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The Race to the Top: Institutional Clusters and World FDI Shares

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Abstract:

The literature on the institutions-FDI nexus has treated the influence of institutions independently of each other. This implies they are not related to one another both theoretically and empirically, an important shortcoming. To address this shortcoming empirically, we use Principal Component Analysis (PCA). PCA is used to extract correlated institutional "clusters".

The influence of correlated groups of institutions or institutional clusters on FDI flows is examined empirically in this paper. Using ICRG data for a large sample of 130 countries over the period 1984-2014, PCA extracts three institutional clusters: quality of public administration, social cohesion, and stability and property rights protection.

Building on Dunning's (1981) location advantage hypothesis to examine the influence of those clusters on the competition to attract FDI flows, as measured by the share of world FDI flows, empirical evidence shows that "social cohesion" has a positive influence on the share of FDI flows. Results are robust to changes in the nature of unobserved effects controlled for, model specification, and sample period. This result is particularly novel in the literature.

These results have two important policy implications. First, countries should adopt a wider perspective in examining the influence of institutions on FDI. Second, such a perspective provides governments with flexibility in the design and implementation of institutional reforms.

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1. Introduction

The political system, comprised of political and legal institutions, serve to facilitate people's collective action regarding the provision of public goods, such as education, health, and infrastructure.[2] Political institutions help facilitate the provision and maintenance of human and physical capital needed for growth and development. Legal institutions on the other hand comprise the set of laws and regulations, which help organize and govern people's transactions in the economy. Dixit (2009) advocates that legal institutions, through property rights protection and contract enforcement, reduce uncertainty of consumer and capital goods exchange, and thus transaction costs including production costs. Therefore the political system with its political and legal institutions influence human and physical capital accumulation and the level of economic activity (North 1991).

The effect of political and legal institutions on capital flows has been examined in the capital flows literature, for example in Daude & Fratzscher (2008) , De Santis & Luhrmann (2009), Fratzscher (2102), and Papaioannou (2009). Investigating the effect of global shocks on global portfolio investment flows, Fratzscher (2012) finds that the strength of political institutions and reduced country risk ameliorate the effect of these shocks. Similarly Daude & Fratzscher (2008) and De Santis & Luhrmann (2009) find that the quality of institutions in general matters most for portfolio investment. Examining the role that legal institutions play in attracting capital flows, Papaioannou (2009) finds that weak property rights protection, inefficient legal system and a high risk of investment expropriation deter banking flows.

In the capital flows literature examination of the influence of individual institutions has been common. Empirically because of the way institutions are measured, introducing a number of institutions in empirical models raises an issue of multicollinearity. To avoid this problem, usually institutions are introduced individually while other highly correlated institutions are dropped. This treatment however ignores the interrelationship between institutions and the possibility that one institution may be capturing another institution. In other words, it implies that institutions are conceptually "independent" of each other. A more comprehensive approach than just using individual institutions is needed since the

[2] Institutions are mainly the formal rules, which govern human behavior (North 1991).

presence of multicollinearity spoils the disentanglement of the effect of different institutions (Jellema and Roland 2011).

An alternative approach has been the use of aggregate (linear) measures of institutions. Bundling institutions into an aggregate measure helps address the multicollinearity problem associated with unbundling institutions. However, this approach suffers two problems.[3] First, it does not help examine influence of individual institutions. Second, it also implicitly assumes that institutions are "independent" and linearly related.

In this paper, we address this institutional correlation problem in examining the influence of institutions on FDI flows. Applying Principal Component Analysis (PCA) to a panel of institutions reveals three orthogonal clusters or themes, which are based on correlated institutions. The first can be interpreted as the quality of public administration, while the second and third clusters can be "social cohesion" and "stability and property rights protection", respectively.

The extent to which these institutional clusters influence FDI flows is then empirically examined. Building on Dunning's (1981) location advantage hypothesis, institutional clusters, as opposed to individual institutions, may foreign investors' perceptions about countries competitiveness compared to other countries. Thus we explore empirically the extent to which clusters matter for countries' shares of world FDI flows.

We use a sample of 130 countries over the period 1984-2014 and least squares dummy variables (LSDV) approach. LSDV allows us to account for country-specific effects, which may impact (relative) FDI flows individual countries can attract. It also allows for time-specific effects, arising for example from global business cycles or financial crises, which may impact world FDI flows.

Empirical evidence shows that of the three extracted clusters "social cohesion" matters for a country's location advantage. Social cohesion has a positive influence on the share of world FDI flows. This finding is robust to changes in the nature of unobserved effects controlled for, model specification, and sample period. This particular result is novel in the institutions-FDI literature and has important policy implication for institutional reforms.

Section 2 provides a brief literature review of the institutions-capital flows nexus focusing on how institutions are accounted for in empirical modelling. Section 3 specifies the empirical model and the data sources. Section 4 discusses the empirical issues and

[3] In addition to these two problems, aggregate measures have "often based on subjective evaluations, contain significant noise, are suspiciously volatile, and are likely to be biased or contaminated by perceptions of a country's economic performance" (Jellema and Roland 2011, p108).

estimation methodology. Section 5 discusses the empirical results, while section 6 concludes.

2. Capital flows and institutions - literature review

Most studies on the institutions-capital flows nexus have assumed no correlation between institutions (Aleksynska and Havrylchyk 2013; Alfaro et al. 2008; Busse et al. 2010; Daude and Fratzscher 2008; Papaioannou 2009; Fratzscher 2012; and Shah et al. 2016). Only the study by Globerman and Shapiro (2002) accounted for institutional correlation in examining the influence of governance infrastructure on FDI flows.

In examining the institutions-FDI nexus, Globerman and Shapiro (2002) examine the role of "governance infrastructure" on inward and outward FDI flows for 144 developed and developing countries over the period 1995-1997. They employ governance indices estimated by Kaufmann et al. (1999a; 1999b), including political instability, rule of law, graft, regulatory burden, voice and political freedom, and government effectiveness. Because of the significant correlation between these indicators and the difficulty of employing them in a single equation, they use a principal component of these indicators, an approach similar to what we adopt in this paper. They found a positive impact of the governance principal component on inward FDI flows but at a diminishing rate suggesting that governance plays more important role in small as opposed to large economies.

In contrast to Globerman and Shapiro (2002), most empirical studies assumed no institutional correlation. Alfaro et al. (2008) examine the Lucas paradox, where there is a decline in capital flows from rich to poor countries over the period 1970-2000. They find that low institutional quality explains such decline. They measure institutional quality using the period average of the sum of ICRG indicators, including the risk of investment expropriation, government stability, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability, and quality of bureaucracy. Similarly, addressing the Lucas paradox from bank lending flows, Papaioannou (2009) finds that institutional quality matters for bank flows. He uses ICRG's "political risk" rating to proxy for institutional quality.

Daude and Fratzscher (2008) in examining the pecking order of cross-border investment, comprising FDI, portfolio equity, debt and loans, in a sample of 77 countries find that information frictions and institutional quality in host countries matter for this order. They find that the FDI size and share (in total capital stock) are largely insensitive to

institutional quality in contrast to portfolio investment sensitivity. They measure institutional quality using transparency, risk of investment expropriation, and corruption.[4] More recently Fratzscher (2012) examines the 2008 global financial crisis and the post crisis recovery. He finds that crisis impact and recovery depends on the quality of domestic institutions. He uses ICRG's financial and political risk indexes to assess institutional quality.

Busse et al. (2010) examine the effect of bilateral investment treaties on bilateral FDI flows, accounting for the degree of development of political institutions. They find that bilateral investment treaties encourage FDI flows. In accounting for political institutions, they use Henisz's (2000) political constraints on the executive branch as a proxy.

Aleksynska and Havrylchyk (2013) examine the location decisions of FDI flows emanating from the south and find that institutional distance between the south and north matters for FDI with larger distance discouraging FDI flows. This negative effect diminishes with resource abundance in the host countries. To assess institutional distance, they use the six World Bank governance indicators - voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law and control for corruption.

Recently, Shah et al. (2016) investigate the bidirectional causality between institutions and sectorial FDI for Pakistan using ARDL. They use ICRG's individual and aggregate measures of institutions. Individual institutions include the risk of investment expropriation (investment profile), law and order, government stability, corruption, democratic accountability, and bureaucracy quality. They find long-term bidirectional causal relationship between institutional quality on the one hand and aggregate FDI, and FDI in services and manufacturing on the other hand. Short-term bidirectional causal relationship is found with manufacturing FDI.

3. Empirical model and data

The empirical model of this paper builds on the location advantage hypothesis of Dunning's (1981) ownership-location-internalization (OLI) paradigm. According to the OLI paradigm, a firm produces abroad building on three types of advantages: ownership (O), location (L), and internalization (I).

A firm's ownership advantages arise from its possession of intangible assets, such as technology, patents, and skilled management. The firm itself does not possess location

[4] They are guided in their choice of institutional variables by the theoretical literature.

advantages but rather the host economy it invests in. For example, the host economy may enjoy large market size and potential, cheap skilled labor, developed infrastructure, openness to trade and capital flows, developed financial markets, friendly business environment, and quality domestic institutions. The internalization advantage emanates from the firm's own engagement in production abroad rather than relying on the market, in the form of licensing or subcontracting for example, because of the higher transaction costs of the latter.

Since the purpose of this paper is to examine the influence of institutional clusters on foreign investors' perceptions about the location competitiveness of countries, the dependent variable we consider is the share of world FDI flows. The based empirical model we adopt is expressed as:

$$FDI_{i,t} = \beta_0 + \beta_1 GDPCAPITA_{i,t} + \beta_2 POP_{i,t} + \beta_3 INFRASTRUCTURE_{i,t} + \beta_4 CLUSTERS_{i,t} + \varepsilon_{i,t} \quad \textbf{(1)}$$

where *FDI* is the country's share of world FDI inflows (in percentage), *GDPCAPITA* is real GDP per capita measured in constant 2010 international dollars (log) to account for the host country income level, *POP* is population size (log) to account for host country size, *INFRASTRUCTURE* is measured using the number of mobile phone subscriptions (per 100 people - log) to account for infrastructure development, *CLUSTERS* is the institutional clusters extracted using PCA, and the subscripts *i* and *t* are country and time indexes.

In our analysis we use panel data on a sample of 130 countries over the period 1984-2014.[5] Data on the dependent variable – the share of world FDI inflows - are obtained from UNCTADSTAT database. Data on *GDPCAPITA*, *POP*, and *INFRASTRUCTURE* are obtained from the World Bank's World Development Indicators (WDI). Data on *CLUSTERS* are available from International Country Risk Guide (ICRG).

[5] These are Albania, Algeria, Angola, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Belarus, Belgium, Bolivia, Botswana, Brazil, Brunei, Bulgaria, Burkina Faso, Cameroon, Canada, Chile, China, Colombia, Congo, Costa Rica, Cote d'Ivoire, Croatia, Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Ethiopia, Finland, France, Gabon, Gambia, Germany, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kenya, Kuwait, Latvia, Lebanon, Liberia, Libya, Lithuania, Luxembourg, Madagascar, Malawi, Malaysia, Mali, Malta, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sudan, Suriname, Sweden, Switzerland, Tanzania, Thailand, Togo, Trinidad & Tobago, Tunisia, Turkey, UAE, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Yemen, and Zambia.

ICRG data include 12 political risk components: a) government stability, b) socioeconomic conditions, c) investment profile, d) internal conflict, e) external conflict, f) corruption, g) military in politics, h) religion in politics, i) law and order, j) ethnic tensions, k) democratic accountability, and l) bureaucracy quality. We exclude socioeconomic conditions since they are related to economic performance, which likely affects perceptions about institutions as Jellema and Roland (2011) argue. Higher (lower) scores indicate lower (higher) risk and better (worse) institutional performance.

Government stability measures the government power to undertake its announced economic and political programs and remain in office. This power depends on and is measured by government unity, legislative strength and the support of people. The maximum score is 12. *Investment profile* assesses risk factors, which affect investment in the country. Risk factors include the extent of contract expropriation, the degree to which investors repatriate earned profit and delays in government payments back to investors. The maximum score is 12. *Internal conflict* measures political violence and its impact on governance. The maximum score is 12. *External conflict* measures the risks of wars and cross-border conflicts to the incumbent government. The maximum score is 12. *Corruption* assesses the degree of corruption within the political system. The maximum score is 6. *Military in politics* assesses the degree of interference and involvement of the military establishment in politics. The maximum score is 6. *Religion in politics* measures the domination of a single religious group and its intent, attempts and/or success to replace civil laws by religious law and exclude other religions from the social and/or political process. The maximum score is 6. *Law and order* measures the degree of strength, independence, and unbiasedness of the legal system and people's observance of law. The maximum score is 6. *Ethnic tensions* measure the degree of racial, national, and linguistic tensions. The maximum score is 6. *Democratic accountability* measures the responsiveness of government to its people. The maximum score is 6. *Bureaucracy quality* assesses the strength to govern without severe changes in policy and/or interruptions in the provision of public services. The maximum score is 4.

4. Empirical issues and estimation methodology

We account for three main issues in the empirical methodology. The first issue is the identification of institutional clusters using PCA and the interpretation of their estimated coefficients. The second is the presence of panel unit root processes associated with

explanatory variables time series. The third is the presence of potential endogeneity, arising from the presence of unobservable country and/or time effects, simultaneity, and variable omission.

A. Identification of institutional clusters

The first issue is to identify institutional clusters using PCA. Identification of clusters is based on the correlation between institutions. While extracting clusters is a straightforward task theoretically, correlation among institutions might not be strong enough to render such extraction a simple task practically. In addition, interpreting or labeling these clusters is subjective depending on the institutional composition of these clusters.

As Norman and Streiner (2008) explain, the idea of PCA is to explain the variance among a number of variables in terms of orthogonal principal components. In doing so, PCA obtains a series of linear combinations of variables which define each component, with the number of linear combinations or components equal to the number of variables.[6] A principal component i takes the following form:

$$PC_i = w_{i1}x_1 + w_{i2}x_2 + \cdots + w_{ik}x_k \qquad \textbf{(2)}$$

where x is a variable, w is the weight, i is variable indicator with $i = 1, \dots, k$. The weight w has two subscripts, with the first one indicating the principal component, and the second one indicating the variable it relates to. The *w*'s for the principal components are chosen in such a way that sequentially expresses the largest amount of variance in the sample. For example for the first principal component, *w*'s express the largest amount of variance in the sample, while for the second component *w*'s are derived in such a way that the second component is uncorrelated to the first one and expresses the next largest amount of variance.

One criterion for choosing among the derived principal components (clusters) is the Kaiser criterion. According to this criterion, principal components with eignevalues exceeding 1 are selected. In *interpreting* the principal components, we will adopt and compare the results of orthogonal (Varimax) and non-orthogonal, oblique (Promax) rotation methods to ensure robustness of the identified principal components.

[6] See Norman and Streiner (2008) page 198.

We should point out that the interpretation of the estimated coefficients of principal components (clusters) can be challenging. To simplify such task, we conduct our PCA on the Z-scores of ICRG institutions. This has two advantages. First, it does not alter the results. Second, it makes the interpretation of the coefficients easier. *The estimated coefficients are interpreted as the influence of an increase of one standard deviation of the principal component on the share of world FDI flows.*

B. Presence of Unit Root

The second issue is to detect potential unit root process, which results in spurious regressions. We use the Fisher (Dickey Fuller) test to test the null hypothesis of presence of unit root process. Although there are other panel unit root tests available, such as Levin, Lin and Chu (LLC) for common unit root process, and Im, Pesaran and Shin (IPS) for individual unit root process, these tests in STATA require balanced panels.

C. Endogeneity, Causes, and Estimation

The third issue is to address potential endogeneity, defined as the correlation between the explanatory variables and the error term. Endogeneity may result from the presence of unobservable country or time effects, simultaneity, or variable omission. The presence of endogeneity results in inconsistent ordinary least squares (OLS) estimates.

To account for country and/or time specific effects, we use least squares dummy variables (fixed effects) approach. In detecting simultaneity between the dependent and explanatory variables, we use Granger-causality tests.

5. Empirical results

A. *Descriptive statistics*

Appendix A provides a glimpse of the performance of the 130 sample countries for the (non-logarithmically transformed) explanatory variables. Among the sample countries, the US stands out with average share of world FDI flows, which amounts to more than one fifth. Qatar enjoys the highest real GDP per capita which is above $122,000, while China has the highest population size of about 1.2 billion. Serbia has the highest number of mobile subscription (per 100 people) amounting to 105.

Focusing on institutional performance, the highest average relative performance for countries on which ICRG data are available, in descending order, is for external conflicts, religion in politics, internal conflicts, ethnic tensions, government stability, democratic accountability, military in politics, investment profile, law and order, bureaucracy quality, and corruption (Table 1).[7] The highest (lowest) mean-scaled variation is for the degree of military involvement in politics (external conflicts).[8] In the next sub-section, we will look at how the different institutions are correlated to each other, which affects the empirical examination of the impact of institutions on FDI flows. This correlation however is useful in the extraction of principal components or institutional clusters.

[Insert Table 1 here.]

B. *Identification of institutional clusters*

Table 2 presents the correlation coefficients matrix for the different institutions. Internal conflict, law and order, military in politics (in descending order) have the highest sums of correlation coefficients among the different institutions, while corruption, ethnic tensions, and religion in politics have the lowest.[9] For example, internal conflict is highly correlated with law and order, external conflict, military in politics, and ethnic tensions. Therefore as one examines the influence any of these institutions on FDI flows, we are very likely capturing the influence of some other institution.

[Insert Table 2 here.]

This correlation is useful in the extraction of principal components or institutional clusters. Identifying correlation coefficients of 0.3 and above in the correlation matrix is the basic requirement for a successful factor extraction, as Norman and Streiner (2008) point out based on Tabachnick and Fidell (2001).

Assessing sampling adequacy, the Kaiser-Meyer-Olking (KMO) statistic amounts to 0.878 suggesting that the different institutions will likely load on components. The Bartlett's test of sphericity shows a *p* value of 0.000, which suggests that the correlation matrix is not an identity matrix.[10]

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[7] The average relative performance is expressed as a ratio of the maximum score.
[8] This is also known as the coefficient of variation or relative variability.
[9] The order of the sums of correlation coefficients is: internal conflict, law and order, military in politics, bureaucracy quality, democratic accountability, investment profile, external conflict, corruption, ethnic tensions, and religion in politics.
[10] The Chi-square value amounts to 23,173.8 and the *p*-value is 0.000.

Table 3 shows the 11 principal components obtained, with three components having eigenvalues exceeding 1 according to the Kaiser criterion. The three components explain nearly 70 percent of the cumulative variance. The first component alone explains nearly half of the variance. The factor loadings of the first component (under the non-rotated panel of table 3) show highest correlation (absolute value of about 0.6 and above) with internal conflict, law and order, military in politics, bureaucracy quality, democratic accountability, corruption, investment profile (risk of investment expropriation), external conflict, and ethnic tensions. The factor loadings of the second component show highest correlation with government stability, while those of the third component show highest correlation with religion in politics.

[Insert Table 3 here.]

To identify institutional clusters, we need to interpret the components. Norman and Streiner (2008) point out that the factor loadings (component) matrix should satisfy four conditions: a) variance should be evenly distributed across retained factors; b) each variable should load on only one factor; c) factor loadings should be close to 1 or zero; and d) factors should be unipolar (either positive or negative). These four conditions ease the interpretation of the component analysis results and create structural simplicity.

Assessing these four conditions in light of table 3, the retained factors account for 0.49, 0.12, and 0.10 of the variance, respectively. While the first factor dominates the other two factors variance-wise, in our opinion this is not an extremely uneven distribution. Nine of the 11 institutions have factor loadings on the first factor. The factor loadings of these institutions exceed 0.6 and four of the nine institutions have loadings, which are close to 1 (about 0.8 and above). Finally, the first factor is certainly positive/unipolar, while the second and third factors are mostly negative with six of the 11 institutions carry negative factor loadings.

In light of the above results, we should point out that Norman and Streiner (2008) argue that, "From a mathematical viewpoint, nothing is wrong with most of the variance being in one factor, or with factorial complexity, or with loadings in the middle range, or with bipolar factors. However, it is easiest to interpret the results of a factor analysis if we can meet these criteria and aim for structural simplicity. This is what rotating the factors tries to do." (page 202).

Thus our next step is to rotate the extracted components using both the orthogonal, Varimax and non-orthogonal (oblique), Promax methods. The latter allows for correlation

among the components or institutional clusters in consistence with our conceptual viewpoint. Table 3 reports the structure matrix for the three non-orthogonally (obliquely) rotated factors.[11] The structure matrix reports the correlation between institutions and factors. We also report the orthogonally rotated factors using the orthogonal, Varimax method, which assumes no correlation among the different components.[12]

Non-orthogonal (oblique) rotation structure matrix reports that bureaucracy quality, military in politics, democratic accountability, corruption, and law and order have the highest correlation with the first component. Internal conflict, ethnic tensions, religion in politics, and external conflict have the highest correlation with the second component. For the third component, government stability and the risk of investment expropriation have the highest correlation with the third component.

One may interpret the first component as the quality of public administration.[13] The second component may be interpreted as social cohesion. The third component may be interpreted as stability and property rights protection.

C. Non-stationarity and endogeneity

We report the augmented Dickey-Fuller panel unit root test results in table 4. Results indicate rejection of the null hypothesis of the presence of unit root process for *FDI*, *POP*, *INFRASTRUCTURE*, *CLUSTER1*, and *CLUSTER2*. However for *GDPCAPITA* and *CLUSTER3*, we failed to reject the null hypothesis and accordingly we took the first difference. First differencing these variables has resulted in the rejection of the null hypothesis.

[Insert Table 4 here.]

Examining the presence of simultaneity, we undertook Granger-causality tests on the stationary series. Granger causality test statistics, shown in table 5, indicate that *FDI* does not Granger-cause any of the explanatory variables. Thus endogeneity arising from reverse causality between *FDI* and the stationary explanatory variables is not an empirical issue that drives us to adopt IV or GMM estimation methodologies.[14]

[Insert Table 5 here.]

[11] We should note that the correlation between the first and second components is 0.566, the first and third components is 0.467, and the second and third components is 0.467.

[12] The advantage of the Varimax method is that it minimizes the number of variables, which have high loadings on each factor, and thus helps simplify factor interpretation.

[13] In public administration, the role of bureaucracy in implementing laws and policies and the behavior of elected officials are considered important.

[14] It is possible that endogeneity is a potential issue due to variable omission, nonetheless, which we address in a future version of this paper.

D. Estimation results and robustness checks

Table 6 provides estimation results using the pooled OLS and LSDV estimation methodologies. In all models the *F*-test statistic indicates the joint significance of the explanatory variables at the 1 percent level. Accounting for the unobserved country effects increases R-squared from about 0.28 to 0.82, indicating the importance of the unobserved country-specific effects in explaining the dependent variable. Comparing the R-squared in specifications 2 and 4 suggests that accounting for the unobserved time effects does not add to the explanatory power of the model. We are inclined however to focus on specifications, which account for both country- and time- specific effects since they conceptually capture effects relating to individual countries as well as global events over time, as mentioned in the introduction.

[Insert Table 6 here.]

In specification 4, the coefficient of the first difference of *GDPCAPITA* suggests that an increase in the GDP per capita growth rate by 1 percentage point increases the country's share of world FDI flows by about 0.7 percentage point. This highlights the importance of growth of income levels or market potential to the (relative) competitiveness of countries in attracting FDI at a global scale. In a similar fashion, *POP* and *INFASTRUCTURE* have a positive impact on the share of world FDI flows, indicating the importance of the host country size and infrastructure development to FDI flows in consistence with the literature.

Of the different institutional clusters, *CLUSTER2* or social cohesion has a positive influence on the dependent variable. This influence is positive and statistically significant regardless of the nature of unobserved effects accounted for. Specification 4 suggests that an improvement in social cohesion by 1 standard deviation increases the share of world FDI flows by about one quarter of a percentage point.

Our strategy for robustness checks starts by changing the sampling period for the above (base) model and then extends to model specification. First, we split the sampling period into two: 1984-1998 and 1999-2014. Second, we change the model specification in consistence with the empirical literature and building on the location advantage hypothesis. We first account for FDI flows persistence by including the lagged dependent variable. Then we account for trade openness, domestic investment, and changes in the exchange rate.

In the first half of the sample period (1984-1998), the quality of public administration (*CLUSTER1*) and social cohesion (*CLUSTER2*) do not display statistically significant impact on the share of world FDI flows in specification 4 (Table 7) Their coefficients are significant only in OLS estimates and when controlling for the time effects. In the second half of the sampling period (1999-2014), *CLUSTER2* has positive and statistically significant coefficients in all

specifications (Table 8). Specification 4 shows a coefficient comparable to that in table 6 albeit at 5 percent level.

[Insert Table 7 here.]

[Insert Table 8 here.]

Including the lagged dependent variable in the empirical model does not change the coefficient signs though reduces the coefficient magnitudes and/or statistical significance of some variables (Table 9). The coefficient of the lagged dependent variable suggests persistence in the share of world FDI flows. Having FDI flows a year earlier of 1 percentage point increases the current year's share by slightly above one third of a percentage point. The magnitude of *POP* coefficient is reduced by about one third and its statistical significance drops to the 10 percent level. Coefficient magnitudes for *GDPCAPITA*, *INFRASTRUCTURE*, and *CLUSTER2* drop although their statistical significance remains the same. It is also observed that other institutional clusters do not have an impact on the dependent variable, when accounting for unobservable country effects. *CLUSTER1* shows a positive influence only in (the time effects) specification 3.

[Insert Table 9 here.]

Robustness of the model specification is examined in tables 10-13. In tables 10 and 11, we account for trade openness by including the level of imports of goods and services and the level of exports of goods and services, respectively. Both are measured in constant US$ (log). Since both series are first differenced, estimates indicate that one percentage point increase in imports increases the share of world FDI flows by about one quarter of a percentage point. Export growth has no impact on the dependent variable. In both tables, *CLUSTER2* – social cohesion - has a positive influence on the share of world FDI flows in all four specifications.

[Insert Table 10 here.]

[Insert Table 11 here.]

In table 12, we account for domestic investment, measured in US$ (log). Estimates show no impact on FDI flows. The impact of *CLUSTER2* still holds in all specifications, with coefficient magnitude increasing slightly compared to tables 10 and 11.

[Insert Table 12 here.]

In table 13, we account for changes in the exchange rate. The exchange rate is expressed in terms of period average of the number of local currency units per US$ (log). An increase in value indicates a depreciation/devaluation of the exchange rate. Estimates suggest that a depreciation/devaluation of the exchange rate by one percent increases the share of world FDI flows by nearly one tenth of a percentage point. The positive impact of *CLUSTER2* still holds though with reduced magnitude and statistical significance. *CLUSTER1* – quality of public

administration – now has a positive impact at 5 percent level: Specification 4 indicates that an improvement in the quality of public administration by 1 standard deviation increases the share of world FDI flows by about one tenth of a percentage point.

[Insert Table 13 here.]

6. Conclusion and policy implication

The extant literature on capital flows-institutions nexus has focused on empirically examining the relationship between individual institutions and capital flows. The correlation between the different institutions was largely ignored and thus the unraveling of the influence of individual institutions has been spoiled. In this paper we have dealt with the problem of multicollinearity by using PCA to obtain non-orthogonal components or institutional clusters. Three clusters were extracted: quality of public administration, social cohesion, and stability and property rights protection. Whether these clusters impact the competitiveness of countries to attract FDI flows relative to the world total is empirically examined in this paper. Empirical evidence has shown that the social cohesion cluster has a positive and robust impact, which is a novel result in this literature to the best of our knowledge.

The approach used in this paper to model correlated institutions has hardly been used in the empirical literature. Clustering institutions, using PCA, allows us to have a wider perspective and understanding of their functionality. This understanding can be very useful in designing and undertaking institutional reform programs, an issue we explore in future research.

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Appendix A
Sample Countries – Variable Means

		FDI	Real GDP per Capita	Population	Mobile Subscriptions
		(percent)	(US$ '000)	(million)	(per 100 people)
1	Albania	0.028	6.138	3.1	31.091
2	Algeria	0.083	10.856	30.8	28.050
3	Angola	0.081	4.636	14.0	15.075
4	Armenia	0.023	4.327	3.2	27.125
5	Australia	2.626	35.663	19.0	48.172
6	Austria	0.545	38.336	8.0	61.954
7	Azerbaijan	0.120	8.447	7.9	28.624
8	Bahamas	0.053	23.828	0.3	35.660
9	Bahrain	0.109	42.450	0.7	52.465
10	Bangladesh	0.045	1.820	127.0	14.663
11	Belarus	0.066	9.964	9.9	32.488
12	Belgium	3.619	36.921	10.3	48.965
13	Bolivia	0.057	4.539	8.2	23.801
14	Botswana	0.030	10.937	1.7	37.502
15	Brazil	2.338	11.703	170.0	35.096
16	Brunei	0.063	74.863	0.3	43.705
17	Bulgaria	0.162	11.177	8.2	48.244
18	Burkina Faso	0.005	1.161	11.5	12.086
19	Cameroon	0.035	2.470	15.6	14.844
20	Canada	3.353	36.699	30.4	32.162
21	Chile	0.794	15.428	15.0	41.556
22	China	6.666	5.074	1230.0	23.328
23	Colombia	0.616	9.253	38.9	31.349
24	Congo	0.064	4.995	3.1	24.270
25	Costa Rica	0.105	10.075	3.8	26.403
26	Cote d'Ivoire	0.041	2.974	15.2	23.013
27	Croatia	0.151	17.889	4.5	43.052
28	Cyprus	0.101	27.450	0.9	38.672
29	Czech Republic	0.531	23.006	10.3	54.494
30	Denmark	0.560	40.326	5.3	57.672
31	Dominican Republic	0.111	8.260	8.4	30.728
32	Ecuador	0.088	8.372	12.2	30.155
33	Egypt	0.475	8.168	65.1	27.114
34	El Salvador	0.027	6.308	5.8	39.780
35	Estonia	0.092	18.975	1.4	56.614
36	Ethiopia	0.025	0.761	64.4	4.436
37	Finland	0.436	34.236	5.1	66.370

		FDI	Real GDP per Capita	Population	Mobile Subscriptions
		(percent)	(US$ '000)	(million)	(per 100 people)
38	France	4.098	34.146	61.0	42.584
39	Gabon	0.017	18.083	1.2	43.444
40	Gambia	0.004	1.539	1.2	25.070
41	Germany	3.018	37.108	80.9	50.829
42	Ghana	0.063	2.487	18.6	22.564
43	Greece	0.314	25.709	10.7	50.583
44	Guatemala	0.061	6.296	11.1	36.963
45	Guinea	0.013	1.150	8.3	12.144
46	Guinea-Bissau	0.000	1.435	1.3	12.534
47	Guyana	0.012	4.946	0.8	22.414
48	Haiti	0.004	1.630	8.3	12.998
49	Honduras	0.043	3.749	6.1	27.425
50	Hungary	0.459	19.011	10.3	48.118
51	Iceland	0.054	34.445	0.3	54.916
52	India	0.919	3.019	1010.0	16.053
53	Indonesia	0.616	6.359	205.0	27.156
54	Iran	0.113	12.094	63.6	20.546
55	Iraq	0.059	9.944	23.2	21.041
56	Ireland	0.941	38.201	3.9	51.931
57	Israel	0.379	24.643	6.0	74.358
58	Italy	1.719	34.767	57.5	67.982
59	Jamaica	0.052	8.369	2.5	39.438
60	Japan	0.545	32.672	126.0	46.872
61	Jordan	0.076	8.773	4.5	37.998
62	Kazakhstan	0.500	13.685	15.7	40.211
63	Kenya	0.015	2.297	30.6	17.919
64	Kuwait	0.029	82.218	2.2	49.176
65	Latvia	0.060	14.237	2.4	43.039
66	Lebanon	0.150	12.858	3.4	23.764
67	Liberia	0.035	0.474	2.8	12.131
68	Libya	0.047	24.089	5.0	42.256
69	Lithuania	0.062	15.734	3.4	58.621
70	Luxembourg	0.568	78.743	0.4	66.208
71	Madagascar	0.028	1.425	15.5	9.581
72	Malawi	0.006	0.629	11.3	6.786
73	Malaysia	0.958	16.412	22.5	45.960
74	Mali	0.013	1.365	10.4	20.133
75	Malta	0.120	23.941	0.4	44.518
76	Mexico	2.405	14.393	100.0	27.186

		FDI	Real GDP per Capita	Population	Mobile Subscriptions
		(percent)	(US$ '000)	(million)	(per 100 people)
77	Moldova	0.017	3.424	3.6	25.233
78	Mongolia	0.038	4.940	2.4	27.952
79	Morocco	0.155	5.071	27.8	33.606
80	Mozambique	0.067	0.683	18.1	10.058
81	Namibia	0.032	6.931	1.8	25.128
82	Netherlands	3.266	40.629	15.7	54.658
83	New Zealand	0.344	28.046	3.8	47.067
84	Nicaragua	0.027	3.563	4.9	23.883
85	Niger	0.015	0.827	11.0	7.380
86	Nigeria	0.465	3.665	122.0	16.581
87	Norway	0.577	56.683	4.5	57.576
88	Oman	0.081	42.666	2.2	45.785
89	Pakistan	0.145	3.630	138.0	17.255
90	Panama	0.088	11.265	3.0	46.494
91	Papua New Guinea	0.041	2.006	5.3	7.813
92	Paraguay	0.022	6.381	5.2	32.248
93	Peru	0.328	7.399	25.1	27.407
94	Philippines	0.263	4.635	75.4	30.788
95	Poland	0.683	15.454	38.2	46.083
96	Portugal	0.511	24.907	10.2	54.863
97	Qatar	0.096	122.497	0.8	58.373
98	Romania	0.234	12.892	22.0	36.830
99	Russia	1.812	16.967	145.0	47.915
100	Saudi Arabia	0.832	39.565	20.6	66.380
101	Senegal	0.013	1.969	9.7	20.055
102	Serbia	0.220	9.996	7.5	105.383
103	Sierra Leone	0.001	1.178	4.5	11.015
104	Singapore	2.563	54.573	3.9	70.255
105	Slovakia	0.267	18.296	5.3	43.663
106	Slovenia	0.055	24.985	2.0	47.345
107	South Africa	0.239	10.740	42.1	40.394
108	South Korea	0.793	22.359	45.9	50.866
109	Spain	3.422	29.935	41.5	53.995
110	Sri Lanka	0.042	5.518	18.5	23.456
111	Sudan	0.068	2.631	26.8	14.789
112	Suriname	-0.023	11.683	0.5	39.725
113	Sweden	1.616	37.106	8.9	59.316
114	Switzerland	1.265	49.488	7.2	55.083
115	Tanzania	0.048	1.698	33.5	13.338

		FDI	Real GDP per Capita	Population	Mobile Subscriptions
		(percent)	(US$ '000)	(million)	(per 100 people)
116	Thailand	0.016	10.076	60.9	37.661
117	Togo	0.007	1.256	4.8	12.598
118	Trinidad & Tobago	0.108	21.140	1.3	46.270
119	Tunisia	0.125	7.969	9.2	37.172
120	Turkey	0.504	13.859	61.7	35.908
121	UAE	0.331	96.117	3.8	59.850
122	Uganda	0.029	1.150	24.1	10.787
123	Ukraine	0.277	6.962	49.2	40.425
124	United Kingdom	7.859	32.711	59.2	57.282
125	United States	21.510	45.109	276.0	40.744
126	Uruguay	0.069	13.105	3.2	40.635
127	Venezuela	0.265	15.546	23.7	35.068
128	Vietnam	0.318	3.054	75.1	32.633
129	Yemen	0.032	3.946	16.7	14.900
130	Zambia	0.060	2.623	10.0	14.517

Table 1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
BQ	3970	2.152	1.184	0.00	8.33
C	3970	2.983	1.336	0.00	8.33
DA	3970	3.790	1.673	0.00	6.00
EC	3970	9.670	2.088	0.00	12.00
ET	3970	3.971	1.408	0.00	8.33
GS	3970	7.615	2.118	0.67	12.00
IC	3970	8.823	2.490	0.00	12.00
IP	3970	7.367	2.480	0.00	12.00
LO	3970	3.675	1.454	0.00	6.00
MP	3970	3.753	1.810	0.00	8.33
RP	3970	4.566	1.353	0.00	8.33

Notes: Based on ICRG's 145 countries. BQ: bureaucracy quality. C: Corruption. DA: democratic accountability. ET: ethnic tensions. EC: external conflict. GS: government stability. IC: internal conflict. IP: investment profile. LO: law and order. MP: military in politics. RP: religion in politics.

Table 2: Correlation Coefficients Matrix

	GS	IP	IC	EC	C	MP	RP	LO	ET	DA	BQ
GS	1										
IP	0.550	1									
IC	0.453	0.488	1								
EC	0.321	0.373	0.646	1							
C	0.089	0.251	0.421	0.313	1						
MP	0.224	0.526	0.611	0.460	0.55	1					
RP	0.117	0.212	0.455	0.380	0.32	0.397	1				
LO	0.373	0.472	0.691	0.439	0.61	0.630	0.335	1			
ET	0.295	0.272	0.595	0.389	0.32	0.400	0.398	0.497	1		
DA	0.113	0.463	0.441	0.411	0.51	0.598	0.323	0.447	0.234	1	
BQ	0.225	0.526	0.504	0.380	0.66	0.680	0.267	0.650	0.313	0.615	1

Notes: Based on ICRG's 145 countries. BQ: bureaucracy quality. C: Corruption. DA: democratic accountability. ET: ethnic tensions. EC: external conflict. GS: government stability. IC: internal conflict. IP: investment profile. LO: law and order. MP: military in politics. RP: religion in politics. All correlation coefficients are statistically significant at the 5 percent significance level.

Table 3: Principal Component Analysis of Institutions

	Initial Eigenvalues			Components											
Comp.					Non-rotated				Orthogonal Rotation				Oblique Rotation		
	Total	% Variance	Cumulative Variance %	Institution	1	2	3	Institution	1	2	3	Institution	1	2	3
1	**5.356**	48.692	**48.692**	IC	**0.83**	0.264	0.182	BQ	**0.855**	0.143	0.234	BQ	**0.890**	0.425	0.452
2	**1.296**	11.783	**60.475**	LO	**0.82**	-0.02	-0.03	C	**0.787**	0.268	-0.081	MP	**0.834**	0.587	0.466
3	**1.072**	9.742	**70.217**	MP	**0.82**	-0.21	-0.07	DA	**0.781**	0.155	0.112	DA	**0.799**	0.390	0.322
4	0.745	6.775	76.992	BQ	**0.79**	-0.34	-0.27	MP	**0.735**	0.355	0.227	C	**0.799**	0.460	0.168
5	0.591	5.37	82.363	DA	**0.69**	-0.38	-0.17	LO	**0.605**	0.443	0.341	LO	**0.758**	0.655	0.564
6	0.491	4.467	86.83	C	**0.68**	-0.49	0.026	ET	0.128	**0.767**	0.196	IC	0.624	**0.837**	0.648
7	0.398	3.617	90.447	IP	**0.67**	0.273	-0.49	RP	0.217	**0.750**	-0.114	ET	0.371	**0.795**	0.390
8	0.318	2.889	93.336	EC	**0.67**	0.223	0.207	IC	0.372	**0.689**	0.428	RP	0.388	**0.742**	0.114
9	0.284	2.585	95.921	ET	**0.61**	0.277	0.444	EC	0.273	**0.603**	0.316	EC	0.485	**0.706**	0.500
10	0.243	2.205	98.126	GS	0.46	**0.7**	-0.34	GS	-0.023	0.202	**0.881**	GS	0.207	0.357	**0.873**
11	0.206	1.874	100	RP	0.53	-0.01	**0.58**	IP	0.443	0.078	**0.748**	IP	0.585	0.347	**0.828**

Notes: Based on ICRG's 145 countries. BQ: bureaucracy quality. C: Corruption. DA: democratic accountability. ET: ethnic tensions. EC: external conflict. GS: government stability. IC: internal conflict. IP: investment profile. LO: law and order. MP: military in politics. RP: religion in politics. Varimax method is used for orthogonal rotation, while the Promax method is used for oblique/non-orthogonal rotation. The structure matrix for oblique rotation is shown reflecting the correlation between institutions and extracted components.

Table 4: Augmented Dickey-Fuller Unit Root Test Results

Lags	FDI	*GDPCAPITA*	D1.*GDPCAPITA*	*POP*	*INFRASTRUCTURE*
1	745.1a	183.9	982.4a	748.2a	1184.0a
2	448.6a	177.8	714.1a	1228.2a	1222.4a
3	345.9a	226.9	495.8a	389.2a	1362.4a
4	322.5a	182.7	548.3a	444.1a	1749.2a
5	395.6a	171.7	363.7a	394.7a	1186.3a
Lags	*CLUSTER1*	*CLUSTER2*	*CLUSTER3*	*D1.CLUSTER3*	
	Orthogonally rotated				
1	350.7a	446.0a	317.6b	1718.6a	
2	314.1b	409.4a	291.6	941.2a	
3	341.1a	485.4a	287.9	757.9a	
4	358.5a	453.8a	327.3b	506.8a	
5	375.0a	425.4a	424.6a	490.6a	
	Non-orthogonally rotated				
1	393.9a	406.5a	307.0c	1737.9a	
2	360.9a	396.8a	289.2	925.6a	
3	391.9a	468.9a	300.6	719.0a	
4	403.3a	469.5a	310.8c	466.4a	
5	453.1a	486.2a	372.7a	393.4a	

Notes: a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively.

Table 5: Granger-causality Test Results

Null Hypothesis: *FDI* does not Granger-cause the explanatory variable

	Obs.	F-Statistic	Prob.
D.*GDPPERCAPITAPPP*	2641	0.379	0.685
POP	3657	0.179	0.836
INFRASTRUCTURE	2896	0.271	0.763
CLUSTERS - Orthogonally rotated			
CLUSTER1	3798	1.232	0.292
CLUSTER2	3798	0.081	0.922
D.CLUSTER3	3678	0.590	0.555
CLUSTERS - Non-orthogonally rotated			
CLUSTER1	3798	0.356	0.701
CLUSTER2	3798	0.327	0.721
D.CLUSTER3	3678	0.974	0.378

Notes: Test is based on 2 lags.

Table 6: OLS and LSDV Estimation Results

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
D. *GDPCAPITA*	0.165	**0.623a**	0.333	**0.697a**
	(0.470)	(0.226)	(0.514)	(0.246)
POP	**0.603a**	0.087	**0.607a**	**0.329b**
	(0.045)	(0.100)	(0.046)	(0.131)
INFRASTRUCTURE	**0.046a**	0.015	**0.133a**	**0.044b**
	(0.017)	(0.011)	(0.031)	(0.019)
CLUSTER1	**0.659a**	0.060	**0.597a**	0.083
	(0.055)	(0.058)	(0.053)	(0.058)
CLUSTER2	**0.345a**	**0.222a**	**0.347a**	**0.243a**
	(0.048)	(0.049)	(0.046)	(0.056)
D.*CLUSTER3*	0.055	-0.013	0.032	-0.008
	(0.111)	(0.055)	(0.119)	(0.063)
Constant	-9.302a	-1.418	-9.883a	-5.218a
	(0.723)	(1.476)	(0.807)	(2.016)
Observations	2,685	2,685	2,685	2,685
R-squared	0.276	0.820	0.283	0.821
F-test	**41.29a**	**25.34a**	**10.61a**	**22.34a**

Notes: *D* indicates the first difference. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 7: Robustness Checks – Sampling Period
Sub-sample period (1984-1998)

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
D. *GDPCAPITA*	**3.524a**	0.713	**3.885a**	**0.942c**
	(1.311)	(0.459)	(1.338)	(0.518)
POP	**0.643a**	0.359	**0.645a**	1.239
	(0.086)	(0.669)	(0.086)	(1.156)
INFRASTRUCTURE	0.037	-0.058b	0.058	**-0.047c**
	(0.056)	(0.026)	(0.052)	(0.026)
CLUSTER1	**0.837a**	0.067	**0.756a**	0.075
	(0.136)	(0.118)	(0.138)	(0.122)
CLUSTER2	**0.176b**	0.023	**0.269a**	0.067
	(0.086)	(0.084)	(0.089)	(0.077)
D.*CLUSTER3*	-0.101	0.081	-0.043	0.107
	(0.183)	(0.075)	(0.178)	(0.080)
Constant	-9.915a	-5.344	-9.744a	-18.454
	(1.375)	(9.996)	(1.426)	(17.112)
Observations	768	768	768	768
R-squared	0.282	0.908	0.289	0.908
F-test	16.98a	.	8.35a	.

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 8: Robustness Checks – Sampling Period
Sub-sample period (1999-2014)

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
D. *GDPCAPITA*	**-0.877c**	0.339	**-1.051c**	0.214
	(0.527)	(0.229)	(0.565)	(0.215)
POP	**0.589a**	-0.092	**0.594a**	**0.342c**
	(0.054)	(0.158)	(0.054)	(0.190)
INFRASTRUCTURE	**0.074a**	**0.047a**	**0.204a**	**0.135a**
	(0.016)	(0.011)	(0.037)	(0.033)
CLUSTER1	**0.592a**	0.074	**0.523a**	0.107
	(0.062)	(0.109)	(0.058)	(0.107)
CLUSTER2	**0.372a**	**0.315a**	**0.323a**	**0.231b**
	(0.058)	(0.100)	(0.055)	(0.095)
D.*CLUSTER3*	0.140	-0.067	0.087	-0.087
	(0.147)	(0.076)	(0.159)	(0.082)
Constant	-9.160a	1.130	-9.962a	-5.781b
	(0.837)	(2.350)	(0.941)	(2.938)
Observations	1,917	1,917	1,917	1,917
R-squared	0.277	0.801	0.283	0.802
F-test	35.59a	20.47a	12.11a	17.39a

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 9: Robustness Checks – Model Specification
Inclusion of FDI Persistence

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
L.*FDI*	**0.827a**	**0.367a**	**0.825a**	**0.364a**
	(0.041)	(0.062)	(0.041)	(0.063)
D. *GDPCAPITA*	**0.542b**	**0.600a**	**0.616b**	**0.658a**
	(0.250)	(0.225)	(0.267)	(0.230)
POP	**0.103a**	0.032	**0.105a**	**0.220c**
	(0.017)	(0.085)	(0.017)	(0.112)
INFRASTRUCTURE	0.012	0.013	**0.035a**	**0.036b**
	(0.008)	(0.009)	(0.013)	(0.016)
CLUSTER1	**0.092a**	0.057	**0.079b**	0.072
	(0.029)	(0.051)	(0.031)	(0.049)
CLUSTER2	**0.068a**	**0.148a**	**0.064a**	**0.158a**
	(0.025)	(0.047)	(0.025)	(0.053)
D.*CLUSTER3*	0.025	-0.006	0.018	-0.005
	(0.054)	(0.051)	(0.060)	(0.057)
Constant	-1.612a	-0.574	-1.533a	-3.163c
	(0.267)	(1.251)	(0.314)	(1.636)
Observations	2,678	2,678	2,678	2,678
R-squared	0.792	0.846	0.792	0.846
F-test	**155.08a**	**33.38a**	**65.11a**	**30.88a**

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 10: Robustness Checks – Model Specification
Inclusion of FDI Persistence and Imports

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
L.*FDI*	**0.816a**	**0.338a**	**0.815a**	**0.333a**
	(0.045)	(0.067)	(0.045)	(0.067)
D. *GDPCAPITA*	0.092	**0.455c**	0.104	**0.457c**
	(0.223)	(0.259)	(0.235)	(0.276)
POP	**0.097a**	-0.123	**0.098a**	0.120
	(0.017)	(0.122)	(0.017)	(0.142)
INFRASTRUCTURE	0.014	**0.021b**	**0.039b**	**0.051a**
	(0.009)	(0.011)	(0.016)	(0.019)
D.*IMPORTS*	**0.275a**	**0.194b**	**0.319a**	**0.240a**
	(0.090)	(0.083)	(0.086)	(0.080)
CLUSTER1	**0.118a**	0.026	**0.106a**	0.057
	(0.032)	(0.056)	(0.035)	(0.055)
CLUSTER2	**0.051b**	**0.158a**	**0.047b**	**0.173a**
	(0.023)	(0.053)	(0.023)	(0.058)
D.*CLUSTER3*	0.020	-0.005	0.008	-0.005
	(0.061)	(0.057)	(0.066)	(0.063)
Constant	-1.540a	1.700	-1.468a	-1.631
	(0.261)	(1.801)	(0.319)	(2.074)
Observations	2,343	2,343	2,343	2,343
R-squared	0.776	0.836	0.777	0.836
F-test	**107.08a**	**33.50a**	**49.37a**	**28.80a**

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 11: Robustness Checks – Model Specification
Inclusion of FDI Persistence, Imports, and Exports

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
L.*FDI*	**0.816a**	**0.338a**	**0.815a**	**0.333a**
	(0.045)	(0.067)	(0.045)	(0.067)
D. *GDPCAPITA*	0.227	**0.572b**	0.233	**0.567c**
	(0.241)	(0.270)	(0.264)	(0.291)
POP	**0.097a**	-0.121	**0.099a**	0.126
	(0.017)	(0.122)	(0.017)	(0.143)
INFRASTRUCTURE	0.014	**0.020c**	**0.038b**	**0.051a**
	(0.009)	(0.011)	(0.016)	(0.019)
D.*IMPORTS*	**0.327a**	**0.230a**	**0.367a**	**0.271a**
	(0.094)	(0.083)	(0.099)	(0.088)
D.*EXPORTS*	-0.168	-0.138	-0.165	-0.134
	(0.105)	(0.097)	(0.105)	(0.097)
CLUSTER1	**0.118a**	0.025	**0.106a**	0.056
	(0.032)	(0.056)	(0.035)	(0.055)
CLUSTER2	**0.051b**	**0.159a**	**0.047b**	**0.173a**
	(0.023)	(0.053)	(0.023)	(0.058)
D.*CLUSTER3*	0.018	-0.007	0.006	-0.006
	(0.062)	(0.057)	(0.066)	(0.063)
Constant	-1.539a	1.679	-1.469a	-1.708
	(0.261)	(1.805)	(0.319)	(2.087)
Observations	2,343	2,343	2,343	2,343
R-squared	0.776	0.836	0.777	0.836
F-test	95.69a	32.94a	47.85a	28.41a

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 12: Robustness Checks – Model Specification
Inclusion of FDI Persistence, Imports, Exports and Domestic Investment

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
L.*FDI*	**0.815a**	**0.338a**	**0.813a**	**0.333a**
	(0.045)	(0.067)	(0.045)	(0.067)
D. *GDPCAPITA*	0.262	**0.778b**	0.279	**0.794b**
	(0.333)	(0.352)	(0.349)	(0.370)
POP	**0.102a**	-0.169	**0.103a**	0.126
	(0.017)	(0.154)	(0.018)	(0.183)
INFRASTRUCTURE	0.014	**0.023c**	**0.040b**	**0.053a**
	(0.010)	(0.012)	(0.017)	(0.020)
D.*IMPORTS*	**0.284b**	**0.215b**	**0.315b**	**0.252b**
	(0.115)	(0.102)	(0.123)	(0.112)
D.*EXPORTS*	-0.145	-0.132	-0.142	-0.112
	(0.119)	(0.110)	(0.115)	(0.105)
D.*INVESTMENT*	0.089	0.039	**0.107c**	0.056
	(0.054)	(0.047)	(0.058)	(0.053)
CLUSTER1	**0.125a**	0.028	**0.112a**	0.061
	(0.034)	(0.059)	(0.037)	(0.058)
CLUSTER2	**0.052b**	**0.167a**	**0.047c**	**0.180a**
	(0.025)	(0.055)	(0.024)	(0.061)
D.*CLUSTER3*	0.019	-0.010	0.009	-0.005
	(0.067)	(0.062)	(0.073)	(0.070)
Constant	-1.619a	4.504	-1.548a	-1.306
	(0.277)	(3.205)	(0.333)	(3.761)
Observations	2,153	2,153	2,153	2,153
R-squared	0.775	0.834	0.775	0.835
F-test	83.12a	33.0a	45.15a	28.38a

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.

Table 13: Robustness Checks – Model Specification
Inclusion of FDI Persistence, Imports, Exports, Domestic Investment and Exchange Rate

	(1)	(2)	(3)	(4)
VARIABLES	OLS	Country Effects	Time Effects	Country & Time Effects
L.*FDI*	**0.860a**	**0.362a**	**0.860a**	**0.358a**
	(0.048)	(0.091)	(0.048)	(0.091)
D. *GDPCAPITA*	**0.509c**	**0.742b**	0.484	**0.809b**
	(0.283)	(0.307)	(0.315)	(0.337)
POP	**0.078a**	**-0.225c**	**0.079a**	-0.058
	(0.016)	(0.130)	(0.016)	(0.168)
INFRASTRUCTURE	0.014	**0.017c**	**0.025c**	**0.032b**
	(0.010)	(0.009)	(0.015)	(0.016)
D.*IMPORTS*	**0.303a**	**0.251a**	**0.255b**	**0.243b**
	(0.106)	(0.096)	(0.109)	(0.103)
D.*EXPORTS*	-0.079	-0.110	-0.105	-0.111
	(0.104)	(0.097)	(0.108)	(0.100)
D.*INVESTMENT*	0.077	0.044	**0.090c**	0.045
	(0.047)	(0.039)	(0.051)	(0.045)
EXCHANGE	**-0.019a**	**0.056b**	**-0.018a**	**0.081b**
	(0.005)	(0.026)	(0.005)	(0.039)
CLUSTER1	**0.067b**	**0.086b**	**0.061b**	**0.104b**
	(0.029)	(0.040)	(0.030)	(0.043)
CLUSTER2	**0.043b**	**0.079c**	**0.040c**	**0.086c**
	(0.022)	(0.048)	(0.021)	(0.050)
D.*CLUSTER3*	0.018	-0.006	0.001	-0.009
	(0.064)	(0.059)	(0.068)	(0.064)
Constant	-1.208a	5.293c	-1.267a	1.677
	(0.248)	(2.709)	(0.271)	(3.598)
Observations	1,928	1,928	1,928	1,928
R-squared	0.839	0.883	0.841	0.884
F-test	82.23a	34.89a	51.08a	29.91a

Notes: L and D indicate the first lag and difference, respectively. Robust standard errors are in parentheses. a, b, and c indicate statistical significance at the 1, 5, and 10 percent levels, respectively. Estimated coefficients of country and time dummies are not included for brevity.