Institutions and FDI: Impact Analysis by Countries' Income Level

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Abstract: *This paper scrutinises the relationship between foreign direct investment (FDI) and institutional quality using panel data for 44 high-, 39 upper middle-, 23 low- and 35 lower middle-income countries over the period 2000 to 2017. We revisit the relationship by using a composite institutional index of World Governance Indicators (WGI), constructed using principal component analysis (PCA). Further, we extend the analysis to estimate the impact of the different dimensions of WGI indicators on FDI flows, using the generalised methods of moments (GMM). Our empirical findings for developed countries suggest that the institutional index is a robust determinant of FDI inflows in high income countries, whereas it is not significant in upper-middle income countries. Dimensions, such as rule of law, regulatory quality and control of corruption are key determinants of FDI flows to high-income countries, whereas none of the dimensions is significant in upper middle-income countries. Findings for developing countries, specifically lower middle-income countries, indicate that the overall index as well as individual dimensions are insignificant because of the poor quality of institutional framework. Ceteris paribus, politically stable economies endowed with an efficient and a credible government and strong regulatory framework tend to attract FDI flows into low-income countries.*

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Introduction

Most developed and developing regions of the world have established strategies to attract capital flows, namely foreign direct investment (FDI). Since the 1990s, the importance of FDI net inflows was obvious, as it kept increasing between and within developed and developing countries. They rose from US$239.4 billion in 1990 to reach a peak amount of around US$3.13 trillion in 2007.

Amid the severe global financial crisis that hit the world in 2008, stock markets, consumer confidence, real estate values and world trade fell sharply. While the financial system started to stabilise again, a major crisis erupted with the collapse of a giant financial institution of the United States (US) market, Lehman Brothers, followed by the collapse of several other financial firms. Due to the impact of the ongoing crisis, global FDI fell by 21% in 2008 and a further 41.5% in 2009, that is, a decline of 53.8% between 2007 and 2009. The decline caused by the turmoil in the global economy differed across economic groups. In developed countries, where the crisis originated, FDI flows fell by 16.5% between 2007 and 2008, while FDI flows to developing countries increased by 10.4% in the same period.[1] Despite the global financial crisis, global FDI climbed back to pre-crisis levels, reaching US$2.36 trillion in 2011, that is, 7.36% more in 2011 than in 2006. Nevertheless, the world is experiencing a downward trend, with US$1.09 trillion in 2018, or 65% less than in 2007.

Along with economic vulnerabilities, the aftermath of the financial crisis brought back the debate on the institutional framework of the US and international economies, their regulatory frameworks and government supervisory policies. Numerous reforms in institutional policies and legislations, economic partnership agreements, and privatisation programmes have been undertaken to attract FDI inflows.

There is a plethora of empirical studies examining the effect of institutions and FDI on economic growth. Nevertheless, the number of studies examining the direct nexus between FDI and institutions is scant and remains poorly studied. The link between the two was first brought up through an indirect study of the link between FDI and economic growth by Douglass North. The nexus was then scrutinised by Daude and Stein (2007), Jude and Levieuge (2017), Peres et al. (2018), and Sabir et al. (2019), who found that better institutions increase FDI inflows and poor institutions

impede FDI inflows (Buchanan et al., 2012).

Although the impact of institutions on FDI has garnered increasing attention of late, only a few studies approach the relationship in a sample of developed and developing countries classified by income level. Our sample comprises 58 developing countries and 83 developed countries. Specifically, 23 are low-income (LI) countries, 35 are lower middle-income (LMI) countries, 44 are high-income (HI) countries and 39 are upper middle-income (UMI) countries. Also, the originality of our paper lies in the two-way analysis approach. The first consists of the construction of a composite index representing the different dimensions of World Governance Indicators (WGI) by employing the principal component analysis (PCA) technique. The second lies in the analysis of the impact of each institutional dimension on FDI inflows to different income groups. Our paper attempts to answer the following research questions: What is the impact of institutions on FDI inflows to developed and developing countries? How robust are institutions as a determinant of FDI to developing and developed countries?

The remainder of this paper is organised as follows. Section 2 presents the theoretical and empirical review of the study. Section 3 describes the model, methodology and the dataset. Section 4 discusses the main empirical results. Section 5 provides the conclusion and policy implications.

2.   Literature Review

2.1   *Theoretical framework*

The decision of multinational enterprises (MNEs) to invest in each country is largely attributable to factors such as labour and transportation costs, governments policies, and economic conditions. Dunning (1998) elaborates an economic theory based on three pillars to explain why MNEs invest in international markets instead of domestically. The pillars fall under the ownership, location, and internalisation (OLI) paradigm theory. Ownership refers to the unique advantage an MNE has in serving international markets compared to other firms. Location refers to the host market's factors, which encourages the MNE to invest in a particular market. Lastly, the internalisation advantage refers to the extent to which the MNE is interested in utilising its ownership advantage in a foreign market.

Over the years, the OLI paradigm has evolved to include additional

elements, chief of which is institutions. The definition of institutions rose with the new perspective of the institutional economics developed by North (1990). Described as "the rule of game," institutions consist of the structure and constraints that human impose when dealing with each other. North makes the distinction between formal institutions, represented by rules and laws, and informal institutions, represented by behavioural norms and constraint codes. Therefore, institutions encompass the norms and rules that govern internal and external relationships with different stakeholders. According to the eclectic paradigm, institutions are considered to have an influence on the three pillars of the OLI model. They provide, thereby, along with economic factors, an important understanding of MNEs' decision-making.

While location decisions of FDI were traditionally based on economic factors, interest in institutional factors has risen with this new perspective. Good institutions, which consist of the effectiveness of property rights, economic freedom, regulatory system and bureaucracy framework, increase the profitability of FDI (North, 1990). To illustrate the relationship and based on Dunning's eclectic paradigm and North's institutional theory, FDI inflows are a function of market size, macroeconomic stability, and institutional dimensions. The relationship is presented as follows:

FDI = f (*market size, macroeconomic stability, institutions*)

2.2 Empirical review

This section of our paper discusses three different strands of empirical research investigating the relationship between institutions and FDI inflows. The first strand analyses the importance of institutions by employing composite measures of institutional indicators. For instance, Buchanan et al. (2012) indicate that economies endowed with good institutions are able to attract important FDI, while the aggregated governance index has a significant negative impact on the volatility of FDI on a panel of 164 countries. Similarly, Peres et al. (2018) state that in the case of developed countries, governance has a positive effect on FDI, whereas in developing countries, it fails to attract FDI. Using system generalised method of moments (GMM), Sabir et al. (2019) provide evidence of a significant and positive relationship between the composite index of WGI dimensions

and FDI inflows to developing and developed countries. Further, Tun et al. (2012) obtain a composite index on five institutional indicators of the International Country Risk Guide (ICRG) and conclude that, in addition to trade openness, the institutional index is significantly positive.

The second strand of empirical studies analyses the relationship by employing different dimensions of institutional indicators. For instance, Daude and Stein (2007) consider four sources of institutional variables in the context of 58 countries, and state that, on the whole, good institutions have a positive and significant impact on the location of FDI. However, not all dimensions of institutions are statistically significant. Excessive regulatory burden, deficient enforcement of property rights, and unpredictable policy implementation discourage FDI inflows. From a sample of 83 developing countries over the period 1984 to 2003, Busse and Hefeker (2007) identify the main institutional determinants of FDI in African countries. They state that only democratic accountability of government, government stability, law and order, internal and external conflict, corruption and ethnic tensions, and quality of bureaucracy are positive and statistically significant. The findings of Kurul and Yalta (2017) suggest that controlling for corruption and bureaucratic burden, improving the political system and transparency led to an increase in FDI inflows. Only control of corruption, government effectiveness, and the voice and accountability are statistically significant and positive on FDI inflows to 113 developing countries.

The final strand of empirical literature investigates the effect of a specific institutional indicator on the FDI inflows. In an investigation of the relationship between corruption and FDI, Voyer and Beamish (2004) state that the association between Japanese FDI inflows to 59 emerging and developed countries and the level of corruption is statistically negative. This finding applies to some emerging markets for which regulatory frameworks are not efficient enough to cut out corruption opportunities. It is generally expected that corruption hinders FDI as it raises transaction costs and curb economic growth. However, empirical findings in the Middle East and North Africa (MENA) region stated that corruption and FDI vary positively (Helmy, 2013). Furthermore, Asiedu and Lien (2011) state that democracy has a positive impact on FDI inflows to 112 countries. However, the authors argue that natural resources, when included in the model, are found to significantly alter the impact by reducing the positive effect of democracy.

Overall, the literature explores the association between institutions and

FDI inflows using static models. Also, most studies focus on associations in countries according to economic region. Therefore, this paper fills in the gap by exploring the dynamic association between institutions and FDI inflows on countries classified by income level.

3. Data and Methodology

3.1 Data

Following the path of the empirical literature, this paper adopts a panel analysis approach to examine data for 141 developing and developed countries, classified by income level (see Appendix Table 1). The sample comprises 58 developing countries and 83 developed countries. Specifically, 23 are LI countries, 35 are LMI countries, 44 are HI countries and 39 are UMI countries. The sample size and time span are limited because of data availability constraints.

The dependent variable is the dollar value of net inflows of FDI, denoted FDI. This value was log-normalised to allow comparability (Ali et al., 2008; Sabir et al., 2019). The main explanatory variable is the institutional index, denoted INST, and is constructed through PCA.

Next to the main explanatory variable, we include four control variables, considered as the main determinants of FDI (Ali et al., 2008; Asongu et al., 2018; Egger & Winner, 2006): (i) Trade openness; (ii) Inflation; (iii) Infrastructure and (iv) GDP per capita growth. First, while trade openness measured by a ratio of total trade to GDP, denoted TO, has been demonstrated as an important determinant of FDI (Buchanan et al., 2012; Egger & Winner, 2006), the effect recently became ambiguous and debatable, as some studies pointed to the negative and insignificant impact of trade on FDI inflows (Asongu et al., 2018). Second, the negative relationship between inflation, measured as annual percentage change in consumer price index (CPI), and FDI net inflows has been proved in the literature (Asiedu, 2013; Busse & Hefeker, 2007). However, others have pointed to the existence of an insignificant and sometimes a positive impact of inflation especially when interacted with an institutional indicator (Henri & Larissa, 2018; Kinoshita & Campos, 2003). Third, good infrastructure increases the productivity of investments and therefore stimulates FDI inflows (Asiedu, 2002). The infrastructure proxy, denoted in our study as MOB, is represented

by mobile subscriptions per 100 people (Asiedu, 2002; Sabir et al., 2019).

Finally, to reflect the impact of financial crisis, we include global crisis dummies FC08 and FC09. Control variables are sourced from the World Development Indicators (WDI) and United Nations Conference on Trade and Development (UNCTAD) database for inflation variable (see Appendix Table 2).

3.2 Methodology

Principal component analysis (PCA)

The WGI institutional indicators capture the institutional environment of a given country in a multidimensional way (Buchanan et al., 2012; Daude & Stein, 2007; Globerman & Shapiro, 2002), therefore the likelihood of a potential multicollinearity problem in the model is strong. The correlation coefficients of the indicators and the institutional index confirm the multicollinearity problem between variables.

PCA is a statistical approach employed to deal with the problem of high correlated variables to create uncorrelated variables, or principal components. The approach helps us construct a composite index representing the original data with a minimal loss of information. This is done by retrieving data from the WGI governance indicators database (Kaufmann et al., 2010), namely control of corruption (CC), government effectiveness (GvE), political stability (PS), rule of law (RL), regulatory quality (RQ), and voice and accountability (VA).

Our study bases the choice of principal components on Kaiser (1974) who recommends the retention of PCs with an eigenvalue higher than 1. The summary of our results presented in Table 1 indicate that the eigenvalue of the first PC is retained to construct the institutional index (INST).

Table 1: Principal Component Analysis of the Institutional Index

High-income countries

	Eigenvalues			Eigen vectors (loadings)					
	Eigen value	Proportion	Cumulative proportion		PC1	PC2	PC3	PC4	PC5	PC6
1	4.475	0.745	0.745	VA	0.344	0.058	0.921	-0.150	0.029	0.066
2	0.647	0.107	0.853	PS	0.308	0.927	-0.150	0.143	-0.038	0.012
3	0.542	0.090	0.944	GE	0.449	-0.200	-0.156	-0.075	-0.829	0.197
4	0.198	0.033	0.977	RQ	0.428	-0.262	-0.035	0.797	0.274	0.186
5	0.074	0.012	0.989	RL	0.455	-0.135	-0.125	-0.134	0.112	-0.852
6	0.062	0.010	1	CC	0.438	-0.095	-0.293	-0.544	0.470	0.441

Upper middle-income countries

	Eigenvalues			Eigen vectors (loadings)					
	Eigen value	Proportion	Cumulative proportion		PC1	PC2	PC3	PC4	PC5	PC6
1	4.379	0.729	0.729	VA	0.394	0.034	0.880	0.031	-0.175	0.191
2	0.727	0.121	0.851	PS	0.321	0.825	-0.197	0.345	0.153	0.184
3	0.400	0.066	0.918	GE	0.426	-0.317	-0.396	-0.005	-0.422	0.617
4	0.251	0.041	0.959	RQ	0.406	-0.457	-0.045	0.596	0.468	-0.219
5	0.125	0.020	0.980	RL	0.451	0.088	-0.148	-0.116	-0.502	-0.707
6	0.115	0.019	1	CC	0.436	0.006	-0.066	-0.714	0.542	0.024

Lower middle-income countries

	Eigenvalues			Eigen vectors (loadings)					
	Eigen value	Proportion	Cumulative proportion		PC1	PC2	PC3	PC4	PC5	PC6
1	3.902	0.650	0.650	VA	0.359	0.057	0.885	-0.166	0.195	0.131
2	0.812	0.135	0.785	PS	0.336	0.687	-0.096	0.621	0.068	0.118
3	0.603	0.100	0.886	GE	0.439	-0.340	-0.364	-0.076	0.523	0.527
4	0.429	0.071	0.958	RQ	0.371	-0.604	0.093	0.569	-0.208	-0.346
5	0.138	0.023	0.981	RL	0.467	0.070	-0.127	-0.319	-0.762	0.277
6	0.113	0.018	1	CC	0.455	0.196	-0.220	-0.391	0.242	-0.702

Low-income countries

	Eigenvalues			Eigen vectors (loadings)					
	Eigen value	Proportion	Cumulative proportion		PC1	PC2	PC3	PC4	PC5	PC6
1	4.403	0.734	0.734	VA	0.357	0.629	-0.613	0.236	0.159	0.135
2	0.710	0.118	0.852	PS	0.364	0.544	0.746	-0.047	-0.081	0.070
3	0.362	0.060	0.912	GE	0.422	-0.371	0.114	-0.040	0.756	0.311
4	0.254	0.042	0.955	RQ	0.429	-0.169	-0.211	-0.629	-0.470	0.354
5	0.181	0.030	0.985	RL	0.456	0.090	-0.074	-0.164	0.055	-0.863
6	0.087	0.014	1	CC	0.410	-0.362	0.056	0.719	-0.414	0.090

Notes: VA: Voice and accountability. PS: Political stability. RQ: Regulatory quality. GvE: Government effectiveness. RL: Rule of law. CC: Control of corruption.

Source: Authors' own.

The composite index ranges from -2.72 to 2.03 for high-income countries. -2.59 to 2.16 for upper middle-income countries and -4.13 to 2.98 for lower middle-income countries and from -1.82 to 1.97 for low-income countries. Data on institutional variables are obtained from WGI database of Kaufmann et al. (2010). The definition of governance variables is given in Appendix Table 1.

Econometric estimation

The paper investigates the effect of institutions on FDI on 141 developed and developing countries over the period 2000 to 2017. According to earlier empirical research on the institutions-FDI relationship, we formulate the following model:

$$FDI_{it} = \beta_1\, FDI_{i.t-1} + \beta_2 INST_{it} + \beta_3\, Z_{it} + u_{it} \tag{1}$$

Where the dependent variable FDI_{it} represents the log form of net FDI inflows in US dollars. Taking into consideration the dynamic nature of FDI, a lagged value of the dependent variable at first difference (FDI_{it-1} is included in the model to the independent variables side. $INST_{it}$ stands for the institutional index constructed from PCA technique and Z_{it} are vectors of control variables of country i = (1.2.3. 4. …. N) during period t = (1.2.3.4. …. T). Z_{it} consists of vectors of control variables including the log of real GDP per capita growth, log value of net FDI inflows, mobile subscriptions in log form, inflation, trade openness and u_{it} as the error term.

Earlier studies on the impact of institutions on FDI stated that estimations under fixed effect (FE) models by the least square dummy variable (LSDV) might lead to an estimation bias, namely the endogeneity bias between the dependent variable and the institutional variable (Daude & Stein, 2007; Jude & Levieuge, 2017; Peres et al., 2018). Countries are not exogenously endowed with institutions (Buchanan et al., 2012; Globerman & Shapiro, 2002). Thereby, instrumental variable (IV) models could be used. However, with the problem of weak instruments, biases might arise. Another problem with FE and LSDV estimations is the presence of autocorrelation, as a lagged dependent variable is included to the regression. Therefore, solutions as the use of system GMM suggested by Arellano and Bover (1995) and Blundell and Bond (1998) are employed to address the biased estimations.

System GMM creates a system of two equations: the first equation is differenced, while the second remains in levels. The variables in levels of the level equation are instrumented with their lagged differences, the variables in the difference equation are instrumented with their lagged values, and the institutional variable is instrumented with legal origin as an instrument (Buchanan et al., 2012). The soundness of instruments is assessed by two main diagnostic tests: the Hansen test for over-identifying restrictions, and the autocorrelation diagnostic test represented by the first order autocorrelation AR (1), which should be statistically significant and the second order autocorrelation AR (2), which should be statistically insignificant. The estimations of lower middle-income, high-income, and upper middle-income countries are made using a FE model by employing the LSDV method, while the results for low-income countries are estimated using a FE model for which year dummies are not jointly significant.

4.   Results

4.1   *Summary statistics and correlation matrix*

We present the descriptive statistics for sample groups in Table 2. Although a maximum of three values are missing per panel, the data used in this study, for all the groups, is balanced. Statistics are based on data averaged on over the 2000 to 2017 period. One apparent feature of these statistics is that there is considerable variation in the data. The mean of the log of net inflows for HI countries is 9.89, UMI countries 8.97, LMI countries 8.67, and LI countries 7.96 during the study period. The dispersion of FDI around the mean value for HI countries is 0.89, while for UMI countries it is 1.04, LMI countries 0.81, and LI countries 1.06. It implies that HI countries have the highest FDI net inflows and LI countries the least.

Table 3 and Table 4 display correlation matrices for developed and developing countries. The correlation coefficients of the institutional index are positively correlated with FDI inflows in all panels, except for upper middle-income countries where the coefficient is negative. On the control variables side, the institutional index is positively correlated with the control variables except for inflation and GDP annual growth. The tables exhibit that the multicollinearity is not an issue since the correlation among variables is low. Most of the correlation coefficients are smaller than 0.36 and 0.52 in developing countries and developed countries, respectively.

Table 2: Description of Variables and Summary Statistics

	HI countries, n = 44					UMI countries, n = 38				
	Min	Max	Mean	SD	Obs	Min	Max	Mean	SD	Obs
Log of net FDI inflows (FDI)	6.301	11.866	9.809	0.899	790	4.505	11.463	8.974	1.048	700
Trade openness (imports + exports on GDP)	22.154	442.620	112.564	79.367	792	21.852	268.243	85.707	35.715	702
Inflation (consumer price index, annual %) (CPI)	-30.243	47.776	2.589	3.198	792	-10.067	168.620	6.689	10.781	702
Log of GDP per capita annual growth (%) (GDP)	-2.438	1.379	0.297	0.474	791	-1.989	1.754	0.416	0.484	702
Infrastructure (number of mobile subscriptions per 100 people) (MOB)	0.823	2.401	1.984	0.202	792	-0.735	2.261	1.696	0.502	700
PCA institutional index (INST)	-2.720	2.025	0.000	1.000	792	-2.595	2.162	0.000	1.000	702

	HI countries, n = 44					UMI countries, n = 38				
	Min	Max	Mean	SD	Obs	Min	Max	Mean	SD	Obs
Log of net FDI inflows (FDI)	5.163	10.647	8.672	0.813	630	0.000	9.825	7.964	1.063	414
Trade openness (imports + exports on GDP)	0.167	211.148	81.123	35.244	630	20.964	311.354	61.249	33.090	414
Inflation (consumer price index, annual %) (CPI)	-18.108	57.074	6.922	6.810	630	-72.729	513.906	10.091	34.464	414
Log of GDP per capita annual growth (%) (GDP)	-1.887	1.231	0.450	0.439	630	-4.086	1.562	0.358	0.579	414
Infrastructure (number of mobile subscriptions per 100 people) (MOB)	-1.610	2.180	1.411	0.749	627	-1.729	2.142	1.051	0.866	411
PCA institutional index (INST)	-4.137	2.980	0.000	1.000	630	-1.826	1.966	0.038	0.969	414

Notes: n: Number of countries, Obs: Observations, Min: Minimum, Max: Maximum, SD: Standard deviation.

Source: Authors' own.

Table 3: Correlation Matrix of Lower Middle-Income and Low-Income Countries

	FDI	TO	CPI	GDP	MOB	INST	VA	PS	GvE	RQ	RL	CC
Correlation matrix of lower middle-income countries												
FDI	1	-0.263	0.100	0.028	0.417	0.128	-0.098	-0.461	0.008	0.128	-0.124	-0.281
TO		1	-0.161	0.059	0.253	0.271	0.252	0.512	0.207	0.271	0.285	0.323
CPI			1	0.116	-0.151	-0.258	-0.150	-0.259	-0.271	-0.258	-0.222	-0.263
GDP				1	-0.132	-0.143	-0.147	0.058	-0.038	-0.143	-0.085	-0.084
MOB					1	0.365	0.209	0.048	0.245	0.365	0.185	0.197
INST						1	0.492	0.291	0.730	1.000	0.569	0.477
VA							1	0.412	0.433	0.492	0.598	0.555
PS								1	0.400	0.291	0.572	0.610
GvE									1	0.730	0.782	0.763
RQ										1	0.569	0.477
RL											1	0.865
CC												1
Correlation matrix of lower middle-income countries												
FDI	1	0.224	-0.038	0.052	0.352	0.149	0.149	0.186	0.174	0.168	0.201	0.098
TO		1	-0.045	0.098	0.078	0.006	0.006	-0.036	-0.272	-0.278	-0.198	-0.178
CPI			1	0.089	-0.223	-0.141	-0.141	-0.172	-0.175	-0.193	-0.173	-0.143
GDP				1	-0.108	-0.174	-0.180	-0.126	-0.009	-0.114	-0.099	0.014
MOB					1	0.142	0.142	0.203	0.022	0.112	0.109	0.054
INST						1	1.000	0.647	0.495	0.521	0.628	0.503
VA							1	0.647	0.495	0.600	0.674	0.567
PS								1	0.556	0.586	0.675	0.532
GvE									1	0.857	0.857	0.799
RQ										1	0.875	0.739
RL											1	0.808
CC												1

Notes: VA: Voice and accountability. PS: Political stability. RQ: Regulatory quality. GvE: Government effectiveness. RL: Rule of law. CC: Control of corruption.

Source: Authors' own.

Table 4: Correlation Matrix of Upper Middle-income and High-income Countries

Correlation matrix of upper middle-income countries											
	FDI	TO	CPI	GDP	MOB	INST	VA	PS	GvE	RQ	RL	CC
FDI	1	-0.351	-0.014	0.099	0.333	-0.226	-0.259	-0.389	0.129	0.207	-0.226	-0.135
TO		1	0.002	0.098	-0.093	0.120	-0.057	0.263	0.061	-0.025	0.120	0.077
CPI			1	0.070	-0.258	-0.171	-0.140	-0.092	-0.165	-0.242	-0.171	-0.099
GDP				1	-0.110	-0.106	-0.195	-0.034	-0.112	-0.098	-0.106	-0.125
MOB					1	0.121	0.118	0.061	0.260	0.241	0.121	0.140
INST						1	0.724	0.666	0.823	0.748	1.000	0.851
VA							1	0.509	0.611	0.664	0.724	0.712
PS								1	0.445	0.357	0.666	0.572
GvE									1	0.832	0.823	0.798
RQ										1	0.748	0.700
RL											1	0.851
CC												1
Correlation matrix of high-income countries											
	FDI	TO	CPI	GDP	MOB	INST	VA	PS	GvE	RQ	RL	CC
FDI	1	0.124	-0.179	-0.151	0.270	0.514	0.229	0.011	0.456	0.514	0.434	0.352
TO		1	-0.065	0.152	0.249	0.286	-0.123	0.289	0.192	0.286	0.136	0.116
CPI			1	0.026	-0.107	-0.211	-0.074	-0.023	-0.206	-0.211	-0.201	-0.141
GDP				1	-0.110	-0.097	-0.122	-0.056	-0.191	-0.097	-0.218	-0.220
MOB					1	0.165	0.023	-0.024	0.141	0.165	0.125	0.068
INST						1	0.610	0.459	0.873	1.000	0.870	0.790
VA							1	0.432	0.610	0.610	0.636	0.545
PS								1	0.515	0.459	0.554	0.556
GvE									1	0.873	0.931	0.904
RQ										1	0.870	0.790
RL											1	0.918
CC												1

Notes: VA: Voice and accountability. PS: Political stability. RQ: Regulatory quality. GvE: Government effectiveness. RL: Rule of law. CC: Control of corruption.

Source: Authors' own.

4.2 Estimated results and discussion

Findings for high- and upper middle-income countries

Table 5 displays the estimates for developed countries, obtained from Equation (1). It states the impact of the institutional index on FDI flows, while a more developed estimation, is reported in the Appendix Table 3.

Table 5: Estimation Results for High- and Upper Middle-Income Countries – System GMM

	Dependent variable: FDI			
Variables	**High-income countries**		**Upper middle-income countries**	
	Fixed Effect Model	**System GMM**	**Fixed Effect Model**	**System GMM**
FDI (t-1)		0.139 (0.045) **		0.619 (0.000) ***
TO	0.000 (0.723)	0.001 (0.323)	-0.001 (0.035)	-0.003 (0.217)
CPI	0.000 (0.877)	0.010 (0.092) *	-0.000 (0.590)	0.006 (0.455)
GDP	-0.000 (0.998)	-0.070 (0.178)	0.040 (0.197)	0.481 (0.004) ***
MOB	0.666 (0.000) ***	1.238 (0.000) ***	0.275 (0.000)***	0.367 (0.000) ***
INST	0.020 (0.667)	0.333 (0.002) ***	0.179 (0.001)***	0.139 (0.147)
FC08		0.012 (0.803)		0.144 (0.051) *
FC09		-0.133 (0.054) *		-0.147 (0.113)
Constant	8.509 (0.000)***	5.815 (0.000)***	8.688 (0.000)***	2.855 (0.009)***
Year dummies	Yes		Yes	
AR (1)		0.000		0.000
AR (2)		0.114		0.080
Hansen test		0.466		0.522
Nb observations	**792**	**792**	**702**	**702**

Notes: ***. ** and * denote significance at the 1%, 5% and 10% levels, respectively. The null hypothesis for AR (1) is defined as H_0 = there is no autocorrelation; H_0 for AR (2) is defined that H_0 = there is autocorrelation. For the Hansen test, the null hypothesis is defined such that H_0 = all instruments are exogenous as a group.

Source: Authors' own

By and large, the control variables of the developed countries have the expected sign, except for the GDP, trade openness and inflation. The coefficients associated with mobile and lagged FDI are significant and positive in both HI and UMI countries. A one percentage point increase in number of mobile phone users increases FDI inflows by 123% and 36.7% in HI and UMI countries respectively. The sign of the coefficient of mobile emphasises the importance of developed infrastructure in encouraging foreign investments in local economies. The coefficient of GDP per capita growth is, as expected, positive and significant, in UMI countries, but is interestingly negative and insignificant in HI countries.

The finding suggests that foreign investors may not consider the level of growth as a determining factor when deciding to invest in HI countries, as they may take into account other indicators such as institutional quality. Also, from an investor perspective, a large and fast-growing economy is generally associated with higher costs of doing business (Buchanan et al., 2012; Sabir et al., 2019).

The study expected the coefficient of inflation to be negative, but the estimation results yielded positive coefficients. The coefficient is insignificant in UMI countries and significant in HI countries. A more plausible explanation is that the effect of inflation varies with its level and the nature of the economy. Thus, there might exist a threshold level above which inflation dampens foreign investments (Agudze & Ibhagui, 2021). The trade sign is positive in HI, while it is negative in UMI countries. However, the coefficients are statistically insignificant. This finding is noteworthy, indicating that economies with higher trade openness, as it is the case for the developed countries, are not attractive to FDI flows.

Our main finding states that the institutional index has a positive impact on FDI in both HI and UMI countries. Even though the coefficient is not significant in UMI countries, it is, however, significant at 1% level in HI countries. This finding implies that, ceteris paribus, if the quality of institutions raises by a one percentage point, FDI net inflows to HI countries would increase by 33.3%. The coefficients suggest that, besides infrastructure, institutional quality is the second most important determinant of FDI in HI countries. The insignificant impact of institutional index on FDI entries in UMI countries, could be illustrated by the example of China, which witnessed huge net inflows of FDI in the 1990s, while the freedom index remained at the highest levels of political repression (Harms & Ursprung, 2002).

Columns (1) and (2) in Appendix Table 3 disclose the relationship between six governance indicators and FDI for HI and UMI countries, respectively. The estimations reveal that the effect of institutional quality on FDI varies with the dimension of the indicator. Overall, the estimates state that institutional quality is a sufficient determinant of FDI net inflows into HI countries. Governance indicators are positive in HI countries, with three out of six indicators statistically significant. The most important impact is associated with regulatory quality, as a 1% increase in the indicator increases FDI by 59%. A slightly lower impact is stated by the coefficients of rule of law and control of corruption. The findings imply that foreign investors tend to invest in HI countries as they are endowed with a good regulatory framework, offer good contract enforcement quality, and guarantee property rights protection. Furthermore, voice and accountability, political stability and government effectiveness positively but insignificantly influence FDI inflows.

For UMI countries, all dimensions are statistically insignificant, with three out of six negative. Similary to HI countries, the coefficients of government effectiveness, regulatory quality and rule of law are positive, but statistically insignificant. Estimates of control of corruption, voice and accountability, and political stability are, nevertheless negative and insignificant. The findings suggest that the countries reflect vulnerabilities in their institutional framework, thereby they are unable to influence FDI flows.

Findings for low- and lower middle-income countries

Table 6 displays the estimated coefficients for developing countries. Our results reveal that a large share of the variation in FDI can be explained by two main explanatory variables (mobile and lagged value of FDI) in LMI countries and three variables (inflation, mobile and lagged FDI) in LI countries. Mobile's coefficient is positive and statistically significant in both groups, which implies that either in developed or developing countries, FDIs are seeking countries endowed with a good infrastructure framework.

Contrary to the findings on developed countries, the coefficient of inflation is negative in LMI and LI countries. Although the estimate is not significant in LMI countries, it is statistically significant in LI countries. This finding is consistent with the evidences of Asiedu (2006) and Kinoshita and Campos (2003). It is surprising that most of the explanatory variables were

not found to be significant, despite the empirical and theoretical support of their relevance. With respect to trade openness, the coefficient estimate is found to be positive but insignificant in LMI and LI countries. Similarly, ceteris paribus, the coefficient of GDP per capita growth is found to be statistically insignificant in both groups.

Table 6: Estimation Results for Low- and Lower Middle-income Countries – System GMM

Dependent variable: FDI				
Variables	**Lower middle-income countries**		**Low-income countries**	
	Fixed Effect Model	**System GMM**	**Fixed Effect Model**	**System GMM**
FDI (t-1)		0.319 (0.012) **		0.744 (0.000) ***
TO	0.003 (0.005) ***	0.001 (0.967)	0.001 (0.182)	0.002 (0.581)
CPI	-0.006 (0.014) **	-0.001 (0.775)	0.000 (0.905)	-0.001 (0.003) ***
GDP	0.110 (0.003) ***	0.046 (0.447)	0.002 (0.750)	-0.000 (0.998)
MOB	0.296 (0.000) ***	0.382 (0.000) ***	0.451 (0.000) ***	0.155 (0.002) ***
INST	0.069 (0.038) **	-0.135 (0.191)	0.112 (0.153)	0.012 (0.885)
FC08		0.019 (0.759)		-0.036 (0.632)
FC09		-0.046 (0.574)		-0.104 (0.259)
Constant	8.135 (0.000) ***	5.386 (0.000) ***	7.376 (0.000) ***	1.781 (0.256)
Year dummies	Yes		No	
AR (1)		0.001		0.010
AR (2)		0.506		0.709
Hansen test		0.273		0.310
Nb observations	**630**	**630**	**414**	**414**

Notes: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. The null hypothesis for AR (1) is defined as H_0 = there is no autocorrelation; H_0 for AR (2) is defined that H_0 = there is autocorrelation. For the Hansen test, the null hypothesis is defined such that H_0 = all instruments are exogenous as a group.

Source: Authors' own.

Our findings suggest that FDI to developing countries are not market-seekers. One reason could be related to the fact that 60% of the countries included in the analysis (LI and LMI countries) are mostly small economies

and endowed with abundant natural resources. An illustration is given by the discovery of a gas field in Mozambique that attracted 15% of FDI net inflows of all sub-Saharan African countries in 2012, and US$26.6 billion worth of FDI in the period of 2010 to 2015 (WDI, 2019).

The coefficient of the institutional index is, interestingly, insignificant in developing countries. It is positive in LI countries and negative in LMI countries. The findings of system GMM are striking, specifically for LMI countries for which the estimate is negative. While the impact of the index is statistically significant and positive under the FE model, the coefficient is negative under system GMM. To understand the impact of the aggregated institutional index, we ran a more detailed analysis of the impact of the different dimensions of WGI indicators on FDI flows to developing countries (see Appendix Table 4).

Institutional indicators in Appendix Table 4 yielded some unanticipated results. All estimates of institutional indicators in LI countries are positive (three out of six indicators are significant), namely political stability, government effectiveness, and regulatory quality. The findings suggest that politically stable economies endowed with enhanced government regulatory quality stimulate FDI entries into LI countries. The findings for LMI countries suggest a negative impact of institutional indicators, except for a positive but insignificant impact of government effectiveness. The negative coefficients of voice and accountability, regulatory quality, and rule of law indicate that LMI countries are endowed with less transparent legal systems, poor quality of contract enforcements, poor regulatory framework, and low protection of property rights. This conclusion was stated by a report released by the United Nations Economic Commission for Africa (UNECA, 2009). According to the report, corruption remains the major cause of a poor institutional framework, namely in terms of poor regulatory framework, poor governance, lack of accountability and transparency, deficiency in citizen participation and lack of transparency. The continent recorded in 2004 a loss of over US$148 billion to corruption, representing 25% of its GDP (UNECA, 2009).

5.   Conclusion

Our paper provides an empirical analysis of the relationship between institutional quality and FDI in 141 across developed and developing

countries over the period 2000 to 2017. Countries fall under four subgroups, of which 44 are considered high income, 38 upper middle-income, 34 lower middle-income, and 23 countries low-income. Our research investigates the impact of an institutional index, constructed using PCA, on FDI net inflows to developed and developing countries depending on their income level. Further, we estimate the effect of the different dimensions of WGI indicators on the attractiveness of FDI net inflows. Estimations are made by employing system GMM.

The findings for developed countries suggest that the overall institutional environment is a robust determinant of FDI inflows, specifically in high income countries. For upper middle-income countries, however, the institutional quality is not a significant determinant of FDI. An in-depth analysis indicates that the effect of institutional quality on FDI varies with the dimension of the indicator. We find that regulatory quality, control of corruption and rule of law have positive significant impacts on FDI flows into HI countries. The implications for policymakers suggest that cutting out corruption opportunities, ensuring a good regulatory framework, and guaranteeing contract enforcement and property rights protection lead to an increase in FDI flows into HI countries. Furthermore, findings for UMI countries lead us to conclude that they reflect vulnerabilities in their institutional framework. Policymakers are, thereby, called to strengthen their institutional framework by reformulating their institutional strategies and create an investment conducive environment to increase foreign capital flows.

The overall impact of the institutional index on FDI flows in developing countries is insignificant and interestingly striking. The findings suggest that politically stable economies endowed with an efficient and a credible government and strong regulatory framework tend to attract FDI flows into LI countries. The findings for LMI countries imply a negative but insignificant impact of institutional indicators on FDI flows. The major policy implication is that developing countries should go beyond enhancing their institutional framework by focusing on corruption control, enhancing their regulatory framework, and empowering government commitment to serve citizens' needs.

One main limitation of the paper relates to the use of WGI governance indicators. The procedure used to construct various dimensions of WGI indicators is not based on a conceptual or analytical framework to explain

the scoring. The lack of an analytical framework to define what a 'good' institutional framework is may wrongly estimate the relevant impact of institutions on FDI flows. Also, WGI indicators only reflect the political dimension of institutions. Thereby, in the face of these findings, this paper recommends further study to analyse the threshold level above which the impact of institutions on FDI flows changes. Also, it is interesting to explore a wider range of institutional dimensions as to cover economic institutions.

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Declaration of interests

Authors declare that they have no competing interests.

Notes

[1]   Percentage changes are calculated by the authors based on the World Bank Indicators on global FDI net inflows.

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Appendix Table 1: Sample of Countries – Categorisation by Income Level

List of developing countries

Low-income countries

Benin, Burkina Faso, Burundi, Central African, Chad, Congo. Dem Rep, Ethiopia, Gambia, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Rwanda, Senegal, Sierra Leone, Tajikistan, Tanzania, Togo, Uganda, Zimbabwe

Lower middle-income countries

Armenia, Bangladesh, Bhutan, Bolivia, Cabo Verde, Cambodia, Cameroon, Congo Rep, Egypt, El Salvador, Georgia, Ghana, Guatemala, Honduras, India, Jordan, Kenya, Kyrgyz Republic, Lao PDR, Lesotho, Mauritania, Mongolia, Moldova, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Philippines, Solomon Islands, Sudan, Tunisia, Ukraine, Vanuatu, Zambia

High-income countries

Australia, Austria, Bahamas, Barbados, Belgium, Canada, Chile, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, Ireland, Israel, Italy, Korea Republic, Kuwait, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland Portugal, Qatar, Saudi Arabia, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, United States, Uruguay

Upper middle-income countries

Albania, Algeria, Argentina, Belarus, Belize, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Equatorial Guinea, Fiji, Gabon, Guyana, Iraq, Jamaica, Kazakhstan, Malaysia, Mauritius, Mexico, Namibia, Panama, Paraguay, Peru, Romania, Russian Federation, Samoa, South Africa, St. Lucia, St. Vincent, Suriname, Thailand, Tonga, Turkey

Appendix Table 2: Description of Variables

Variable	Definition
Control of corruption (CC)	(Estimate) Captures 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
Government effectiveness (GvE)	(Estimate) Captures 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.
Political stability (PS)	(Estimate) and Absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.
Rule of law (RL)	(Estimate) Captures 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.
Regulatory quality (RQ)	(Estimate) Captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Voice and accountability (VA)	(Estimate) Captures 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.

Source: Worldwide Governance Indicators (WGI).

Appendix Table 3: WGI Indicators and FDI in Low- and Middle Lower-Income Countries

	VA		PS		GvE		RQ		RL		CC	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
FDI (-1)	0.74	0.32	0.68	0.32	0.66	0.29	0.68	0.33	0.67	0.29	0.72	0.35
	(0.000)***	(0.012)**	(0.000)***	(0.006)***	(0.000)***	(0.007)***	(0.001)***	(0.006)***	(0.000)***	(0.020)**	(0.000)***	(0.016)**
TO	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	0.00	0.00	-0.00	0.00	0.00
	(0.580)	(0.273)	(0.590)	(0.657)	(0.349)	(0.854)	(0.185)	(0.804)	(0.329)	(0.512)	(0.388)	(0.634)
CPI	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	-0.00	-0.00	0.00	-0.00	0.01
	(0.002)***	(0.834)	(0.019)**	(0.420)	(0.129)	(0.461)	(0.011)**	(0.899)	(0.088)*	(0.573)	(0.037)**	(0.498)
GDP	-0.00	0.03	-0.00	0.10	-0.00	0.10	-0.00	0.03	-0.00	0.04	-0.00	0.07
	(0.991)	(0.560)	(0.289)	(0.094)*	(0.747)	(0.056)*	(0.805)	(0.538)	(0.544)	(0.544)	(0.534)	(0.211)
MOB	0.15	0.41	0.16	0.39	0.19	0.34	0.18	0.37	0.17	0.49	0.16	0.34
	(0.001)***	(0.000)***	(0.003)***	(0.000)***	(0.000)***	(0.001)***	(0.002)***	(0.000)***	(0.004)***	(0.000)***	(0.002)***	(0.005)***
GOV	**0.01**	**-0.32**	**0.19**	**-0.04**	**0.87**	**0.12**	**0.84**	**-0.40**	**0.39**	**-0.66**	**0.19**	**-0.09**
	(0.901)	**(0.08)***	**(0.056)***	**(0.757)**	**(0.016)****	**(0.463)**	**(0.006)***	**(0.097)***	**(0.318)**	**(0.010)***	**(0.512)**	**(0.636)**
FC08	-0.03	0.00	-0.07	-0.02	-0.05	0.00	-0.01	0.00	-0.06	-0.04	-0.08	-0.02
	(0.635)	(0.897)	(0.310)	(0.827)	(0.481)	(0.987)	(0.887)	(0.920)	(0.363)	(0.625)	(0.249)	(0.863)
FC09	-0.10	-0.11	-0.09	-0.11	-0.07	-0.09	-0.03	-0.04	-0.08	-0.12	-0.10	-0.09
	(0.262)	(0.243)	(0.184)	(0.118)	(0.316)	(0.175)	(0.653)	(0.577)	(0.335)	(0.049)**	(0.189)	(0.177)
Constant	1.80	5.50	2.46	5.34	3.16	5.69	2.75	4.96	2.65	5.26	2.12	5.00
	(0.229)	(0.000)***	(0.032)**	(0.000)***	(0.001)***	(0.000)***	(0.073)*	(0.000)***	(0.102)	(0.000)***	(0.128)	(0.000)***
AR(1)	0.010	0.000	0.008	0.001	0.005	0.002	0.018	0.001	0.010	0.002	0.006	0.002
AR(2)	0.710	0.516	0.710	0.492	0.645	0.303	0.694	0.433	0.682	0.572	0.728	0.247
Hansen	0.313	0.370	0.546	0.224	0.865	0.337	0.513	0.195	0.582	0.465	0.406	0.330

Notes: ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. (1) low-income countries, (2) lower middle-income countries.

Source: Authors' own.

Appendix Table 4: WGI Indicators and FDI in High- and Upper Middle-Income Countries

	VA		PS		GvE		RQ		RL		CC	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
FDI (-1)	0.31	0.58	0.29	0.57	0.19	0.51	0.15	0.52	0.24	0.62	0.15	0.58
	(0.049)**	(0.000)***	(0.006)***	(0.000)***	(0.020)**	(0.000)***	(0.023)**	(0.000)***	(0.007)***	(0.000)***	(0.042)**	(0.000)***
TO	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00
	(0.955)	(0.463)	(0.436)	(0.636)	(0.617)	(0.273)	(0.393)	(0.290)	(0.570)	(0.192)	(0.360)	(0.398)
CPI	0.10	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00
	(0.100)*	(0.633)	(0.714)	(0.444)	(0.133)	(0.299)	(0.051)*	(0.328)	(0.181)	(0.429)	(0.165)	(0.519)
GDP	-0.08	0.00	-0.01	-0.01	-0.06	-0.02	-0.06	0.01	-0.05	0.03	-0.07	-0.03
	(0.133)	(0.901)	(0.791)	(0.695)	(0.196)	(0.600)	(0.241)	(0.709)	(0.315)	(0.437)	(0.152)	(0.593)
MOB	1.22	0.32	1.08	0.34	1.39	0.31	1.20	0.33	1.15	0.29	1.43 (	0.24
	(0.000)***	(0.000)***	(0.000)***	(0.001)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.002)***	(0.000)***	(0.001)***
GOV	**0.15**	**-0.03**	**0.06**	**-0.09**	**0.04**	**0.01**	**0.59**	**0.15**	**0.41**	**0.45**	**0.27**	**-0.06**
	(0.271)	**(0.756)**	**(0.677)**	**(0.321)**	**(0.771)**	**(0.925)**	**(0.011)****	**(0.324)**	**(0.062)***	**(0.793)**	**(0.093)***	**(0.588)**
FC08	-0.05	0.13	0.01	0.12	0.00	0.16	0.02	0.15	0.00	0.13	0.01	0.15
	(0.548)	(0.007)***	(0.787)	(0.068)*	(0.931)	(0.001)***	(0.639)	(0.000)***	(0.976)	(0.030)**	(0.837)	(0.015)**
FC09	-0.11	-0.28	-0.14	-0.27	-0.09	-0.24	-0.15	-0.23	-0.10	-0.27	-0.10	-0.27
	(0.267)	(0.004)***	(0.48)	(0.008)***	(0.241)	(0.008)***	(0.042)**	(0.013)**	(0.243)	(0.009)***	(0.187)	(0.010)***
Constant	4.12	3.30	4.61	3.36	4.97	4.17	5.04	3.97	4.64	3.18	4.91	3.59
	(0.001)***	(0.003)***	(0.000)***	(0.022)**	(0.000)***	(0.001)***	(0.000)***	(0.000)***	(0.000)***	(0.008)***	(0.000)***	(0.007)***
AR(1)	0.004	0.001	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.001	0.000	0.001
AR(2)	0.154	0.100	0.099	0.127	0.152	0.128	0.119	0.102	0.132	0.097	0.154	0.115
Hansen	0.166	0.305	0.408	0.432	0.209	0.553	0.546	0.629	0.337	0.340	0.562	0.341

Notes: : ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. (1) high-income countries, (2) upper middle-income countries.

Source: Authors' own.