

Governance and FDI: disparities due to methodologies

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Abstract

The new institutional literature recognises the importance of political and institutional factors of governance as determinants of FDI. Globerman & Shapiro (2003), Adeoye (2009) and others find evidence of a positive correlation between better governance and FDI. Asiedu (2002), Kolstad & Villanger (2008) and others, however, do not find evidence of this relationship. Chakrabarti (2001) argues the conflicting results are due to differences in the methodologies across the numerous studies. This study complements the analysis of Chakrabarti using the World Bank Governance Indicators and data compiled by the United Nations Centre for Trade and development and the World Bank to create a panel data sample set of 155 countries over a 13 year period. The results of three different regression techniques popular in the empirical studies are compared to ascertain the disparity caused by different analytical tools. Evidence is found that “good governance” is positively related to FDI inflow at the aggregate level, however, the effect of governance varies depending on both the choice of estimator and the choice of governance indicator used. These results suggest that the empirical evidence available needs to be treated with caution.

Introduction

This paper centres on the role of governance as a determinant of foreign direct investment (FDI)¹ inflow. The literature exploring the determinants of FDI has become extensive; however, Globerman & Shapiro (2002) find that the empirical results are neither consistent nor conclusive. Although a large number of variables have been considered in the literature as possible determinants of inward FDI flow (FDI inflow), “surprisingly few” are consistently significant across studies (Globerman & Shapiro, 2002, p. 1905).

Recognising these disparities, this paper examines six World Bank Governance Indicators (WBGIs) using a dynamic panel model and both ordinary least squares (OLS) and general method of moments (GMM) regression analysis to provide a comparative exploration of these governance indicators on FDI inflow. The results of the regressions performed provide some evidence that improved governance is positively related to FDI inflow at the aggregate level, but more importantly, the results verify that the effect of governance varies depending on the choice of governance indicator and the choice of estimator used. Great care should therefore be taken when interpreting the results of these studies when attempting to understand the role of governance as a determinant of FDI.

¹ The United Nations Centre for Trade and Development (UNCTAD) World investment Report defines FDI “an investment involving a long-term relationship and reflecting a lasting interest and control [10% or more of voting stock] by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)...FDI has three components: equity capital, reinvested earnings and intra-company loans” (UNCTAD, 2009, p. 243). As Hymer (1960, p. 1) notes, however, “[c]ontrol is not an easy thing to define, and the dividing line between some control and no control is arbitrary”. For a comprehensive discussion on defining FDI see the OECD’s Benchmark Definition of Foreign Direct Investment (OECD, 1996; 2008), but as Caves (2007) states, “[e]xact definitions are unimportant ... because economic analysis emphasizes that at definitional margins decision-makers face close trade-offs rather than bimodal choices” (p. 1). De Mello (1999, p. 135) explains that “FDI is conventionally defined as a form of international inter-firm co-operation that involves significant equity stake and effective management decision power in, or ownership control of, foreign enterprises. FDI is also considered to encompass other broader, heterogeneous non-equity forms of co-operation that involve the supply of tangible and intangible assets by a foreign enterprise to a domestic firm. Those broader collaborative associations include most types of quasi-investment arrangements, such as licensing, leasing, and franchising; start-up and international production sharing arrangements; joint ventures with limited foreign equity participation; and broad R&D co-operation”.

Literature Review

The contemporary focus on FDI is as a channel for improving general welfare by facilitating economic growth and development. Numerous empirical studies have explored the determinants of FDI from a traditionally neo-classical growth and trade perspective, some examples of which are summarised in table 1² below. These determinants include: measures of persistence in the levels of FDI; scale factors such as market size, economic growth, GDP per capita, industry concentration, and economies of scale or scope; availability and pricing of natural resources; policy and institutional factors including openness and trade policy, monetary and fiscal policies, political stability, infrastructure, financial depth, and risk. This list is by no means exhaustive and not all the variables listed are used simultaneously in any analysis. Issues of collinearity and endogeneity prevent all the listed variables from being used simultaneously in regression analysis. Although this introduces the possibility of omitted variable bias, Naudé & Krugell (2007) argue that in practice a choice has to be made about which variables to use in a regression analysis and this choice is often influenced by the availability of data. Although a large number of determinants have been explored in the literature, Globerman & Shapiro (2002) find that few of these variables are consistently significant across the empirical studies that have been performed. The only variables they find to be consistently significant are measures of real GDP.

Table 1 supports the findings of Globerman & Shapiro (2002) showing that FDI and GDP are positively³ correlated whereas the relationship between FDI and other potential explanatory variables is inconsistent. It also highlights the point made by Chakrabarti (2001, p. 89) who argues that the conflicting results “can be explained, to some extent, in terms of the wide differences in perspectives, methodologies, sample-selection and analytical tools” used. Chakrabarti (2001, p. 90) recognises that there is a heterogeneity in approach and a lack of consensus on a theoretical framework to guide empirical work on FDI resulting in a diverse and “unwieldy” literature.

² Table 1 presents a summary of selected studies over the past 25 years for the period 1985 – 2009 (governance variables are highlighted in bold).

³ The studies that use FDI adjusted for GDP as the dependent variable tend to find no significant relationship between the adjusted FDI variable and the GDP variable as would be expected.

Table 1: Findings of selected studies relating to frequently tested determinants of FDI (1985-2009)

Year	Author	Area of Focus	Regr. Techn.	Period	No. of Countries	Dependant Variable	Findings Relating to Frequently Tested Determinants [#]		
							Significant (+ive)	Significant (-ive)	No significance / Inconclusive
2009	Adeoye	Emerging Markets	GLS _{RE}	1997-2002	33	FDI inflow / GDP	Governance (WBGI composite); Openness		GDP / capita; Inflation; Literacy rate; No. of telephone lines; Household expenditure
2008	Kolstad & Villanger	Service Industries	OLS _{FE}	1989-2000	57	FDI inflow / cap.	GDP / capita; Institutional quality; Democracy		Growth; Political risk index; Trade; Inflation
2007	Naudé & Krugell	Africa	GMM	1970-1990	44	FDI inflow / GDP	Growth; Governance (certain WBGIs); Government expenditure; Initial literacy	Governance (certain WBGIs); Inflation rate	Geography
2006	Fedderke & Romm	South Africa	VEC	1962-1996	1	FDI instock	GDP; Property rights; Exports	Political instability; Imports; Capital / labour; Wage; Tax	
2005	Neumayer & Spess	Developing countries	OLS _{FE}	1984-2001	91	FDI inflow / GDP	GDP / capita; Growth; Institutional quality; Resource intensity	Inflation rate; Population	World Trade Organisation (WTO) membership
2004	Carstensen & Toubal	CEECs*	GMM	1993-1999	10	FDI inflow	Market potential; Skill ratio; Political risk index		
2003	Globerman & Shapiro	Cross-country sample	OLS	1995-1997	88	US based FDI inflow	GDP; Governance (WBGI composite); Proximity to the US; Fixed (US\$) exchange rate		Exchange rate
2002	Asiedu	Developing countries	OLS	1988-1997 (ave)	71	Net FDI flow / GDP	Openness; Infrastructure development; Return on investment	Sub-Saharan Africa	Growth; Political instability; Inflation rate; M2
2001	Chakrabarti	Cross-country sample	EBA	1994	135	Net FDI / capita	GDP / capita		Growth; Openness; Tax; Wage; Exchange rate; Tariffs on imports
2000	Resmini	CEEC Manuf. sectors	OLS _{FE}	1991-1995	10	FDI inflow	GDP / capita; Operational Risk; Population; Wage differentials		Openness; Size of manuf. sector
1995	Singh & Jun	Developing countries	OLS	1970-1993	31	FDI inflow / GDP	Political risk index; Exports; Business conditions index	Work Days lost	GDP / capita; Growth; Exchange rate; Int. transactions taxes
1985	Schneider & Frey	Developing countries	OLS	1976,79,80	54	Net FDI / capita	GNP / capita; Growth	Political instability; Inflation; BOP deficit; Wages;	Gov. ideology; Skills

* Central and Eastern European countries

Governance variables are highlighted in bold

The table also shows that there is a lack of uniformity concerning the governance measures used. The measures of governance used differ across studies and have varying impacts. An in-depth critique of the governance measures available is beyond the scope of this study but can be found in Arndt & Oman (2006). In summary they find that the indicators available lack transparency and comparability over time; suffer from selection bias; and are not well suited towards identifying how to improve the quality of governance (Arndt & Oman, 2006, p. 11). Another concern raised specific to their use in regression analysis relates to both the level and accuracy of the variance captured by the various indicators. Arndt & Oman (2006, p. 49) also find that although numerous problems plague the use of governance indicators, in general the WBGIs are the most carefully constructed and most widely used.

Despite these issues, the theory based literature has recognised the importance of political and institutional factors of governance as potential determinants of FDI. This has been inspired to a large extent by the New Institutional literature of which North (1990) and Olson (1993) are seminal contributors (Bénassy-Quéré, Coupet, & Mayer, 2005, p. 8). The theory suggests that governance and the institutions of governance are expected to influence the underlying the FDI decision. When comparing conditions for investment in autocracies and democracies, Olson (1993) argues that secure property rights underlie economic growth in democracies and improve the conditions for investment. O'Donnell (1978), on the other hand, illustrates how highly autocratic states can attract foreign investment through lucrative investor-state collusions. These disparate theories suggest that different aspects of governance may be expected to have differing effects on FDI.

Theoretical Framework and Methodology

This paper uses both ordinary least squares (OLS) and general method of moments (GMM) regression analysis to provide a comparative examination of governance on FDI inflow.

The econometric model

The Darwinian tradition of neo-classical economics assumes that the firm acts in the interests of its stakeholders with its principal objective being to advance its long-term profitability

(Caves, 2007). The objective function of a firm wishing to maximise profits (π) may be expressed as

(i)

where TR is the total revenue generated by the firm, and TC is the total cost incurred by the firm in generating the revenue. Assuming the firm is operating over more than one period, as a going concern, the firm's objective function becomes one of maximising the net present value (NPV) of the expected profits (π^e) accruing to the firm over the lifetime (N) of the investment. Given a lifetime of N-periods, future profits are discounted back by an appropriate discount rate (r) and the NPV can be calculated as

(ii)

A firm producing outside of national boundaries is seen within the context of the long term pursuit of profit. The likelihood of a firm entering, or expanding into a foreign country can therefore be written as a function (θ_1) of the NPV to be generated from the investment such that

(iii)

In practice this relationship is not observable. What can be observed and measured is the value of FDI inflow invested in a country post hoc, as well as various country specific factors. Equation (iii) can therefore be re-specified, such that the value of FDI inflow is written as a function (θ_2) of the host country characteristics that are expected to influence the profitability of a firm's investment decision such that

(iv)

X_1 is a vector of variables expected to be positively related to profits and hence FDI inflow, and the X_2 variables are those expected to be negatively correlated with FDI inflow.

Adapting equation (iv) to an econometric form yields the estimating equation

(v)

where y_{it} is the FDI_{adj} dependant variable for country i in period t ; x_{it} is a vector of explanatory variables⁴; and ϵ_{it} is a standard error term. Equation (v) is the form of the OLS regression model used. OLS regressions are expected to suffer from bias given the nature of the data so panel analysis is used to address the potential estimation bias caused by the

⁴ A list of the explanatory variables used is found in table 3 above.

heterogeneity and multicollinearity issues that are likely to arise. Given the heterogeneity present in the data set and the likely correlation problems due to the inclusion of a lagged dependent variable needed to account for the significant hysteresis, a dynamic panel GMM model is expected to yield the most efficient (best) unbiased and consistent estimates.

Adapting equation (v) to a dynamic model and making provision for unobserved heterogeneity yields the equation

(vi)

where y_{it-1} is the first lag of the FDI_{adj} dependant variable for country i in period t ; v_i are the unobserved country-specific and time-invariant (fixed) effects; and μ_{it} is a standard error term. Writing equation (vi) in first differences form yields

(vii)

Equation (vii) eliminates the unobserved heterogeneity but introduces potential correlation bias. For this reason the equation (vii) is estimated using the Arellano-Bond GMM estimator which uses instrumental variables (IVs) that are both correlated with $\Delta y_{i,t-1}$ and uncorrelated with $\Delta \mu_{it}$. The lag of the dependant variable (Lag FDI_{adj}) is used as an instrument for the $\Delta y_{i,t-1}$ term.

The dependent variable: Adjusted FDI (FDI_{adj})

The dependent variable is the natural logarithm⁵ of the ratio of FDI inflow to GDP (FDI_{adj}). The FDI_{adj} measure is a proportional measure of FDI enabling more meaningful comparability across time and countries. It also negates issues caused by the ambiguity regarding the direction of causality between the FDI inflow and GDP variables. Empirical results find that the two are positively related and theory suggests that increased FDI promotes economic growth. However, growth may promote FDI or the two may positively reinforce one another. Removing this ambiguity removes statistical issues of reverse causality arising.

⁵ For those few instances where FDI inflow is zero, it is set to a positive value of 0.1. The natural logarithm of zero is undefined and therefore needs to be changed to 0.1 to avoid the loss of the data point. This amounts to 22 changes (of 1085 observations). The benefits of these changes are expected to outweigh the accuracy losses as they ensure the panel is balanced and increase the number of useable observations.

The test variables: The World Bank Governance Indicators (WBGIs)

Improvements in governance are expected to lead to increased FDI, however, there is an issue concerning what constitutes “governance” or indeed “good governance”. The measure of governance used in this study is the set of six WBGIs. The authors of the WBGIs define governance as “the traditions and institutions by which authority in a country is exercised” and an increase in the governance score is deemed to represent an improvement in governance (Kaufmann, Kraay, & Mastruzzi, 2009, p. 5) (KKM). The governance scores range from -2.5 to +2.5. It is noted that arguing the merits of this representation of improved governance is beyond the scope of this study, however, an in-depth critique is found in Arndt & Oman (2006). Arndt & Oman note that, although numerous problems⁶ plague the use of governance indicators, in general the WBGIs are the most carefully constructed and most widely used (2006, p. 49). The WBI set is therefore considered to be the most appropriate for the purposes of this study. The six WBGIs are: voice and accountability; political stability and absence of violence; government effectiveness; regulatory quality; rule of law; and control of corruption⁷. Composite measures of the indicators are also constructed using principal component analysis (PCA)⁸.

The control variables

The firm’s decision to invest in a foreign market is argued to be driven by higher expected long-term profitability as compared to alternative investment possibilities at home or in other host countries. The success of these investments depends on both economic and political influences and so it is necessary to consider both in the analysis (Schneider & Frey, 1985). Many potential determinants have been identified but issues of collinearity, endogeneity and data availability prevent all these variables being used simultaneously in a regression

⁶ There are two particular points of concern regarding these indicators. The first is that they are subject to potentially significant measurement errors, and the second is that they are highly correlated to one another as shown in the descriptive statistics, table 5. In response to the first issue, KKM suggest taking into account the margins of error that are published with each of the indicators if making comparisons across countries over time. This suggestion, however, is not practical for the purposes of this study due to the number of countries involved. It therefore remains a caveat that has to be kept in mind during the analysis. To overcome the second issue, Globerman & Shapiro (2002; 2003) construct a composite measure of all the indicators which they use in their analysis. KKM specifically advise against doing this due to the method used to construct the individual indicators. This composite measure is also criticised by Arndt & Oman (2006). Nevertheless a composite measure is created here for the purposes of comparison with other studies but its lack of credibility is reiterated in the results section that follows.

⁷ Further information about these variables is given in table 3 above.

⁸ The three principle components constructed account for 95% of the variance of the WBGIs. The first principal component (PC1) accounts for approximately 85% of the variance. The second principal component (PC2) accounts for approximately 7% of the variance. The third principal component (PC3) accounts for approximately 3% of the variance.

analysis. The control variables⁹ included in the model are intended to capture broad economic and political influences and proxy for other aspects of macro-level policy. The four control variables included in the model are lagged FDI_{adj} , openness, government expenditure and inflation¹⁰.

The lagged FDI_{adj} variable accounts for the dynamic nature¹¹ of the FDI variable and is expected to be positive and significant across all regressions. The openness variable provides an indication of how receptive a host country is to FDI. It also provides an indication of how globally integrated a country is and serves to account for trade policy effects. Absence of trade barriers is generally expected to facilitate FDI inflow and the coefficient of this variable is therefore expected to be positive. The government expenditure measure is included to account for fiscal policy actions which can either be accommodative or crowd out FDI. It is likely to be accommodative when expenditure is undertaken in conjunction with FDI partners, particularly in countries without sophisticated market mechanisms. It is likely to crowd out FDI in countries where market mechanisms and open trade policies enable efficient private delivery of goods and services. The expected coefficient of this variable is therefore uncertain. The inflation variable serves as a proxy for monetary policy and stability and is expected to be negatively related to general economic activity including FDI. The coefficient of this variable is therefore expected to be negative.

⁹ There are nine instances of missing data points, in which case the average of the post and preceding values is assigned to the missing data value. Including these observations as opposed to dropping them provides more general variability and the net benefit of including them despite these adjustments is expected to outweigh any net benefit of not including them.

¹⁰ Further information about these variables is given in tables 2 and 3 below.

¹¹ See table 4 in the descriptive statistics.

Descriptive Statistics

The variables used and the source of data are displayed in table 2 below.

Table 2: Details of the variables used in the analysis

Variables	Labels	Details	Data Source
Dependent variable			UNCTAD*
Ln(Inward FDI flow / GDP)	FDI _{adj}	The net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise, adjusted for the level of GDP	
Test variables (WBGIs)			World Bank[#]
<i>Type 1:</i>		<i>Accounting for the process by which governments are selected, monitored and replaced</i>	
Voice & Accountability	V & Acc	Perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media	
Political Stability & Absence of Violence	Pol stab	Perceptions of the likelihood that the government will be destabilised or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism	
<i>Type 2:</i>		<i>Accounting for the capacity of the government to effectively formulate and implement sound policies</i>	
Government Effectiveness	Gov eff	Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	
Regulatory Quality	Reg qual	Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	
<i>Type 3:</i>		<i>Accounting for the respect of citizens and the state for the institutions that govern economic and social interactions among them</i>	
Rule of Law	Law	Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	
Control of Corruption	Corrup	Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests	
PCA composite variables	PC1; PC2; PC3	Variables constructed using principal component analysis (PCA), a statistical technique that transforms correlated variables into a smaller number of uncorrelated variables called principal components (PCs). The three principle components constructed account for 95% of the variance of the WBGIs	
Control variables			UNCTAD*
Lagged FDI	Lag FDI _{adj}	The value of FDI _{adj} corresponding to the previous time period	
Ln((Exports + Imports) / GDP)	Openness	The value of all goods and other market services received from the rest of the world (imports of G&S) and provided to the rest of the world (exports of G&S) as a percentage of GDP; also referred to as trade openness	
Ln(Gov. expenditure / GDP)	Gov exp _{adj}	All government current expenditures for purchases of goods and services (including compensation of employees and excluding government military expenditures that are part of government capital formation), adjusted for the level of GDP	
Ln(Annual inflation)	Inflation	The rate of price change in an economy as a whole	

* Source: unctadstat.unctad.org

[#] Source: data.worldbank.org

The natural logarithm of the variables is taken to reduce the skewness of the distribution and reduce the severity of outliers¹². The data set contains information on 155 countries over a 13 year period from 1996 to 2009. The period begins in 1996 as this is when the WBGI's were first compiled. The WBGI's were initially compiled every two years (for the years 1996, 1998, 2000 and 2002) and later every year (from 2004 until present). In order to include both these periods in the investigation only biannual data is used in the analysis (ie: year 1 = 1996; year 2 = 1998; etc for a total of seven periods and 1085 observations). There are therefore five panel periods (excluding the first difference and lag years) for a total of 775 observations. The full list of countries included is found in appendix 1: table 8. The means and standard deviations of the variables are found in table 3 below.

Table 3: Selected descriptive statistics of the variables used

Variable	No. of Obs.	Mean	Std. Dev.	Min	Max
FDI _{adj}	1085	-3.74	1.47	-10.32	-0.10
Openness	1085	-0.23	0.52	-1.90	1.52
Gov Exp _{adj}	1085	-1.91	0.40	-3.96	-0.77
Inflation	1085	1.66	1.23	-4.62	8.59
V & Acc	1085	0.00	0.93	-2.06	1.83
Pol stab	1085	-0.03	0.92	-2.61	1.65
Gov eff	1085	0.06	0.96	-1.88	2.64
Reg qual	1085	0.10	0.89	-2.67	3.41
Law	1085	0.01	0.95	-1.88	2.09
Corrup	1085	0.04	0.98	-1.76	2.56
PC 1	1085	0.00	2.25	-4.68	5.03
PC 2	1085	0.00	0.61	-2.27	1.98
PC 3	1085	0.00	0.55	-2.11	1.09

Plotting FDI inflow against GDP reveals a visually noticeable linear relationship as shown in figure 1 below and as suggested by the correlation coefficient of 0.825 in table 4 (figure in bold).

¹² See appendix 2: figures 3 and 4.

Figure 1: Log(FDI inflow) plotted against log(GDP)

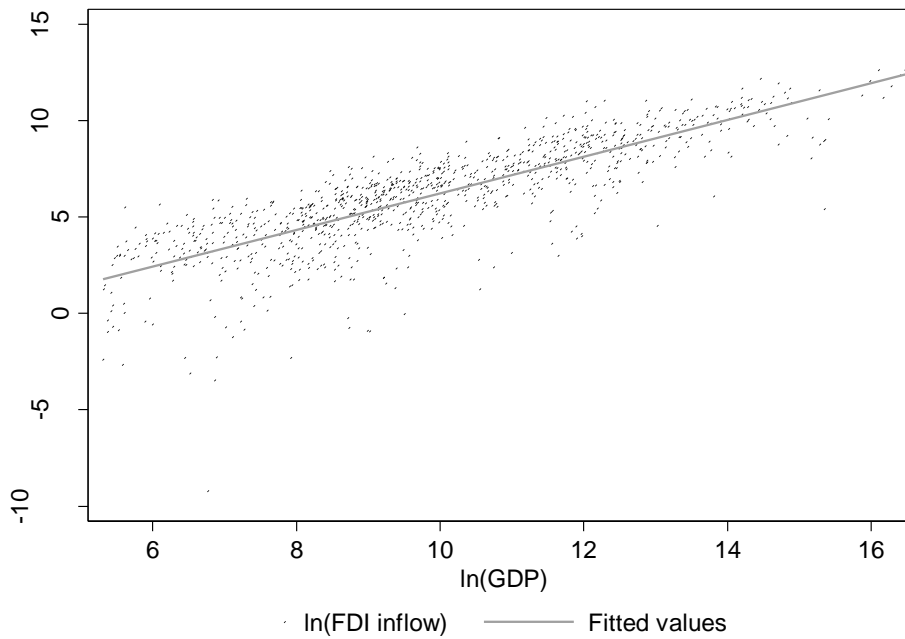


Table 4: The correlation coefficients of the FDI and GDP measures

		I	II	III	IV
ln(FDI inflow)	(I)	1			
ln(GDP)	(II)	0.825 0.000	1		
FDI _{adj} ¹³	(III)	0.503 0.000	-0.074 0.015	1	
Lag FDI _{adj}	(IV)	0.305 0.000	-0.055 0.092	0.647 0.000	1

This corresponds to the findings of Globerman & Shapiro (2002) and others. Adjusting FDI inflow for the level of GDP to create the FDI_{adj} dependent variable effectively eliminates¹⁴ the correlation between the dependent variable and GDP as suggested by the coefficient of -0.07. This corresponds to the findings of Singh & Jun (1995) and others preventing ambiguity arising from issues of reverse causality. The correlation coefficient between FDI_{adj} and lagged FDI_{adj} is 0.647 (figure in bold) indicating that significant hysteresis is prevalent in the dependent variable.

¹³ FDI_{adj} = ln(FDI inflow/GDP)

¹⁴ The relationship is shown graphically in appendix 2: figure 2.

Table 5 below shows the correlation amongst the variables used in the analysis. There are significantly high levels of correlation amongst the various WBGI (figures in bold) with the lowest correlation coefficient of 0.674 and the highest of 0.945. The first principal component (PC1) is highly correlated across all of the WBGI (figures underlined) whereas neither the second nor the third principal components offer similar levels of correlation. The lagged FDI_{adj} and government expenditure variables are significantly correlated with the openness variable and all of the WBGI are significantly correlated with the control variables. This suggests that a standard OLS regression is likely to suffer from multicollinearity bias. The openness variable is significantly positively related to the FDI_{adj} variable but neither the government expenditure nor the inflation variables are significantly correlated with FDI_{adj} . Government expenditure and the WBGI are significantly negatively correlated with the inflation variable. All the WBGI have a high negative correlation with the inflation variable suggesting that those countries with high inflation suffer lower governance scores. As shown, the principle component variables are uncorrelated (by construction).

Table 5: The correlation coefficients of the variables used in the analysis

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV
FDI_{adj} (I)	1													
Lag FDI_{adj} (II)	0.657 0.000	1												
Openness (III)	0.433 0.000	0.429 0.000	1											
Gov Exp _{adj} (IV)	0.020 0.513	0.004 0.915	0.174 0.000	1										
Inflation (V)	-0.031 0.315	0.009 0.777	0.008 0.788	-0.201 0.000	1									
V & Acc (VI)	0.159 0.000	0.166 0.000	0.092 0.003	0.349 0.000	-0.368 0.000	1								
Pol stab (VII)	0.225 0.000	0.254 0.000	0.350 0.000	0.363 0.000	-0.357 0.000	0.692	1							
Gov eff (VIII)	0.147 0.000	0.174 0.000	0.178 0.000	0.343 0.000	-0.400 0.000	0.775	0.726	1						
Reg qual (IX)	0.195 0.000	0.203 0.000	0.182 0.000	0.307 0.000	-0.401 0.000	0.775	0.674	0.908	1					
Law (X)	0.124 0.000	0.138 0.000	0.196 0.000	0.409 0.000	-0.421 0.000	0.785	0.795	0.941	0.872	1				
Corrup (XI)	0.107 0.000	0.127 0.000	0.158 0.000	0.393 0.000	-0.417 0.000	0.761	0.739	0.931	0.849	0.945	1			
PC 1 (XII)	0.171 0.000	0.189 0.000	0.207 0.000	0.392 0.000	-0.429 0.000	<u>0.866</u>	<u>0.834</u>	<u>0.962</u>	<u>0.924</u>	<u>0.971</u>	<u>0.951</u>	1		
PC 2 (XIII)	0.122 0.000	0.142 0.000	0.262 0.000	0.092 0.003	0.001 0.974	0.060 0.047	0.532 0.000	-0.166 0.000	-0.227 0.000	-0.029 0.340	-0.104 0.001	0 1	1	
PC 3 (XIV)	0.040 0.184	0.018 0.591	-0.182 0.000	-0.013 0.676	0.006 0.849	0.491 0.000	-0.112 0.000	-0.101 9E-04	0.025 0.419	-0.124 0.000	-0.145 0.000	0 1	0 1	1

Empirical Results and Analysis

Table 8 below shows the results of the OLS and GMM regressions performed for comparison with the findings of previous studies.

Table 6: Comparative OLS and GMM regression output using the full data sample

VARIABLES	Regression output			
	OLS		OLS ^{FE}	GMM 1
	1	2		
Lag FDI _{adj}	0.660*** (0.027)	0.584*** (0.053)	0.0760* (0.0405)	0.262*** (0.052)
Openness		0.457*** (0.084)	0.871*** (0.294)	1.275*** (0.356)
Inflation		-0.018 (0.039)	-0.00376 (0.0456)	-0.031 (0.046)
Gov Exp _{adj}		-0.140 (0.106)	-0.740*** (0.257)	-0.157 (0.293)
PC1		0.018 (0.022)	0.220* (0.117)	0.446*** (0.144)
PC2		0.042 (0.064)	-0.258 (0.159)	-0.360* (0.186)
PC3		0.088 (0.065)	-0.168 (0.221)	0.164 (0.253)
Observations	775	775	775	775
No. of countries	155	155	155	155
R-squared	0.451	0.474	0.100	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

OLS 1 regresses FDI_{adj} against its lagged value. The lagged variable is significant at the 1% level and the model R² is 45%, illustrating the high levels of persistence which make endogeneity a likely problem in OLS regressions that include additional explanatory variables. The OLS 2 regression uses all the explanatory variables in a standard OLS regression. The governance variables are not significant in this regression and the model R² hardly changes from OLS 1 despite the inclusion of at least one other highly significant variable¹⁵. In the OLS^{FE} regression the PC1 composite governance measure is only significant at the 10% level¹⁶, in contrast the PC1 measure is significant at the 1% level in the GMM 1 regression¹⁷. As shown the governance results differ across the three estimators

¹⁵ An OLS estimator is not, however, expected to provide the best estimates given the nature of the data.

¹⁶ The lagged FDI_{adj} variable is also only significant at the 10% level, however, and the model R² is only 10%.

¹⁷ The Wald chi-squared test indicates that the model provides a good fit.

used. As discussed in the methodology, the GMM estimator is expected to provide the best estimates, however, KKM specifically advises against using a WBI composite measure. Each of the WBIs are therefore also tested individually and the results are shown in table 9 below.

Table 7: GMM regression results using the full sample

VARIABLES	GMM regressions							
	1	2	3	4	5	6	7	8
Lag FDI _{adj}	0.262*** (0.052)	0.262*** (0.053)	0.261*** (0.053)	0.260*** (0.053)	0.265*** (0.052)	0.249*** (0.052)	0.266*** (0.053)	0.261*** (0.053)
Openness	1.275*** (0.356)	1.265*** (0.356)	1.260*** (0.358)	1.266*** (0.358)	1.250*** (0.357)	1.296*** (0.354)	1.276*** (0.358)	1.270*** (0.358)
Inflation	-0.031 (0.046)	-0.031 (0.046)	-0.031 (0.046)	-0.030 (0.046)	-0.035 (0.046)	-0.027 (0.046)	-0.026 (0.046)	-0.030 (0.046)
Gov Exp _{adj}	-0.157 (0.293)	-0.202 (0.292)	-0.082 (0.293)	-0.043 (0.292)	-0.103 (0.291)	-0.114 (0.288)	-0.071 (0.292)	-0.031 (0.292)
PC1	0.446*** (0.144)							
PC2	-0.360* (0.186)							
PC3	0.164 (0.253)							
V & Acc		0.268 (0.260)	0.389 (0.249)					
Pol Stab		-0.204 (0.180)		0.009 (0.161)				
Gov Eff		0.577* (0.312)			0.773*** (0.263)			
Reg Qual		0.430 (0.275)				0.645*** (0.232)		
Law		0.347 (0.371)					0.586** (0.295)	
Corrup		-0.293 (0.300)						0.183 (0.256)
Observations	775	775	775	775	775	775	775	775
No. of countries	155	155	155	155	155	155	155	155

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In contrast to a highly significant PC1 aggregate governance variable resulting from GMM 1, when the WBIs are all regressed simultaneously is the case in GMM 2, only the

government effectiveness indicator is significant and only at the 10% significance level¹⁸. When regressing each of the WBGIs separately (GMM 3-8) government effectiveness and regulatory quality are each found to be significant at the 1% level, while only law is significant at the 5% level. These results provide evidence that certain aspects of “improved governance” may be positively related to FDI inflow at the aggregate level. But the results also suggest that not all aspects of governance are equally important, or that the governance measure chosen materially affects the results. The finding of a positive significant composite variable (PC1) is in line with the findings of Adeoye (2009) and Globerman & Shapiro (2002). The finding of an insignificant political stability indicator corresponds to the findings of Asiedu (2002) but is in contrast to the findings of Carstensen & Toubal (2004), Fedderke & Romm (2006) and Schneider & Frey (1985). The finding of a positive significant regulatory quality indicator corresponds to the findings of Neumayer & Spess (2005) and Kolstad & Villanger (2008).

These results confirm the research of Chakrabarti (2001) who suggests that it is the differences in approach and measures used that has led to the inconsistent results and an “unwieldy” literature.

Conclusions

The new institutional literature recognises the importance of political and institutional factors of governance as determinants of FDI, however, differences in both the approach and governance measure used in empirical studies has resulted in inconsistent findings. A few popular statistical estimators have been used to analyse an extensive aggregate (macro) level data set and the results reveal that both the choice of estimator and governance indicator have a material effect on the outcome of the regressions performed. The erratic findings coupled with the concerns that accompany the construction of governance measures suggest that results derived from a macro-level analysis need to be treated with care. A potential measure for improving the insight sought by studies of this nature could be to conduct further studies that focus on micro-level data. This is a topic for further research.

¹⁸ This may be due to the high levels of collinearity amongst the WBGIs.

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Appendix

Appendix 1: Lists of countries

Table 8: Alphabetically ordered list of all countries included in the analysis

Albania	Dominica	Kuwait	Rwanda
Algeria	Dominican Rep.	Kyrgyz Rep.	Samoa
Angola	Ecuador	Latvia	Saudi Arabia
Antigua & Barbuda	Egypt, Arab Rep.	Lebanon	Senegal
Argentina	El Salvador	Lesotho	Seychelles
Armenia	Equatorial Guinea	Lithuania	Sierra Leone
Australia	Estonia	Macao (China)	Singapore
Austria	Ethiopia	Macedonia, FYR	Slovak Rep.
Azerbaijan	Fiji	Madagascar	Slovenia
Bahamas, The	Finland	Malawi	South Africa
Bahrain	France	Malaysia	Spain
Bangladesh	Gabon	Maldives	Sri Lanka
Belarus	Gambia, The	Mali	St. Lucia
Belize	Georgia	Malta	St. Vincent & Grenadines
Benin	Germany	Mauritania	Sudan
Bolivia	Ghana	Mauritius	Suriname
Bosnia & Herzegovina	Greece	Mexico	Swaziland
Botswana	Grenada	Moldova	Sweden
Brazil	Guatemala	Mongolia	Switzerland
Brunei Darussalam	Guinea	Morocco	Syrian Arab Rep.
Bulgaria	Guinea Bissau	Mozambique	Tajikistan
Burkina Faso	Guyana	Namibia	Tanzania
Burundi	Haiti	Nepal	Thailand
Cambodia	Honduras	Netherlands	Togo
Cameroon	Hong Kong (China)	New Zealand	Trinidad & Tobago
Canada	Hungary	Niger	Tunisia
Cape Verde	Iceland	Nigeria	Turkey
Central African Rep.	India	Norway	Turkmenistan
Chile	Indonesia	Oman	Uganda
China	Iran, Islamic Rep.	Pakistan	Ukraine
Colombia	Ireland	Panama	United Arab Emirates
Comoros	Israel	Papua New Guinea	United Kingdom
Congo, Rep.	Italy	Paraguay	United States
Costa Rica	Jamaica	Peru	Uruguay
Cote d'Ivoire	Japan	Philippines	Vanuatu
Croatia	Jordan	Poland	Vietnam
Cyprus	Kazakhstan	Portugal	Yemen, Rep.
Czech Rep.	Kenya	Romania	Zambia
Denmark	Korea, Rep.	Russian Federation	

Appendix 2: FDI graphs

Figure 2: Adjusted FDI (FDI_{adj}) plotted against GDP

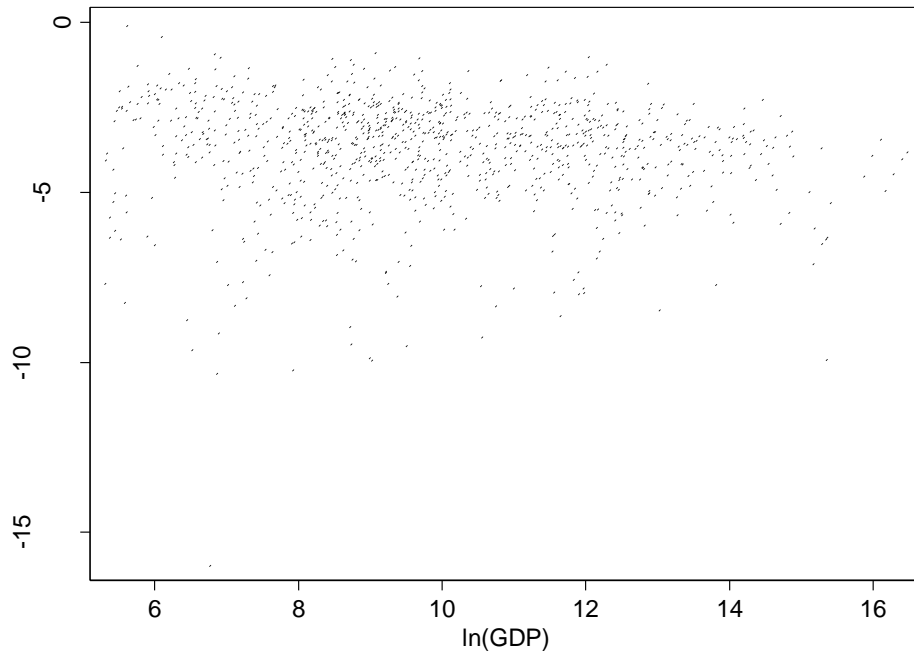


Figure 3: Histogram of FDI inflow / GDP

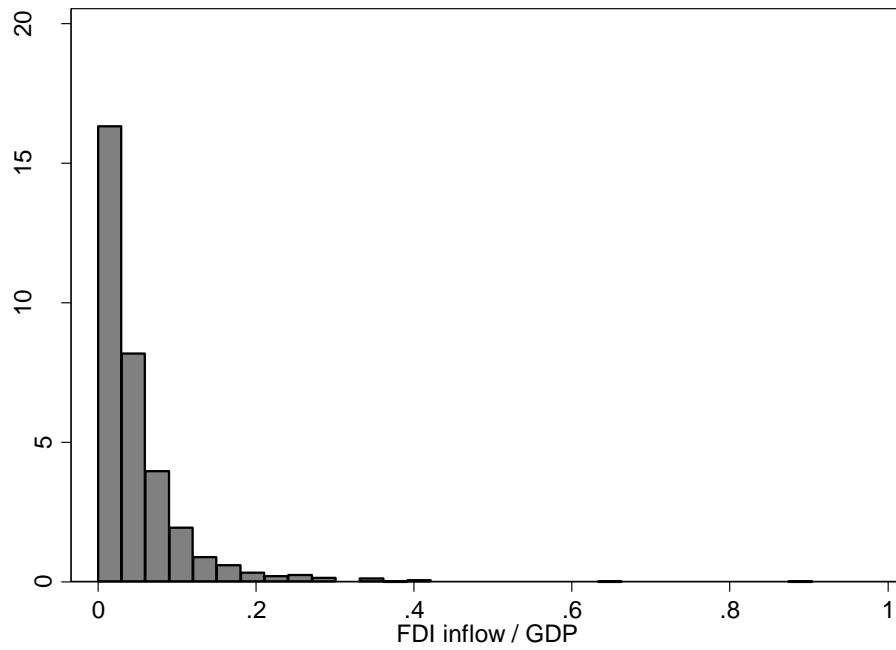


Figure 4: Histogram of FDI_{adj}

