	1.16
Number of observations	216	216	216	216	216

Notes: Numbers in parentheses are P-values (significant coefficients in **bold**). The 5% critical value of the chi-squared distribution with four degrees of freedom is 9.49, so the Hausman test statistic shows that the RE model is preferred over FE. The Koenker-Bassett statistic suggests that heteroscedasticity is not a problem and the LM test implies no evidence of autocorrelation (the 5% critical value of Chi-squared distribution with one degree of freedom is 3.84).

The interaction (slope) terms are also significant and suggest that the crowding-out effect of FDI is greater in high GI countries – the interaction terms reinforce the negative coefficient on FDI. For example, in 'low' VA countries, an increase in FDI/GDP by 10 percentage points displaces private investment/GDP by 1.4 percentage points (β_4) whilst in 'high' VA countries each extra 10 percentage points of FDI/GDP 'crowds out' private investment/GDP by 1.8 percentage points ($\beta_4 + \beta_9$). Similar effects are observed for the other GI measures, although the FDI crowding-out effect is more pronounced in high GI countries using the PS and CC measures. Private investment overall is nevertheless higher in high GI countries, as the positive intercept effect exceeds the negative FDI effect, even if FDI is higher in high GI countries (see Table A1).

Two results are striking. First, the intercept term is only significant when the interaction term is also included. Furthermore, the intercept term has a high value relative to the difference in mean levels of PV/GDP between high and low GI countries (Table A1). This suggests that FDI plays an important role in the relationship between political regime and private investment. Second, FDI has a greater crowding out effect on private investment in high as compared to low GI countries. This suggests the nature of the relationship: the features of favourable regimes (good governance) that promote private

Table 2: Political regime, FDI and private investment: RE, 1995-2001

Dependent variable: PV/GDP

Variables	Governance indicator (GI)			
	VA	PS	RQ	CC
G (-1) [$_1$]	**0.26 (0.00)**	**0.25 (0.00)**	**0.27 (0.00)**	**0.29 (0.00)**
SDEBT (-1) [$_2$]	0.01 (0.54)	0.02 (0.28)	0.01 (0.59)	0.03 (0.13)
PUB (-1) [$_3$]	-0.04 (0.81)	-0.08 (0.62)	-0.05 (0.76)	-0.01 (0.96)
FDI (-1) [$_4$]	**-0.14 (0.07)**	**-0.12 (0.05)**	**-0.11 (0.07)**	**-0.16 (0.09)**
Constant	**13.29 (0.00)**	**13.40 (0.00)**	**12.72 (0.00)**	**12.76 (0.00)**
VA [$_5$]	**5.69 (0.00)**			
PS [$_6$]		**5.87 (0.01)**		
RQ [$_7$]			**5.86 (0.04)**	
CC [$_8$]				**6.18 (0.00)**
VA*FDI (-1) [$_9$]	**-0.04 (0.03)**			
PS*FDI (-1) [$_{10}$]		**-0.10 (0.02)**		
RQ*FDI (-1) [$_{11}$]			**-0.02 (0.06)**	
CC*FDI (-1) [$_{12}$]				**-0.08 (0.04)**
R^2	0.88	0.82	0.90	0.82
Hausman test statistic	4.84 (0.45)	2.30 (0.81)	4.06 (0.54)	6.90 (0.23)
Koenker-Bassett test statistic	0.12 (0.23)	0.13 (0.20)	0.16 (0.25)	0.11 (0.26)
LM test (Chi-squared) statistic	2.64	2.18	2.02	2.71
Chi-squared test:	0.41	0.53	0.89	0.60
H_0: $_4 = _4 + _9$; $_4 = _4 + _{10}$; $_4 = _4 + _{11}$; $_4 = _4 + _{12}$	(0.53)	(0.44)	(0.35)	(0.40)
Number of observations	216	216	216	216

Notes: As for Table 1. The Chi-squared test supports the equal FDI effect on private investment in both regimes: the 5 per cent critical value of Chi-squared distribution with one degree of freedom is 3.84.

investment also attract FDI; at a margin, FDI and private investors compete over attractive investment opportunities, so FDI displaces local investment. In this context it is interesting that public investment and debt are insignificant (Cohen 1991 also finds that external debt has no impact on the investment). Economic growth is the only other significant explanatory variable (and the coefficient is consistent for all GI measures). Domestic investment responds to economic growth (Cardoso 1993; Oshikoya 1994) and so does FDI, but opportunities are limited.

In all estimations, Koenker-Bassett and LM tests are used to check for problems of heteroscedasticity and (first-order) autocorrelation: if the errors (from the RE model) are not independent and identically distributed the estimators are inefficient (but still consistent). In all estimated equations, the nulls of no heteroscedasticity or (first-order) autocorrelation are accepted so the estimators are consistent and efficient. It is possible

that past private investment could influence current private investment (Driffield and Hughes 2003) so that a dynamic panel estimator is appropriate. As the LM tests clearly accept the null of no autocorrelation a dynamic model (with one lagged endogenous variable as an additional independent variable in the model) is not required (Carstensen and Toubal 2004).

Regional effects for the FDI impact on domestic investment

The impact of FDI on private investment may vary across regions, and such variations may be related to governance. To test this, the econometric model to be estimated is specified as follows:

$$PV_{i,t} = \beta_0 + \beta_1 GGDP_{i,t-1} + \beta_2 PUB_{i,t-1} + \beta_3 SDEBT_{i,t-1} + \beta_4 FDI_{i,t-1} + \beta_5 ASIA + \beta_6 AFRICA + \beta_7 EUROPE + \beta_8 ASIA*FDI_{i,t-1} + \beta_9 AFRICA*FDI_{i,t-1} + \beta_{10} EUROPE*FDI_{i,t-1} + \mu_i + \varepsilon_{i,t} \quad [3]$$

All variables are as previously defined (and lagged one year) except *ASIA* is a dummy variable that is 1 for Asian countries and 0 otherwise, *AFRICA* is a dummy variable that is 1 for African countries and 0 otherwise, *EUROPE* is a dummy variable that is 1 for European countries and 0 otherwise (Latin America is the omitted or reference region).

Table 3 provides RE results (as supported by the Hausman test). The coefficients on real GDP growth (positive) and FDI/GDP (negative) are statistically significant at the 5 per cent level in all specifications (as previously). None of the regional intercept dummies are statistically significant. i.e., there appear to be no regional effects on the level of private investment. When regional interaction effects with FDI are included, however, both intercept and slope dummies become significant.

The results affirm the significance of economic growth in encouraging private investment (as found in the previous literature), and the coefficient is remarkably robust across all specifications (tables). Public investment and external debt appear to have no impact on private investment. As could be expected, the level of private investment is significantly higher (positive intercept dummies) in Asia and Europe relative to Latin America (the Africa effect is insignificant). Note that regional effects on private investment are not evidently related to governance as all regions have high and low governance countries (see Appendix A).

As previously, FDI appears to 'crowd out' private investment (a negative and significant coefficient). The interaction terms are all negative and significant suggesting that, relative to Latin America, the crowding out effect is greater in Asia, Europe and Africa (the coefficient is roughly doubled in all cases). As observed above, these regional effects are unlikely to be explained by governance scores directly as all regions have high and low governance countries. It is possible that the tendency for investment and FDI to be higher in high governance countries is more pronounced (i.e., within region differences are greater) in Asia and Europe compared to Latin America, especially as the former two regions have significantly higher levels of investment. In this case, the interaction term may be driven by the high governance (and investment)

Table 3: FDI and private investment: regional effects, 1995-2001

Dependent variable: PV/GDP

Variables	Random effects		
	1	2	3
G (-1) [$_1$]	**0.29 (0.00)**	**0.29 (0.00)**	**0.29 (0.00)**
SDEBT/GDP (-1) [$_2$]	0.03 (0.14)	0.02 (0.30)	0.02 (0.36)
PUB/GDP (-1) [$_3$]	-0.03 (0.87)	-0.03 (0.89)	-0.03 (0.84)
FDI/GDP (-1) [$_4$]	**-0.26 (0.02)**	**-0.27 (0.01)**	**-0.15 (0.06)**
Constant	**14.37 (0.00)**	**13.82 (0.00)**	**12.61 (0.00)**
ASIA [$_5$]		1.63 (0.41)	**4.46 (0.03)**
AFRICA [$_6$]		-1.54 (0.47)	1.18 (0.60)
EUROPE [$_7$]		1.86 (0.27)	**7.24 (0.00)**
ASIA*FDI/GDP (-1) [$_8$]			**-0.16 (0.05)**
AFRICA*FDI/GDP (-1) [$_9$]			**-0.19 (0.09)**
EUROPE*FDI/GDP (-1) [$_{10}$]			**-0.12 (0.02)**
R^2	0.69	0.74	0.92
Hausman test statistic	0.76 (0.94)	1.80 (0.77)	9.27 (0.24)
Koenker-Bassett test statistic	0.05 (0.20)	0.04 (0.13)	0.04 (0.17)
LM test (Chi-squared) statistic	1.24	2.47	2.01
Chi-squared test: H_0: $_4 = _4 + _8$			0.39 (0.51)
Chi-squared test: H_0: $_4 = _4 + _9$			0.51 (0.46)
Chi-squared test: H_0: $_4 = _4 + _{10}$			0.81 (0.35)
Number of observations	216	216	216

Notes: As for Table 2. The Koenker-Bassett and LM tests indicate no heteroscedasticity and autocorrelation problems.

countries in each region, and this is consistent with the earlier results that crowding out is more pronounced in countries with better governance (presumably because of competition for the marginal projects). As Africa would be expected to have lower governance, on average, than Latin America, the greater crowding out may seem surprising. However, the coefficient is only just significant, the small African sample is not representative of the poorer sub-Saharan African countries (it comprises Côte d'Ivoire, Mauritius, Senegal, South Africa and Tunisia), and again the result may reflect the high governance and investment countries in the sample (Mauritius, South Africa and, for most measures, Tunisia).

4 Concluding remarks

The paper investigates the effect of FDI on domestic private investment under different governance regimes using the World Bank's governance indicators on annual aggregate data over the period 1995-2001 for 36 low and middle income countries. Given the relatively short period and heterogeneous sample, the results should be considered no more than indicative. Nevertheless, some consistent findings emerge:

1. In developing and transition countries, domestic private investment is more important than FDI in terms of contribution to total investment.

2. Total domestic private investment and FDI are higher under market-friendly regimes (those with high governance scores). Governments that provide a business-friendly environment for investors do appear to achieve higher level of investment, as might be expected.

3. As expected, economic growth encourages FDI and private investment. Public investment and external debt do not appear to have any effect on private investment.

4. FDI tends to crowd out domestic private investment, and this 'crowding out' effect is greater in countries with high governance scores, and lower in Latin America compared to Asia, Europe and Africa (in the sample).

Only the last of these findings can be considered surprising; crowding out implies that total investment increases by less than the FDI, as other private investment is reduced, so why should this effect appear more pronounced in high governance countries? A plausible explanation is because levels of investment (private and FDI) are greater under high governance, competition for profitable opportunities is greater and, at the margin, foreign investors command the better opportunities. Foreign firms can increase the costs to local firms of obtaining finance or employing skilled labour (Kumar 2003). If foreign firms have a productivity advantage over their domestic counterparts, it is likely that they will be willing to pay higher prices for capital goods. A possible result (in industries with significant foreign penetration) is that the cost of capital goods will increase in the domestic sector, and investment by domestic firms will decline (Driffield and Hughes 2003).

A common assumption that underpins policy toward FDI in most developing countries – that a liberal policy toward FDI is sufficient to ensure crowding in (Agosin and Mayer 2000) – is not supported by the analysis, to the extent that higher governance scores and growth are associated with more liberal policies towards FDI. There are market failures in the investment process and differences between foreign and domestic investors, suggesting a role for government intervention to regulate, attract or promote specific types of FDI (Kumar 2003). For FDI to help achieve the development goals of increasing economic growth and raising domestic investment, two policies are helpful (Nunnenkamp 2004). First, developing countries, especially those with weak governance and institutions, need to be attractive to foreign investors. They could reduce barriers to entry and promote a better business environment; these will attract foreign investors and contribute to growth and improvements in governance.

Second, governments may wish to favour FDI that does not displace domestic firms (e.g., high technology industry) and/or that promotes linkages with local producers. The linkage may take the form of supply contracts, technology transfer, skill upgrading and training for labour. Targeted fiscal incentives for investment are one policy instrument, but these should not discriminate against domestic investors as it is also important to provide appropriate support to the development of domestic firms. Crowding out may be more likely if FDI is in the form of M&A activities, such as acquisitions of distressed banking and corporate assets in Thailand after 1997 (IMF 2003). Unlike greenfield

investment, this type of FDI does not directly contribute to physical capital or new linkages so is less likely to encourage crowding in (World Bank 2001).

The analysis contributes to understanding the FDI and private investment relationship, and perhaps most importantly suggests that it may be unreasonable to expect both to increase together. Foreign investors, especially multinational firms, have advantages over domestic investors; typically, they have greater access to investment finance, technology and global markets. In any country, foreign investors will be in a stronger position to capture the best investment opportunities. In relatively low income countries with weak governance, domestic investors have an incentive to seek foreign partners (joint ventures may be a good option). As an economy grows and the quality of governance and institutions improves, it will be more attractive to foreign investors, but the need or incentive for domestic investors to seek foreign partners is lessened. In such an environment, to minimize adverse effects of crowding out the most important policy is to ensure opportunities for domestic investors to enable them to compete effectively for the best investment opportunities. In some cases this implies joint ventures, but more generally it implies that investment incentives do not discriminate against domestic investors.

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Appendix A: data description

The data covers 1995-2001 for 36 low or middle income countries[3] chosen on the basis of data availability (countries for public investment and inflows of FDI, and period for governance data). Sample selection bias is possible as the middle income countries are over-represented in our sample (relative to the sample from which governance measures are taken), while low income countries are under-represented (see Appendix C). The period of analysis starts from 1995 as the governance data used (see below) are not available for earlier years. The countries consist of 13 Latin American and Caribbean countries (Argentina, Bolivia, Chile, Costa Rica, El Salvador, Guatemala, Jamaica, Mexico, Panama, Paraguay, Peru, Uruguay, and Venezuela), 8 countries from Asia (Indonesia, India, Iran, Kyrgyz Republic, Pakistan, Philippines, Sri Lanka, and Thailand), 10 countries from Europe (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Moldova, Poland, Romania, Slovak Republic, and Turkey) and 5 African countries (Côte d'Ivoire, Mauritius, Senegal, South Africa, and Tunisia).

We measure the sources of finance as follows. Net inflows of FDI (in constant 2000 US dollars) adjusted by GDP (in constant 2000 US dollars) is the standard measure of FDI financing (Agosin and Machado 2005; Mišun and Tomšík 2002), expressed as a percentage of GDP. Private (non-guaranteed) long term external debt (in current US dollars adjusted by CPI for 2000 = 100) as a percentage of GDP is used as the measure of (private) foreign debt. Unfortunately, external debt data from the World Bank and International Monetary Fund (IMF) do not provide a measure of *new* private international borrowing so we do not have any direct measure of foreign debt financing (FDF). Similarly, as there is no direct measure of domestic capital-self financing (DSF), we calculate private investment (PV) as:

$$PV = \textit{total investment} - \textit{net inflows of FDI} - \textit{public investment}$$

This represents domestic private investment however financed (it is not possible to distinguish domestic and foreign finance). Thus, PV is calculated from gross fixed capital formation minus net inflows of FDI and public investment, and is expressed as a percentage of GDP (where all measures are in current US dollars).

Annual data over 1995-2001 are from World Development Indicators (World Bank, 2004) and Government Finance Statistics (IMF 2005). GDP growth in constant 2000 US dollars is the measure of market potential (Tuman and Emmert 1999; Gastanaga et al. 1998; Agosin and Machado 2005).

Following recent studies (e.g., Hausmann and Fernández-Arias 2000), we utilize the World Bank's governance indicators (Kaufmann et al. 2005) covering 209 countries for 1996, 1998, 2000, and 2002 to capture features of the political regimes for investment. The six governance indicators (GI) are based on information from cross-country surveys and polls of experts (e.g., Freedom House, World Economic Forum and European Bank for Reconstruction and Development), and defined in Appendix B. Four of the governance measures are selected for analysis: voice and accountability (VA), political stability and absence of violence (PS), regulatory quality (RQ), and control of

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3 The World Bank defines low or middle income countries as developing countries with 1995 per capita incomes of less than US$765 (low) and US$9,385 (middle) respectively.

corruption (CC). There is positive correlation among the measures, lowest for PS and RQ and around 0.7 for all other pairs (Görg et al. 2007, who also provide more discussion and analysis of the measures). Countries are classified as 'good' (favourable) and 'bad' (unfavourable) regimes for investment according to whether their average percentile rank (1996-2002) for the governance measures are 'High' (above the 50th percentile rank) or 'Low' (below the 50th percentile rank).

Voice and accountability

High: Argentina, Bolivia, Bulgaria, Chile, Costa Rica, Czech Republic, El Salvador, Estonia, Hungary, India, Jamaica, Mauritius, Mexico, Panama, Philippines, Poland, Romania, Slovak Republic, South Africa, Thailand, Uruguay

Low: Côte d'Ivoire, Croatia, Guatemala, Indonesia, Iran, Kyrgyz Republic, Moldova, Pakistan, Paraguay, Peru, Senegal, Sri Lanka, Tunisia, Turkey, Venezuela

Political stability

High: Argentina, Bulgaria, Chile, Costa Rica, Croatia, Czech Republic, El Salvador, Estonia, Hungary, Jamaica, Kyrgyz Republic, Mauritius, Panama, Poland, Romania, Slovak Republic, Thailand, Tunisia, Uruguay

Low: Bolivia, Côte d'Ivoire, Guatemala, India, Indonesia, Iran, Mexico, Moldova, Pakistan, Paraguay, Peru, Philippines, Senegal, South Africa, Sri Lanka, Venezuela, Turkey

Regulatory quality

High: Argentina, Bolivia, Chile, Costa Rica, Croatia, Czech Republic, El Salvador, Estonia, Guatemala, Hungary, Jamaica, Mauritius, Mexico, Panama, Peru, Philippines, Poland, Slovak Republic, South Africa, Sri Lanka, Thailand, Tunisia, Turkey, Uruguay

Low: Bulgaria, Côte d'Ivoire, India, Indonesia, Kyrgyz Republic, Moldova, Pakistan, Paraguay, Romania, Senegal, Venezuela, Iran

Control of corruption

High: Chile, Costa Rica, Croatia, Czech Republic, Estonia, Hungary, Mauritius, Peru, Poland, Slovak Republic, South Africa, Sri Lanka, Tunisia, Turkey, Uruguay

Low: Argentina, Bolivia, Bulgaria, Côte d'Ivoire, El Salvador, Guatemala, India, Indonesia, Iran, Jamaica, Kyrgyz Republic, Mexico, Moldova, Pakistan, Panama, Paraguay, Philippines, Romania, Senegal, Thailand, Venezuela

To assess the relative importance of private investment (PV) and FDI in *high* and *low* countries, a two-sample *t*-test with different population variances is used. The tests are of the null hypotheses of no difference between means of PV and FDI (both measured as percentages of GDP) in the two sub-samples, against the alternative that the means are different. The results in Table A1 suggest that the levels of PV and FDI are typically greater under *high* as compared to *low* governance regimes for investment. An improvement of the governance measure encourages both private investment and FDI, in line with previous studies (Dawson 1998; Li and Resnick 2003). The average PV/GDP is considerably greater than FDI/GDP in all cases, and total (private) investment is higher under 'favourable' regimes for investment (*high*) as both levels of private investment and FDI are higher than those of the 'unfavourable' regime (*low*). Tables A2 and A3 provide summary statistics and correlations for the main variables.

Table A1: Difference in means of PV and FDI in different regimes

Governance	PV/GDP			FDI/GDP		
indicator	Mean	S.D.	t	Mean	S.D.	t
high VA	15.72	5.44	2.54*	3.93	3.04	5.45*
low VA	14.09	4.66		2.15	2.13	
high PS	16.01	5.26	3.93*	3.49	3.01	2.20*
low PS	13.51	4.69		2.72	2.48	
high RQ	15.74	5.17	3.35*	3.71	2.94	5.15*
low RQ	13.46	4.86		2.01	2.13	
high CC	16.91	4.36	5.24*	3.48	2.71	1.69**
low CC	13.7	5.32		2.97	1.63	

Notes: S.D. is standard deviation and t is the value of the t-test for significance of differences in means, where * and ** indicate significant at 5 and 10 per cent level, respectively (two-tailed test).

Table A2: Descriptive statistics

Sample: 36 countries and 1995-2001

Variable	Mean	Max	Min	S.D.
PV/GDP	15.04	34.42	3.66	5.18
FDI/GDP	3.19	12.88	-2.76	2.83
GGDP	3.15	10.62	-13.12	3.71
SDEBT/GDP	13.12	89.57	0.15	15.29
PUB/GDP	3.06	16.69	0.01	2.48

Source: World Bank (2004), IMF, and the author's computation.

Table A3: Correlations between main variables

Sample: 36 countries and 1995-2001

	PV/GDP	GGDP	SDEBT/GDP	FDI/GDP	PUB/GDP
PV/GDP	1				
GGDP	0.19	1			
SDEBT/GDP	0.15	-0.01	1		
FDI/GDP	-0.33	-0.05	0.10	1	
PUB/GDP	-0.06	0.01	-0.06	-0.20	1

Source: World Bank (2004), IMF, and the author's computation.

Görg et al. (2007) investigate the relative importance of sources of financing of private investment under (un)favourable regimes for investment, by separately estimating the private investment and FDI equations following the model of Oshikoya (1994). The findings suggest that economic growth is a key determinant of FDI and private investment, but public investment and external debt have no significant effect. In both regimes for investment, private investment is relatively more important than FDI in terms of contribution to total investment. Total (private) investment is higher under market-friendly regimes for investment, supporting the argument that good governance and institutions stimulate total (private) investment in less-developed countries.

Appendix B: The World Bank's governance indicators

According to Kaufman et al. (2005), the World Bank's governance indicators measure the following six dimensions of governance:

1. Voice and accountability – measuring the extent to which citizens of a country are able to participate in the selection of governments, and the independence of the media, which serves a significant role in monitoring those in authority and holding them accountable for their actions.

2. Political instability and violence – measuring perceptions of the likelihood that the government in power will be destabilized or overthrown by possibly unconstitutional and/or violent means, including domestic violence and terrorism.

3. Government effectiveness – focusing on inputs required for the government to be able to produce and implement good policies (the quality of the bureaucracy, the credibility of the government's commitment to policies, for example) and deliver public goods.

4. Regulatory quality – measuring the incidence of market-friendly policy in areas such as foreign trade and business development.

5. Rule of law – measuring the extent to which agents have confidence in and abide by the rules of society and the extent to which property rights are protected. These include perceptions of the incidence of crime, the effectiveness and predictability of the judiciary, and the enforceability of contracts.

6. Control of corruption – measuring the exercise of public power for private gain, including both grand corruption and state capture.

The indicators cover 209 countries and territories for 1996, 1998, 2000, 2002, and 2004. They are based on several hundred individual variables measuring perceptions of governance, drawn from 37 separate data sources constructed by 31 different organizations such as Freedom House, World Economic Forum, European Bank for Reconstruction and Development and so forth.

An unobserved components model – providing estimates of governance for each country and measures of the precision of these estimates for every country, indicator and year – is employed to construct the six aggregate governance indicators in each period. The governance estimates are normally distributed with a mean of zero and a standard deviation of one in each period. This implies that virtually all scores lie between –2.5 and 2.5, with higher scores corresponding to better outcomes (the World Bank also shows point estimates in percentile rank). Table B1 presents comparison for all six governance indicators across the 36 countries.

Table B1: Governance indicators for 36 developing countries

Country	Average percentile rank (1996-2002)					
	Voice and accountability	Political stability and absence of violence	Government effectiveness	Regulatory quality	Rule of law	Control of corruption
Argentina	61.4	54.7	62.4	62.8	54.3	46.0
Bolivia	55.7	41.8	40.2	72.1	34.9	29.9
Bulgaria	62.1	59.8	39.0	58.6	54.5	44.1
Chile	72.2	75.8	86.8	91.9	86.0	88.4
Costa Rica	87.7	84.8	71.7	79.4	75.6	81.5
Côte d'Ivoire	25.3	30.8	36.8	41.5	25.7	42.4
Croatia	49.3	62.2	62.6	57.0	52.5	51.0
Czech Republic	78.1	82.7	77.9	79.9	72.9	72.5
El Salvador	51.1	55.2	46.0	80.3	43.3	43.0
Estonia	73.5	78.4	77.6	88.0	71.8	72.8
Guatemala	35.9	20.5	34.9	63.1	25.5	27.0
Hungary	82.9	81.1	77.6	83.8	76.9	78.0
India	60.7	26.2	53.6	42.0	60.3	49.0
Indonesia	23.8	13.0	41.8	42.3	21.9	15.9
Iran, Islamic Republic	21.7	34.1	43.3	8.1	33.4	32.2
Jamaica	66.4	52.1	42.4	68.9	47.8	47.1
Kyrgyz Republic	29.5	52.0	33.2	32.7	24.4	23.1
Mauritius	76.3	88.5	75.0	67.4	78.7	73.5
Mexico	50.5	38.8	64.4	73.2	46.9	44.4
Moldova	46.5	44.8	26.7	36.1	43.4	32.7
Pakistan	19.1	16.9	31.6	27.4	31.3	20.1
Panama	64.3	61.8	49.9	80.5	59.5	45.5
Paraguay	35.7	28.6	11.6	39.3	22.3	14.4
Peru	39.3	24.9	51.5	73.3	38.2	55.9
Philippines	58.8	38.9	63.2	65.0	47.3	42.5
Poland	80.0	73.0	75.4	72.7	71.0	72.7
Romania	58.6	57.0	32.8	44.9	49.4	45.2
Senegal	45.6	23.4	55.7	38.9	50.0	43.4
Slovak Republic	68.4	74.6	66.1	64.9	63.7	67.0
South Africa	72.7	29.2	69.2	61.4	64.1	73.4
Sri Lanka	42.4	9.1	46.4	65.5	58.5	54.6
Thailand	55.7	57.8	66.7	67.0	67.4	48.0
Tunisia	25.6	61.9	79.4	59.6	65.0	68.8
Turkey	30.8	16.5	52.9	65.6	59.3	54.2
Uruguay	74.7	77.3	75.3	80.5	71.5	76.4
Venezuela, Republic	47.1	26.2	15.8	37.5	24.3	24.3

Source: World Bank – http://www.worldbank.org/wbi/governance/govdata/

Appendix C: Sample selection bias

The tables below present the proportions of our sample in high/low governance that are middle/low income countries as compared to respective proportions in population of countries with governance data. Compared to the population, middle income countries, specifically for 'high' governance countries, are over-represented in our sample, whereas low income countries are under-represented, especially for 'low' governance countries.

Voice and accountability

	Kaufman et al. (2005)		Sample	
	'High'	'Low'	'High'	'Low'
Middle income country	34.7%	30.7%	55.6%	30.6%
Low income country	5.3%	29.3%	2.8%	11%

Political stability and absence of violence

	Kaufman et al. (2005)		Sample	
	'High'	'Low'	'High'	'Low'
Middle income country	27.7%	35.8%	50%	36.1%
Low income country	3.4%	33.1%	2.8%	11.1%

Regulatory quality

	Kaufman et al. (2005)		Sample	
	'High'	'Low'	'High'	'Low'
Middle income country	28.9%	36.9%	66.7%	19.4%
Low income country	0.7%	33.5%	0%	13.9%

Control of corruption

	Kaufman et al. (2005)		Sample	
	'High'	'Low'	'High'	'Low'
Middle income country	24.2%	41.6%	41.7%	44.4%
Low income country	1.3%	32.9%	0%	13.9%