Research methods in economics and its implications for capital formation

Waqar Ameer, Helian Xu, Kazi Sohag, Musaad Mansoor Halwan & Azka Amin

Published online: 25 Mar 2022.

Submit your article to this journal ☑

Article views: 666

View related articles ☑

View Crossmark data ☑

Citing articles: 1 View citing articles ☑

Routledge
Taylor & Francis Group

Research methods in economics and its implications for capital formation

Waqar Ameer[a,b], Helian Xu[b], Kazi Sohag[c] , Musaad Mansoor Halwan[b] and Azka Amin[d]

[a]School of Economics, Shandong Technology and Business University, Shandong, Yantai, P.R. China; [b]School of Economics and Trade, Hunan University, Yuelushan, Changsha, Hunan, China; [c]Graduate School of Economics and Management, Ural Federal University, Ekaterinburg, Russia; [d]Department of Business Administration, Iqra University, Karachi, Pakistan

ABSTRACT

We explore whether public or private capital augments or obstruct Foreign Direct Investment (FDI) inflows by decomposing Domestic Capital Formation (DCF) into private and public capital formation. To this end, we apply Cross-Sectional Autoregressive Distributed Lags (CS-ARDL) approach to analyze panel time-series data. Our empirical results show that public capital crowds in FDI inflows while private capital crowds out FDI inflows. However, institutional quality significantly attracts FDI inflows for less developing economies. We argue that private and public capital possess different attributes; thus, clubbing them together might result in aggregation bias. We observe a strong connection of good institutional quality with private and public capital to augment foreign capital inflows for developing countries in the long run. Besides, our empirical results suggest that returns are high with quality institutions, especially for developing regions. Our result estimations provide several policy implications.

1. Introduction

Foreign capital inflow is a dynamic conduit of technology transfer from developed to developing countries. Developing countries often encounter insufficient domestic capital savings; thus, FDI inflow fulfils the required amount of domestic investment. The literature argues that FDI contributes toward the prosperity and socio-economic development of the less developing economies (Ndikumana & Verick, 2008). FDI is the prime vector of technological diffusion, productivity enrichment and job creation in developing and transition economies. Besides, FDI fosters the process of globalization; eventually, it promotes economic development in the less developing nations (Quazi, 2007; Smith, 1997). In real terms, foreign capital flows increased by roughly 6% annually in the last four decades, higher than the world's GDP growth rate (Ju &

Wei, 2007). According to the UNCTAD report, FDI inflows increased by twenty-nine percent in 2005 and reached the digits of nine hundred sixteen billion US dollars[1]. FDI inflows significantly increased in the case of developing countries in the last couple of decades (Ndikumana & Verick, 2008).

FDI inflows realize the rising investment needs for rapid economic development in the developing economies (North, 1981, 1990). In addition, prior literature highlights the promising role of institutional quality to accrue economic gains from foreign capital inflows (OECD, 2002). Empirical and theoretical studies emphasized the role of institutional quality in attracting foreign capital inflows in the last couple of decades (Acemoglu & Johnson, 2005; IMF, 2003). Institutional quality is also associated with economic growth (Ali et al., 2010; North, 1990). Evidence shows that Russia experienced less inflow of FDI due to slowdown of institutional reform[2]. In addition, The Economist claims that poor institutional quality reduces the pace of socio-economic development and research and development activities[2] (The Economist, 2003).

Existing literature clarified different possible ways utilizing those channels the institutions influence international capital flows. Three crucial factors are highlighted, focusing on the significance of institutions in promoting foreign capital inflows (Ali et al., 2010; Buchanan et al., 2012). Firstly, North (1990) emphasized the role of institutional quality in stimulating investment and economic development. Secondly, developing and transition economies firmly focused on restructuring the institutions to attract FDI inflows due to the rapid increase of foreign capital flows in the last two decades. Thirdly, overseas investors keenly focus on the quality of institutions of the host country while deciding in which country to invest (Bevan et al., 2004). Institutions are designed to minimize and curtail the risk associated with business transactions and human exchange (North, 1990). Furthermore, North (1990) explains that parties have insufficient information about the true intentions of their business partner due to asymmetric available in the financial market.

There are different theoretical views regarding the nexus between public and private capital formation. The traditional economist claims that public capital obstructs private capital due to increased public expenditure and decreased tax collection, leading to a budget deficit. Thus, public capital sponsored by public borrowings hikes the interest rate and reduces productivity, resulting in a decrease of private capital formation in the local economy (Ameer et al. 2020; Şen & Kaya, 2014; Mohanty, 2018). In contrast, according to the Keynesian perspective, an increase in public expenditure stirs and crowds in domestic economic activities and, resultantly, stimulates private capital in the economy. In addition, the new-classical theory claims that public expenditure would neither stimulate nor impede private investment because budget deficit occurs owing to an increase in public spending and, thus, increase in the level of public spending cannot alter interest rate, therefore; it cannot influence private investment (Bernheim, 1989).

The classical theory claims that private and public capital formation typically crowds out each other (Şen & Kaya, 2014; Mohanty, 2018). Literature regards the derive of private and public investment very differently (Mohanty, 2018; Narayan, 2004; Şen & Kaya, 2014; Shah et al., 2020). In general, private and public capital formations repel and resist each other (Şen & Kaya, 2014; Mohanty, 2018). Consequently, thus, accumulating them into one composite term may cause domestic

capital formation aggregation bias. A study of Amighini et al. (2017) explored the reverse causality impact of FDI inflows on gross fixed capital formation for developing countries. Also, this study has not considered the idea of bifurcation of aggregate capital formation. Henceforth, the prior studies, such as Buchanan et al. (2012) and Huynh et al. (2020), explored the impact of institutional quality (IQ) and aggregate gross domestic capital (DCF) on foreign direct investment inflows (FDI) for panel data studies but these studies also ignored the idea of bifurcation of aggregate domestic capital formation (DCF) into private and public capital formation in order to control domestic capital aggregation bias. In addition, these studies also ignored the common correlation bias which generally exists in the time series panel data studies. Although, a study of Shah et al. (2020) and Ameer et al. (2021) considered the idea of bifurcation by decomposing aggregation capital formation into private and public capital but these studies explored the reverse causality impact of FDI inflow and FDI outflow on domestic capital formation. In addition, these studies of Shah et al. (2020) and Ameer et al. (2021) particular focused on GCC regions but not specially developing regions.

Best to our knowledge, this is the first study particulary for developing countries which has addressed the issue of aggregation bias by exploring impact of aggregate capital formation on FDI inflows by decomposing aggregate capital formation into private and public capital formation. Thus, we contribute to the existing literature by decomposing aggregation capital formation into private and public capital to measure the distinct impact of private and public capital formation on foreign capital inflows (FDI) respectively to avoid aggregation domestic capital formation bias. Overall, this empirical work adds to the existing research literature on many fronts. First of all, we explore interaction effects (DCF*IQ) of aggregate domestic capital formation (DCF) and institutional quality in promoting FDI. Next, we measure interaction effects (PRI*IQ) of private capital formation and institutional quality (IQ) on FDI. We use the novel concept of CS-ARDL to hold for endogeneity and common correlation bias issues in the developing and transition regions and get consistent results. Besides, we examine interaction effects (PUBI*IQ) of public capital formation and institutional quality (IQ) in stimulating IFDI. In addition, we investigate combined interaction effects (PRI*PUBI*IQ) of institutional quality, private and public capital formation instantaneously on FDI for developing countries. Also, we have formulated a comprehensive index of institutional quality to capture the effects of all crucial individual governance indicators extensively into one aggregate component by aggregating six key individual governance indicators into one aggregate institutional index. Finally, many previous studies have ignored cross-sectional dependency issues to explore the impact of domestic capital formation and institutional quality on FDI inflows.

Section 2 explains the literature review. The third section of our empirical study comprises of methodology, data collection and source of a dataset. The fourth section of our empirical study sheds light on result estimations and their elaboration. Section five concludes our paper.

2. Literature review

Existing empirical research intensely emphasized institutional quality's effects on FDI inflows (Ali et al., 2010; Buchanan et al., 2012). MNCs preferences are changing from

resource and market seeking to efficiency-seeking; thus; consequently, good governance and economic freedom have emerged as rising determining factors of FDI in the last decades (Dunning, 2002). Non-traditional determinants of FDI inflows, for instance; good governance and economic freedom, are emerging more serious determining factors of foreign capital inflows in the recent decades while more traditional FDI determining factors, such as low labour costs and natural resources, are deemed to less valuable compare to the traditional determinants of foreign capital flows in the recent era (Addison & Heshmati, 2003; Becchetti & Hasan, 2004; Noorbakhsh et al., 2001). MNCs also consider law and order situation seriously while investing abroad when courts cannot enforce the contracts successfully. Public officials easily approach the courts to influence political decisions (Drabek & Payne, 2002). Property rights protection, sound political environment and control of corruption are critical institutional indicators to attract multinational investments in developing countries (Jensen, 2003; Richards & Nwankwo, 2005). In the case of seventeen Latin American countries, Judicial competency and supremacy of the rule of law attract foreign capital inflows (Staats & Biglaiser, 2012).

The quality of institutions assesses the risk premium. The risk premium is influenced by the protection of property rights issues, enforceability of the contract, and probability of the third party (North, 1990). In addition, some scholars argue that multinational corporations (MNCs) face expropriation risks in those countries where protection of property rights are pretty poor (Henisz, 2000; Henisz & Williamson, 1999). Survey investment reports claim that corruption impedes foreign capital inflows (Asiedu & Villamil, 2000; Gastanaga et al., 1998). Overall, more corrupt countries receive lesser foreign capital inflows. The lower level of corruption index attracts FDI inflows in the host country (Cuervo-Cazurra, 2006, 2008). Strong protection of property rights attracts foreign capital inflows, mainly; when other institutional factors influence foreign capital inflows indirectly through property rights protection (Ali et al., 2010). Quality institutions minimize running business and production costs (North, 1990) and thus, consequently, flourish as well as upsurge business activities; however, weak institutional structure increases risk premium, running business costs, and production costs (Cuervo-Cazurra, 2006, 2008).

Good governance has higher returns for developing countries if we compare it with that of other countries in their study sample (Globerman & Shapiro, 2002). The principal opinion is that countries with solid institutional quality can attract more FDI inflows (Gani, 2007; Globerman & Shapiro, 2002) whereas bad institutions cannot protect the investments (Globerman & Shapiro, 2003). Quality institutions attract FDI inflows while bad institutional quality impedes FDI inflows. Weak institutional quality upsurges all types of investment uncertainties, including FDI inflows (Ali et al., 2010). Also, Buchanan et al. (2012) explored the impact of institutions and domestic capital formation on FDI inflows for a large panel of 164 countries and concluded that quality institutions attract FDI inflows. Jude and Levieuge (2013) concluded that lack of institutional structure is the cause of lower per capita income, lower productivity, sluggish investment opportunities and lower economic growth. Peres et al. (2018) concluded that institutional quality positively stimulates FDI inflows for developed countries and its effects are neutral in the case of developing

countries. In addition, governance indicators, such as control of corruption and the rule of law, are significant institutional indicators to stimulate foreign capital inflows.

Quite lot of empirical studies concluded that public capital formation positively stimulates private capital formation in the case of developed and developing economies (Andrade & Duarte, 2016; Ang, 2009). In contrast, a lot of empirical research studies refuted the arguments that public capital formation stirs private capital formation and found unconditionally different empirical findings that public investment crowds out private investment (Atabaev et al., 2018; Mountford & Uhlig, 2005; Xu & Yan, 2014). Conversely, some empirical studies claimed that there exists a neutral relationship between private capital and public spending (Kollamparambil & Nicolaou, 2011; Narayan, 2004) or stimulates each other in the short-run and they obstruct each other in the long-run (Nguyen & Trinh, 2018). Scholars and policy makers worldwide keenly focused and paid lot of attention to this theoretical idea. The empirical justification of this theory significantly differs in views (Andrade & Duarte, 2016; Ang, 2009). Henceforth, a study of Argimon et al. (1997) explored nexus between public expenditure and private expenditure for fourteen OECD states. Their empirical evidence suggest that public capital stimulates or crowds in private investment because of positive effect of infrastructure on private capital efficiency (Argimon et al., 1997). In addition, a study of Mahmoudzadeh et al. (2013) comprise of 23 developed and 15 developing economies; they concluded that public capital impedes private capital for developed economies and the public capital stimulates private capital in case of developing economies (Mahmoudzadeh et al., 2013).

As per above discussed empirical literature, we infer that only studies of Buchanan et al. (2012) and Huynh et al. (2020) have studied impact of aggregate domestic capital (DCF) on FDI infows for developed or developing countries but these studies have not considered idea of decomposition of aggregate domestic capital formation. Additionally, we find that few of existing studies, such as Ameer et al. (2021) and Shah et al. (2020), explored the reverse causality impact of FDI outflows and inflows simultaneously on DCF by bifurcation of aggregate capital formation in to private and public capital and these two studies particularly focused on GCC region but not developing regions. After reading the relevant literature, we have contributed to the existing literature by addressing the issue of aggregation bias by exploring the impact of aggregate domestic capital formation on FDI inflows by decomposing aggregate capital formation into private and public capital formation particularly in case of developing countries. This paper aims at specifically filling this gap.

3. Methodology and data

Our empirical study includes a comprehensive panel of seventy-three (73) developing and transition economies from 1996 to 2017 annually. For developing countries, we have cross-country studies. i.e., ($N \leq 73$) and several years i.e., ($T \leq 23$) in our study. There is a possibility of common correlation bias (CD) when cross-section (N) is relatively larger than number of years (T). It is possible that FDI inflows by one developing country can influence the FDI inflows of other developing economies. Also, when we have a large cross-section and relatively less time span ($N>T$), it is highly

expected that institutional structure of one developing country depend or influenced by other's developing countries institutional policy structure due to the rising wave of globalization and technology advancement. Developing economies are strongly interconnected with each other and follow mutual economic as well as cultural policies, thus; probability of cross-sectional dependency in particular case of developing countries is quite high. Henceforth, cross-sectional dependency bias issues usually occur in the cross-country panel dataset due to spill-over effects, omitted variable bias and mutual interconnectedness with in socio-economic network (Pesaran & Tosetti, 2011). We test our null hypothesis that there does not exist cross-sectional dependency issues in our variables of study against the alternative hypothesis of cross-sectional dependence. Our empirical work follows the methods of Pesaran (2004).

$$CD = \left(\frac{TN(N-1)}{2}\right)^{1/2} \overline{\hat{\rho}} \qquad (1)$$

where $\overline{\hat{\rho}} = \left(\frac{2}{N(N-1)}\right)\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}$. The $\hat{\rho}_{ij}$ denotes the pair-wise common correlation coefficient of the residuals which is derived from ADF regression. N and T denote for cross-section and time dimensions, respectively. We have reported and clarified our baseline model regression equations as following:

$$FDI_{it} = \alpha_i + \beta_{i1}DCF_{it} + \beta_{i2}IQ_{it} + \varepsilon_{it} \qquad (2)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PRI_{it} + \beta_{i2}IQ_{it} + \varepsilon_{it} \qquad (3)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PUBI_{it} + \beta_{i2}IQ_{it} + \varepsilon_{it} \qquad (4)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PRI_{it} + \beta_{i2}PUBI_{it} + \beta_{i3}IQ_{it} + \varepsilon_{it} \qquad (5)$$

whereas $i = 1 \dots \dots i$, which signifies cross-sectional dimension; and $t = 1 \dots \dots t$ represent period and αi denotes country-specific effects. PRI stands for private capital formation, and PUBI denotes public capital formation. To gauge the effects of DCF and IQ on FDI inflows more precisely and accurately, control variables are added to equations (2,3,4 & 5), respectively. The selection of explanatory or control variables is based on current empirical literature and is symbolized by 'x'. Our extended models are reported as:

$$FDI_{it} = \alpha_i + \beta_{i1}DCF_{it} + \beta_{i2}IQ_{it} + \beta_{i3}X + \varepsilon_{it} \qquad (6)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PRI_{it} + \beta_{i2}IQ_{it} + \beta_{i3}X + \varepsilon_{it} \qquad (7)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PUBI_{it} + \beta_{i2}IQ_{it} + \beta_{i3}X + \varepsilon_{it} \qquad (8)$$

$$FDI_{it} = \alpha_i + \beta_{i1}PRI_{it} + \beta_{i2}PUBI_{it} + \beta_{i3}IQ_{it} + \beta_{i3}X + \varepsilon_{it} \qquad (9)$$

The extended models in equations (6,7,8 & 9) follow the same characteristics of error terms and coefficients of our baseline models reported in equations (2,3,4&5). Henceforth, we have added additional explanatory variables such as interactive proxy variables (DCF*IQ) or (PRI*IQ) or (PUBI*IQ) or (PRI*PUBI*IQ) and inflation rate (INFLATION) in equations (6,7,8 & 9) respectively to measure the impact of DCF and IQ on FDI inflows more accurately and have a robust check of our empirical findings of our baseline models. Equation (6) captures the effects of DCF, IQ and other control variables on foreign capital inflows. Equation (7) captures the effects of private capital formation, IQ and other control variables on foreign capital inflows. Equation (8) captures the impact of public capital formation, IQ and other control variables on foreign capital inflows. Also, Equation (9) captures the simultaneous impact of PRI, PUBI, IQ and other control variables on foreign capital inflows for developing countries.

3.1. Panel CS-ARDL and unit-root test methods

The traditional panel unit root test methods consider cross-sectional independence across the time series units (Im et al., 2003; Levin et al., 2002; Maddala & Wu, 1999). However, the newly introduced panel unit root test methods not only solve the issue of common correlation effect bias (CD) cross the units but they also control the structural breaks issues that usually exist in the time series panel dataset (Bai & Ng, 2004; Choi, 2006; Moon & Perron, 2004; Pesaran, 2007; Smith et al., 2004). To control cross-sectional dependency biases in the variables of our study, we have applied cross-sectional augmented Dickey-Fuller (CADF) Panel unit root test, which is reported in Equation (10):

$$\Delta y_{it} = \alpha_i + Kit_i + \beta_i y_{it-1} + \gamma_i \overline{y}_{t-1} + \phi_i \Delta \overline{y}_t + \varepsilon_{it} \qquad (10)$$

Where as $t = 1, \ldots, T$, $i = 1, \ldots, N$ and $\overline{y}_t$ denotes the cross-sectional mean of y_{it} which is derived from $\overline{y}_t = N^{-1} \sum_{i=1}^{N} y_{it}$. The study of Pesaran (2007) provides the cross-sectional augmented panel unit root (CIPS) test statistic as reported in Equation (11):

$$CIPS(N, T) = N^{-1} \sum_{i=1}^{N} t_i(N, T) \qquad (11)$$

$t_i(N, T)$ in Equation (7) signifies t-statistic for β_i. After applying the CD test among the set of variables individually, we found common correlation effects (CD) among the units. Henceforth, it is best fitted and suitable to apply CS-ARDL methods for this empirical study which is reported in Equation (12).

$$\Delta Y_{it} = \mu_i + \varphi_i(Y_{it-1} - \beta_i X_{it-1} - \phi_{1i}\overline{Y}_{t-1} - \phi_{2i}\overline{X}_{t-1}) + \sum_{j=1}^{p-1} \lambda_{ij}\Delta Y_{it-j}$$

$$+ \sum_{j=0}^{q-1} \zeta_{ij}\Delta X_{it-j} + \eta_{1i}\Delta \overline{Y}_t + \eta_{2i}\Delta \overline{X}_t + \varepsilon_{it} \qquad (12)$$
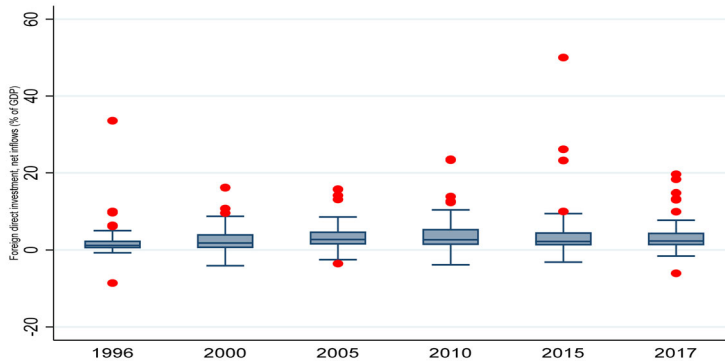
Figure 1. Trend of foreign direct investment.
Source: Author's Calculations/Estimations.

Y_{it} stands for FDI (dependent variable), μi stands for intercept, $β_{it}$ denotes the value of the coefficients of explanatory variables and lagged explanatory variables. Xit (DCF or {PRI + PUBI}, IQ, DCF^x IQ or PRI^x IQ or $PUBI^x$ IQ or PRI^x $PUBI^x$ IQ and INFLATION) is the vector of explanatory variables. Where $φ_i$ stands for error correction term (ecm) that explains adjustment of short-run disequilibrium after economic shock towards long-run equilibrium. $\overline{Y}_{t-1}$ denotes unobserved temporal factors of lagged dependent variable in the long run and $\overline{X}_{t-1}$ stands for unobserved temporal factors of lagged independent variables in the long run while $\Delta\overline{Y}_t$ and $\Delta\overline{X}_t$ In the short run, denote unobserved temporal factors for dependent and explanatory variables, which is reported in the above paragraph in Equation (12).

3.2. Data description and source

Foreign capital inflows (%GDP) is the dependent variable while DCF, IQ and other control variables are explanatory variables of our empirical study. Figure 1 reports the distribution of FDI inflows across our sample countries and over time.

The key solution is to sum all the individual governance indexes into one aggregate composite term which denotes all six individual governance indicators in to one aggregate index (Daude & Stein, 2007). Accordingly, we have applied principal component analysis (PCA) methodology, termed it 'institutional quality'. We are considering six individual governance indicators[3] to formulate composite index of institutional quality. Governance indicators are normally highly correlated with each other, it might cause multicollinearity among the individual institutional indicators and might reduce the extent to which the relevance of each individual governance indicator can be measured (Mauro, 1995). Table 1 reports our variables, definitions and sources.

4. Results and discussion

4.1. Descriptive statistics

The results are reported in Table 2. For developing countries, the mean value of DCF (%GDP) is 23.69. The mean value of PUBI (% GDP) is 10.24, while the mean value

Table 1. Variables, theoretical justifications and data sources.

Variable	Description	Theoretical justification	Source
FDI	Foreign Capital Inflows	FDI is a crucial channel of technology transfer from technologically advanced to developing countries (Ndikumana & Verick, 2008).	WDI
PRI	Private Capital Formation	Lot of empirical studies found evidence that public capital crowds out private investment activities (Atabaev et al., 2018; Mountford & Uhlig, 2005; Xu & Yan, 2014).	IMF Fiscal Affairs Department
PUBI	Public Capital Formation	The traditional economist claims that public capital obstructs private capital due to an increase in public expenditure and a decrease in tax collection, giving rise to budget deficit (Mohanty, 2018; Narayan, 2004; Şen & Kaya, 2014). In contrast, according to the Keynesian perspective, an increase in public expenditure stirs and crowds in domestic economic activities and, resultantly, stimulates private capital in the economy (Bernheim, 1989).	IMF Fiscal Affairs Department
INFLATION	GDP Deflator (% annual)	A healthy level of inflation stirs economic development and expands foreign capital inflows in an economy (Dollar & Kraay, 2001).	WDI
IQ	Quality of institutions	Quality institutions attract FDI inflows, while bad institutional quality impedes FDI inflows. (Ali et al., 2010; Buchanan et al., 2012).	Calculated from ICRG data using the methodology (2018)

Source: Author's Calculations/Estimations.

Table 2. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
IFDI	1,606	3.53	4.82	−37.15	50.01
IQ	1,606	0.00	1.57	−3.95	5.03
DCF	1,606	23.69	8.09	−2.42	73.77
DCF*IQ	1,606	1.99	38.69	−123.15	174.90
PRI	1,606	26.07	15.33	0	96.31
PUBI	1,606	10.24	8.95	0	67.11
INFLATION	1,606	14.41	139.28	−29.69	4800.53

Source: Author's Calculations/Estimations.

of PRI (%GDP) is 26.07. Additionally, the mean value of FDI (%GDP) is 3.53, while an average range of the institutional quality index assumes values within −3.62 to 4.90. The mean value of inflation (% annual) is 14.41. Additionally, the mean value of a variable of interaction effects (DCF^{x}IQ) is 1.99.

4.2. Cross-Sectional dependency order of integration and slope homogeneity tests

The first-generation panel unit root tests assume cross-sectional independence across the units. They might lose a degree of freedom if these unit root methods are applied for the dataset that suffers from cross-sectional dependence (Sadorsky, 2013). Henceforth, we apply the CD test to check for common correlation bias in the dataset. Accordingly, we will apply Pesaran (2004) CD test to check for cross-sectional dependency across the units in our panel dataset. CD test produces unbiased results as the cross-country units increase and reach infinity (Pesaran, 2004). We have reported our CD test results in Table 3, which exhibits the presence of cross-dependency in the variables of our study. Henceforth, we reject our null hypothesis of cross-sectional independence among the study variables and accept the alternative hypothesis of cross-sectional dependence among the variables of our study. Due

Table 3. Panel unit-rooting (CIPS) and CD test.

Variable	ρ̂	CD	CIPS Test Level	CIPS Test First Difference
FDI	0.258	24.50***	−4.477***	−16.856***
IQ	0.420	40.04***	−0.127	−13.054***
DCF	0.343	32.16***	−2.539***	−15.592***
DCF*IQ	0.400	41.06***	−1.489	−15.160***
PRI	0.482	69.45***	−2.219***	−12.607***
PUBI	0.490	63.87***	−0.066	−14.218
INFLATION	0.236	30.67***	−3.459***	−22.592***
Testing for slope heterogeneity:				
H0: slope coefficients are homogenous		Delta	3.865***	
		adj. Delta	4.514***	

Note: *, **, and *** represent significance at 1%, 5% and 10% respectively.
Source: Author's Calculations/Estimations.

to the presence of cross-sectional dependency, we have applied used Pesaran's (2007) cross-sectionally augmented panel unit root test (CIPS) and $Z(t\text{-bar})$). We have estimated unit root tests with a constant term. Panel unit root test results show that the variables are stationary at first difference. Correlation ($\hat{\rho}$) across the variables and result estimations for testing of slope heterogeneity are reported in Table 3. As per value of Delta, we reject the null hypothesis that slope coefficients are homogenous and accept the alternative hypothesis that slope coefficients are heterogenous.

In this study, we have applied CS-ARDL approach to address the issue of endogeneity and common correlation bias in our empirical study for developing economies. CS-ARDL imposes short-term heterogeneity and long-term homogeneity on estimated parameters and it is executed under the error correction mechanism.

4.3. The impact of private Capital formation and institutional quality on FDI inflows for developing countries

The empirical estimations of our baseline model (M1.1) and extended models (M1.2 & M1.3) show that aggregate domestic capital formation (DCF) crowds in foreign capital inflows in the long run for developing countries. The result estimations are displayed in Table 4. Among the other variables, institutional quality (IQ) attracts FDI inflows for developing countries. Quality institutions decrease the cost of production and running cost of business, thus giving rise to profitability and upsurge economic activities. Conversely, bad institutional quality increases uncertainty in addition to running cost of the business and thus, in turn, impedes economic activities. Our results estimation is consistent with those of Ali et al. (2010), North (1990), Buchanan et al. (2012) and Huynh et al. (2020) which argue that strong institutions promote FDI inflows while poor institutional quality crowds out FDI inflows. The sign of interaction term (DCF*IQ) of domestic capital formation and institutional quality show that institutional quality and domestic capital formation are adversely interconnected and as a result, obstruct FDI inflows in our extended model (M1.2), or it does not contribute to FDI inflows for our extended model (M1.3) in the long run. The coefficient of error correction term (EC) in the M1.1, M1.2 and M1.3 show a long-run relationship between foreign capital inflows and other variables of interest

Table 4. The impact of DCF and IQ on FDI inflows.

DV: FDI	M1.1	M1.2	M1.3
Error Correction (EC)	−0.6122***	−0.6062***	−0.5864***
	(−14.82)	(−12.85)	(−12.16)
Long run Estimates			
DCF	0.0666***	0.0972***	0.0465***
	(5.07)	(6.62)	(5.84)
IQ	0.5107***	0.8508***	0.7746***
	(6.83)	(5.01)	(6.01)
DCF *IQ		−0.0137**	−0.0025
		(−2.06)	(−0.53)
INFLATION			−0.0018
			(−1.60)
Short run Estimates			
Δ DCF	0.0960***	0.0306	0.0465***
	(4.11)	(0.38)	(5.84)
Δ IQ	0.5705*	0.5636	0.7746***
	(1.89)	(0.33)	(6.01)
Δ DI *IQ		0.0333	−0.0025
		(0.46)	(−0.53)
Δ. INFLATION			−0.0018
			(−1.60)
Constant	0.4727	−0.1466	0.9380***
	(1.62)	(−0.48)	(2.95)
Observations	1533	1533	1533
Country	73	73	73

DV: DV denotes dependent variable in our model; () denote *t*-values in the parenthesis.
Note: '***', '**' and '*' denote level of significance at 1%, 5% and 10% respectively.
Source: Author's Calculations/Estimations.

of our study. Our short-run rate of adjustment towards long-run equilibrium is 61.22%, 60.62% and 58.64% in the M1.1, M1.2 and M1.3, respectively.

Variable of interaction effects (DCF*IQ) and inflation rate assert insignificant impact on FDI inflows in the short and long run for developing countries. We will explain the short-run results of our model, and we found that DCF and IQ augment FDI inflows in the short run. However, the signs of coefficients of the variable of interaction effects (DCF×IQ) and the inflation rate are insignificant. They do not contribute to FDI inflows in the short run and long run. The signs of coefficients of the variable of interaction effects (DCF×IQ) and inflation rate are contrary to expectations in the short run and long run. The insignificant and unexpected result in Table 4 indicates aggregation bias and demand deep down sectoral by decomposing the aggregate domestic capital formation (Private and Public Capital).

4.4. The impact of private Capital formation and institutional quality on FDI inflows for developing countries

In Table 5, we investigate the influence of PRI, IQ, and other variables of interest on FDI inflows in the long and short run. Our result estimations show that private capital formation (PRI) crowds out foreign capital inflows in the long run for developing countries in our extended models (M1.2 & M1.3). One unit increase in PRI decreases significantly FDI inflows in the developing countries; this negative linkage between PRI and foreign capital inflows might be attributable to the fact that FDI inflows are significantly utilized for public sector development with less focused on the development of private sector in the developing countries.

Table 5. The impact of PRI and IQ on FDI inflows.

DV: FDI	M1.1	M1.2	M1.3
Error Correction (EC)	−0.6069***	−0.6241***	−0.5891***
	(−14.66)	(−13.86)	(−12.27)
Long run Estimates			
PRI	−0.0102	−0.0230***	−0.0216***
	(−1.64)	(−4.67)	(−4.70)
IQ	0.4047***	0.3767***	0.5222***
	(5.79)	(3.75)	(5.70)
PRI *IQ		0.0008	−0.0068**
		(0.24)	(−2.03)
INFLATION			−0.0012
			(−0.59)
Short run Estimates			
Δ PRI	0.0378	0.1397	0.0973
	(1.14)	(1.53)	(0.80)
Δ IQ	0.4047***	0.3767***	0.5222***
	(5.79)	(3.75)	(5.70)
Δ PRI *IQ		0.0008	−0.0068**
		(0.24)	(−2.03)
Δ. INFLATION			−0.0012
			(−0.59)
Constant	0.8058***	0.3578	0.1993
	(2.74)	(1.21)	(0.67)
Observations	1533	1533	1533
Country	73	73	73

DV: DV denotes dependent variable in our model; () denote *t*-values in the parenthesis.
Note: '***', '**' and '*' denote level of significance at 1%, 5% and 10% respectively.
Source: Author's Calculations/Estimations.

Our empirical results show that institutional quality (IQ) give rise to FDI inflows in our baseline (M1.1) and extended models (M1.2 & M1.3). Thus, quality institutions decrease the business's running and operating costs and augment FD inflows. Quality institutions also protect a firm's intellectual property rights, which ultimately boosts investor confidence in the commercial setup. The sign of interaction term (PRI*IQ) of private capital and institutional quality show that IQ and PRI are unfavourably interconnected and thus, hinder FDI inflows in our extended model (M1.3), or it does not contribute to FDI inflows for our extended model (M1.2) in the long run. Conversely, in our extended model (M1.3), other variables such as the inflation rate do not stimulate foreign capital inflows in the long run.

The coefficient of error correction term (EC) in the M1.1, M1.2 and M1.3 shows a long-run relationship between foreign capital inflows and other variables of interest of our study. Our short-run rate of adjustment towards long-run equilibrium is 60.69%, 62.41% and 58.91%, respectively in the M1.1, M1.2 and M1.3. Looking into the short-run results in Table 5, we analyse the influence of PRI and IQ and other variables of interest on FDI inflows in the short run, and we found that PRI, IQ and other variables of interest have an insignificant effect on FDI inflows except for inflation rate because variables can behave differently in the short run due to difference of period if we compare with the long run.

4.5. The impact of public Capital formation and institutional quality on FDI inflows for developing countries

In Table 6, we investigate the influence of PUBI, IQ and other variables of interest on FDI inflows for developing countries in the long and short-run. As a result,

Table 6. The impact of PUBI and IQ on FDI inflows.

DV: FDI	M1.1	M1.2	M1.3
Error Correction (EC)	−0.6126***	−0.6473***	−0.6465***
	(−14.34)	(−13.75)	(−13.34)
Long run Estimates			
PUBI	0.0630***	−0.0236	0.0615***
	(10.93)	(−1.63)	(11.41)
IQ	0.6102***	0.6336***	0.6005***
	(9.12)	(8.11)	(7.50)
PUBI *IQ		−0.0162***	0.0027
		(−3.18)	(0.90)
INFLATION			−0.0027**
			(−2.06)
Short run Estimates			
Δ PUBI	0.0225	−0.2791	−0.1738
	(0.44)	(−0.60)	(−0.35)
Δ IQ	0.8147***	0.5552	0.0829
	(3.06)	(0.59)	(0.08)
Δ PUBI *IQ		0.2502	0.2858
		(1.43)	(1.50)
Δ. INFLATION			0.0288*
			(1.79)
Constant	0.8335***	1.1441***	0.7676***
	(2.74)	(3.66)	(2.78)
Observations	1533	1533	1533
Country	73	73	73

DV: DV denotes dependent variable in our model; () denote *t*-values in the parenthesis.
Note: '****', '**' and '*' denote level of significance at 1%, 5% and 10% respectively.
Source: Author's Calculations/Estimations.

estimations show that PUBI crowds in FDI inflows in the long run for developing countries in our models (M1.11 & M1.3) except M1.2. Our empirical findings show that 1 US dollar increase in PUBI increase FDI inflows by 0.0630 and 0.0615 in our baseline (M1.1) and extended model (M1.3) respectively. Thus, private capital crowds in FDI inflows in developing countries. This positive relationship between public capital and FDI inflows might exist because the increase in FDI inflows in the developing economy is keenly focused on the development of the public sector. Alike, our results show that institutional quality (IQ) give rise to FDI inflows in our baseline (M1.1) and extended models (M1.2 & M1.3). The sign of interaction term (PUBI*IQ) show that IQ and PUBI are badly interconnected to decrease FDI inflows in our extended model (M1.2) or it does not contribute to FDI inflows for our extended model (M1.3) in the long run. Conversely, other variables of interest, such as the inflation rate, hamper foreign capital inflows in the long run in our extended model (M1.3).

The coefficient of error correction term (ECT) in the M1.1, M1.2 and M1.3 show a long-run relationship between foreign capital inflows and other variables of interest of our study. Our short-run rate of adjustment towards long-run equilibrium is 61.26%, 64.73% and 64.65%, respectively, in the M1.1, M1.2 and M1.3. Looking into the short-run results reported in Table 6, we analyse the effects of PRI, IQ and other variables of interest on FDI inflows. In short, we found that PRI, IQ and other variables of interest have an insignificant impact on foreign capital inflows except for the inflation rate.

Table 7. The simultaneous impact of PRI, PUBI and IQ on FDI inflows.

DV: FDI	M1.1	M1.2	M1.3
Error Correction (EC)	−0.6217***	−0.6748***	−0.6426***
	(−14.55)	(−14.23)	(−13.88)
Long run Estimates			
PRI	−0.0133**	−0.0168***	−0.0212***
	(−2.47)	(−3.01)	(−3.79)
PUBI	0.0491***	0.0628***	0.0562***
	(6.45)	(7.25)	(6.19)
IQ	0.4705***	0.5305***	0.5235***
	(7.42)	(8.71)	(8.99)
PRI* PUBI *IQ		0.0002**	0.0003**
		(2.00)	(2.36)
INFLATION			0.0007
			(0.46)
Short run Estimates			
Δ PRI	0.0364	0.0134	0.1064*
	(0.74)	(0.29)	(1.68)
Δ PUBI	0.0439	−0.3424	−0.0363
	(0.80)	(−1.46)	(−0.15)
Δ IQ	0.2664	0.1821	−0.0813
	(0.94)	(0.31)	(−0.12)
Δ PRI* PUBI *IQ		0.0071	0.0092*
		(1.61)	(1.94)
Δ. INFLATION			0.0217
			(1.28)
Constant	−1.1379***	−0.7667**	−1.3415***
	(−3.91)	(−2.46)	(−4.24)
Observations	1533	1533	1533
Country	73	73	73

DV: DV denotes dependent variable in our model; () denote *t*-values in the parenthesis.
Note: '****', '**' and '*' denote level of significance at 1%, 5% and 10% respectively.
Source: Author's Calculations/Estimations.

4.6. The impact of private Capital formation, public Capital formation and institutional quality on FDI inflows for developing countries

In Table 7, we investigate the simultaneous impact of PRI, PUBI, IQ and other variables of interest on FDI inflows in the long and short run. Our result estimations show that private capital formation (PRI) crowds out foreign capital inflows in the long run. The negative impact of private capital formation on foreign capital inflows (Tables 5 and 7) and the positive influence of public capital formation on FDI inflows (Tables 6 and 7) show that capital markets are weaker in the developing countries, and significant sectors of the economy are strongly controlled by government by the larger extent. In our baseline and extended models, public capital formation crowds in FDI inflows in the long run. Institutional Quality (IQ) attract foreign capital inflows in the long run in our models. In our extended models, the interaction term (PRI*PUBI*IQ) of private capital, public capital and institutional quality are favourably interconnected attract to FDI inflows (IFDI) in the long run. Our finding is exciting that there is a strong positive link between private capital formation, public capital formation and institutional quality to promote FDI inflows in the long run. Quality institutions are strongly linked with private capital and public capital formation to crowd FDI inflows in developing countries. Empirical estimations suggest that higher level of institutional quality is strongly interrelated with private and public capital to promote FDI inflows. Conversely, in case of weak institutional quality,

Table 8. Short run casual relations.

Granger Causes	Z-bar	Z-bar	Outcome
Inflation ⇄ IFDI	1.8022*	4.0115***	Bidirectional Causal Relations
DCF ⇄ IFDI	5.3426***	4.3751***	Bidirectional Causal Relations
IQ⇄ IFDI	4.4269***	2.9618***	Bidirectional Causal Relations
PRI⇄ IFDI	5.9362***	4.1793***	Bidirectional Causal Relations
PUB⇄ IFDI	3.0202***	1.8271***	Bidirectional Causal Relations

Source: Author's Calculations/Estimations.

MNCs would be reluctant to invest across the borders due to expropriation risk from the government or disadvantageous rules changes after investment. Empirical results suggest that MNCs will be reluctant to invest in these countries with corrupt institutional quality even though developing countries are financially open for foreign capital inflows or freely liberalise their borders for international capital inflows.

The coefficient of error correction term (ECT) in the M1.1, M1.2 and M1.3 show a long-run relationship between foreign capital inflows and other variables of interest of our study. Our short-run rate of adjustment towards long-run equilibrium is 62.17%, 67.48% and 64.26%, respectively, in the M1.1, M1.2 and M1.3. Looking into the short-run results in Table 7, we investigate the short-run impact of PRI, PUBI, IQ and other variables of interest on FDI inflows in the case of developing economies, we found that PRI, PUBI, IQ and other variables of interest have an insignificant effect on FDI inflows because variables can behave differently in the short run if we compare with the long run due to short span in the short run. However, the signs of coefficients of the variable of interaction effects (PRI^x PUBI^x IQ) significant and positively contribute to foreign capital inflows in the short run in our extended models. Other variables such as INFLATION have an insignificant influence on foreign capital inflows in the long and short run.

We have applied Dumitrescu and Hurlin (2012) Granger non-causality test as a robustness check. Table 8 reports that there is bidirectional causality exist between DCF and IFDI (DCF↔IFDI). Additionally, we notice that there is also bidirectional causality exist between private capital formation and IFDI (PRI↔IFDI). Furthermore, there also bidirectional relationship exist between IFDI and public capital formation (PUBI↔IFDI). In sum, our granger causality result estimations strongly support the long run impact of aggregate domestic capital formation of FDI inflows and validate our result estimations of CS-ARDL methods by providing the robust checks.

5. Conclusion and recommendations

Our empirical study investigates the short-run and long-run impact of DCF and IQ on FDI inflows in developing countries. Given the common correlation of our variables across the sampled developing economies, we applied CS-ARDL methods to control endogeneity and remove cross-sectional dependency issues in the variables of our empirical study. Our results show that public capital crowds in while private capital crowds out FDI inflows. Our empirical findings infer that the nature of private and public capital functions differently to macro-economic variables; thus, aggregating them together might incur bias. Furthermore, our result estimations show that institutional quality spurs FDI inflows in the long-run economies of developing countries.

The interaction of Domestic capital formation and institutional quality (DCF*IQ) insignificantly affect FDI inflows. However, the sign of the coefficient of the interaction term (PRI*PUBI*IQ) of PRI, PUBI and IQ turned to be significant and positive when we split DCF into public and private capital in our extended models. Public capital formation attracts FDI inflows in developing countries, and private capital formation obstructs FDI inflows. The positive linkage between public investment and FDI inflows implies that PUBI might complement attracting FDI inflows.

Our empirical investigation also manifests that institutional quality plays a crucial role in elevating FDI inflows in the long run. Quality institutions promote private and public capital, and consequently, thus; an increase of private and public capital formation stimulate FDI inflows in the long run for developing countries. Out of many components of institutional quality, existing empirical literature suggest that rule of law and control of corruption are prime factors in promoting FDI inflows. As per empirical results, we notice that institutional quality significantly contribute to attract FDI inflows in all models of our study and we infer from empirical findings that a high level of corrupt business practices and the fragile rule of law are counterproductive with MNCs investment decisions. Positive parameters of public investment and institutional quality reinforce their importance in fostering FDI inflows.

Our findings may not be generalized in the context of developed and emerging countries. Therefore, our study creates a new avenue to conduct a comprehensive study considering different income stratifications.

Notes

1. Financial Express: FDI Flows in the Emerging Markets. Financial Times. 22 May 2007.
2. Russia: Reduced Expectations, The Economist, EIU No. 24. April 16, 2003.
3. Government Stability; Democratic Accountability; Law and Order; Bureaucracy Quality; Socio-Economic Conditions and Corruption Index.

Acknowledgments

Author contributions

All authors equally involved in the contribution of the paper.

Data availability on request

There are some restrictions apply to dataset due to institutional privacy issues but dataset of this empirical study might be available from corresponding author on the suitable request.

Declaration of interests

There is no conflict of interest for authorship issues in this empirical study.

Ethics statement

N/A

References

Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *American Economic Review*, *113*(5), 949–995.

Addison, T., & Heshmati, A. (2003). The new global determinants of FDI flows to developing countries: The importance of ICT and democratization. World Institute for Development Economics, Discussion Paper, United Nation University.

Ali, F. A., Fiess, N., & MacDonald, R. (2010). Do institutions matter for foreign direct investment? *Open Economies Review*, *21*(2), 201–219. https://doi.org/10.1007/s11079-010-9170-4

Ameer, W., Sohag, K., Xu, H., & Halwan, M. M. (2020). The impact of OFDI and institutional quality on domestic capital formation at the disaggregated level: Evidence for developed and emerging countries. *Sustainability*, *12*(9), 3661. https://doi.org/10.3390/su12093661

Ameer, W., Xu, H., Sohag, K., & Shah, S. H. (2021). Outflow FDI and domestic investment: Aggregated and disaggregated analysis. *Sustainability*, *13*(13), 7240. https://doi.org/10.3390/su13137240

Amighini, A. A., McMillan, M. S., & Sanfilippo, M. (2017). *FDI and capital formation in developing economies: New evidence from industry-level data (No. w23049)*. National Bureau of Economic Research.

Andrade, J. S., & Duarte, A. P. (2016). Crowding-in and crowding-out effects of public investments in the Portuguese economy. *International Review of Applied Economics*, *30*(4), 488–506. https://doi.org/10.1080/02692171.2015.1122746

Ang, J. B. (2009). Do public investment and FDI crowd-in or crowd-out private domestic investment in Malaysia. *Applied Economics*, *41*(7), 913–919. https://doi.org/10.1080/00036840701721448

Argimon, I., Gonzalez-Paramo, J. M., & Roldan, J. M. (1997). Evidence of public spending crowding-out from a panel of OECD countries. *Applied Economics*, *29*(8), 1001–1010.

Asiedu, E., & Villamil, A. P. (2000). Discount factors and thresholds: Foreign investment when enforcement is imperfect. *Macroeconomic Dynamics*, *4*(01), 1–21. https://doi.org/10.1017/S1365100500014012

Atabaev, N., Ganiev, J., & Alymkulova, N. (2018). Crowding-out (or-in) effect in transition economies: Kyrgyzstan case. *International Journal of Development Issues*, *17*(1), 102–113. https://doi.org/10.1108/IJDI-09-2017-0144

Bai, J., & Ng, S. (2004). A panic attack on unit roots and cointegration. *Econometrica*, *72*(4), 1127–1177. https://doi.org/10.1111/j.1468-0262.2004.00528.x

Becchetti, L., & Hasan, I. (2004). The effects of (within and with EU) regional integration: Impact on real effective exchange rate volatility, institutional quality and growth for MENA countries. World Institute for Development Economics Research, Discussion Paper No. 2005/73, United Nations University.

Bernheim, B. (1989). A neoclassical perspective on budget deficits. *Journal of Economic Perspectives*, *3*(2), 55–72. https://doi.org/10.1257/jep.3.2.55

Bevan, A., Estrin, S., & Meyer, K. (2004). Foreign investment location and institutional development in transition economies. *International Business Review*, *13*(1), 43–64. https://doi.org/10.1016/j.ibusrev.2003.05.005

Buchanan, B., Le, Q. V., & Rishi, M. (2012). Foreign direct investment and institutional qual-
ity: Some empirical evidence. *International Review of Financial Analysis*, *21*, 81–89. https://
doi.org/10.1016/j.irfa.2011.10.001

Choi, I. (2006). Combination unit root tests for cross-sectionally correlated panels (chapter
12). In: Corbae, D., Durlauf, S. N., & Hansen, B. E. (Eds.). *Econometrics theory and practice.
Frontiers of analysis and applied research* (pp. 311–333). Cambridge University Press.

Cuervo-Cazurra, A. (2006). Who cares about corruption? *Journal of International Business
Studies*, *37*(6), 807–822. https://doi.org/10.2307/4540385

Cuervo-Cazurra, A. (2008). The effectiveness of laws against bribery abroad. *Journal of
International Business Studies*, *39*(4), 634–651. https://doi.org/10.1057/palgrave.jibs.8400372

Daude, C., & Stein, E. (2007). The quality of institutions and foreign direct investment.
Economics & Politics, *19*(3), 317–344. https://doi.org/10.1111/j.1468-0343.2007.00318.x

Dollar, D., & Kraay, A. (2001). Growth is good for the poor. *World Bank Policy, Research
Department Working Paper No. 2587*, Washington, DC.

Drabek, Z., & Payne, W. (2002). The impact of transparency on foreign direct investment.
Journal of Economic Integration, *17*(4), 777–810. https://doi.org/10.11130/jei.2002.17.4.777

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous
panels. *Economic Modelling*, *29*(4), 1450–1460. https://doi.org/10.1016/j.econmod.2012.02.014

Dunning, J. H. (2002). *Determinants of foreign direct investment: Globalization-induced changes
and the role of policies [Paper presentation].* Paper Presented at the Annual World Bank
Conference on Development Economics, Toward Pro-Poor Policies-Aid: Europe (2002–2003),.

Gani, A. (2007). Governance and foreign direct investment links: Evidence from panel data estima-
tions. *Applied Economics Letters*, *14*(10), 753–756. https://doi.org/10.1080/13504850600592598

Gastanaga, V. M., Nugent, J. B., & Pashamova, B. (1998). Host country reforms and FDI
inflows: How much difference do they make? *World Development*, *26*(7), 1299–1314. https://
doi.org/10.1016/S0305-750X(98)00049-7

Globerman, S., & Shapiro, D. (2002). Global foreign direct investment flows: The role of gov-
ernance infrastructure. *World Development*, *30* (11), 1899–1919. https://doi.org/10.1016/
S0305-750X(02)00110-9

Globerman, S., & Shapiro, D. (2003). Governance infrastructure and US foreign direct invest-
ment. *Journal of International Business Studies*, *34*(1), 19–39. https://doi.org/10.1057/pal-
grave.jibs.8400001

Henisz, W. (2000). The institutional environment for multinational investment. *Journal of
Law, Economics, and Organization*, *16*(2), 334–364. https://doi.org/10.1093/jleo/16.2.334

Henisz, W., & Williamson, O. (1999). Comparative economic organization – within and between
countries. *Business and Politics*, *1*(3), 261–276. https://doi.org/10.1515/bap.1999.1.3.261

Huynh, C. M., Nguyen, V. H. T., Nguyen, H. B., & Nguyen, P. C. (2020). One-way effect or
multiple-way causality: Foreign direct investment, institutional quality and shadow econ-
omy? *International Economics and Economic Policy*, *17*(1), 219–239. https://doi.org/10.1007/
s10368-019-00454-1

Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels.
Journal of Econometrics, *115*(1), 53–74. https://doi.org/10.1016/S0304-4076(03)00092-7

IMF. (2003). World Economic Outlook: Growth and Institutions. http://www.imf.org/external/
pubs/ft/weo/2003/01/

Jensen, N. M. (2003). Democratic governance and multinational corporations: Political regimes
and inflows of foreign direct investment. *International Organization*, *57*(3), 587–616. https://
doi.org/10.1017/S0020818303573040

Ju, J., & Wei, S.-J. (2007). *Domestic institutions and the bypass effect of financial globalization*.
NBER, Working Paper No. 13148.

Jude, C., & Levieuge, G. (2013). *Growth effect of FDI in developing economies: The role of insti-
tutional quality*. MPRA, Working Paper. No. 49321., Germany.

Kollamparambil, U., & Nicolaou, M. (2011). Nature and association of public and private
investment: Public policy implications for South Africa. *Journal of Economics and
International Finance*, *3*(2), 98–108.

Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of Econometrics*, *108*(1), 1–24. https://doi.org/10.1016/S0304-4076(01)00098-7

Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, *61*(S1), 631–652. no https://doi.org/10.1111/1468-0084.0610s1631

Mahmoudzadeh, M., Sadeghi, S., & Sadeghi, S. (2013). Fiscal spending and crowding-out effect: A comparison between developed and developing countries. *Institutions and Economies*, *5*(1), 31–40.

Mauro, P. (1995). Corruption and growth. *The Quarterly Journal of Economics*, *110*(3), 681–712. https://doi.org/10.2307/2946696

Mohanty, R. (2018). Does fiscal deficit crowd out private corporate sector investment in India? *Singapore Economic Review*, *63*(1), 1–24.

Moon, H., & Perron, B. (2004). Testing for unit root in panels with dynamic factors. *Journal of Econometrics*, *122* (1), 81–126. https://doi.org/10.1016/j.jeconom.2003.10.020

Mountford, A., & Uhlig, H. (2005). *What are the effects of fiscal policy shocks?* National Bureau of Economic Research, Working Paper No. 14551.

Narayan, P. K. (2004). Do public investments crowd-out private investments? Fresh evidence from Fiji. *Journal of Policy Modeling*, *26*(6), 747–753. https://doi.org/10.1016/j.jpolmod.2004.06.002

Ndikumana, L., & Verick, S. (2008). The linkages between FDI and domestic investment: Unravelling the developmental impact of foreign direct investment in Sub-Saharan Africa. *IZA*, Working Paper No. 3296.

Nguyen, C. T., & Trinh, L. T. (2018). The impacts of public investment on private investment and economic growth: Evidence from Vietnam. *Journal of Asian Business and Economic Studies*, *25*(1), 15–32. https://doi.org/10.1108/JABES-04-2018-0003

Noorbakhsh, F., Paloni, A., & Youssef, A. (2001). Human capital and FDI inflows to developing countries: New empirical evidence. *World Development*, *29*(9), 1593–1610. https://doi.org/10.1016/S0305-750X(01)00054-7

North, D. C. (1981). *Structure and change in economic history*. Norton.

North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

OECD. (2002). Foreign direct investment for development: maximizing benefits, minimizing costs. Retreived April 14, 2010 from http://www.oecd.org/dataoecd/47/51/1959815.pdf

Peres, M., Ameer, W., & Xu, H. (2018). The impact of institutional quality on foreign direct investment inflows: Evidence for developed and developing countries. *Economic Research-Ekonomska Istraživanja*, *31*(1), 626–644. https://doi.org/10.1080/1331677X.2018.1438906

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, *22* (2), 265–312. https://doi.org/10.1002/jae.951

Pesaran, M. H., & Tosetti, E. (2011). Large panels with common factors and spatial correlation. *Journal of Econometrics*, *161*(2), 182–202. https://doi.org/10.1016/j.jeconom.2010.12.003

Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. University of Cambridge, *Cambridge Working Papers in Economics No. 435. CESifo Working Paper Series No. 1229.*

Quazi, R. M. (2007). Investment climate and foreign direct investment: A study of selected countries in Latin America. *Global Journal of Business Research*, *1*(1), 1–13.

Richards, D. C., & Nwankwo, S. (2005). Reforming the legal environment of business in Sub-Saharan Africa: Moderating effects on foreign direct investment. *Managerial Law*, *47*(5), 154–163. https://doi.org/10.1108/03090550510771179

Sadorsky, P. (2013). Do Urbanization and industrialization affect energy intensity in developing countries? *Energy Economics*, *37*(3), 52–59. https://doi.org/10.1016/j.eneco.2013.01.009

Şen, H., & Kaya, A. (2014). Crowding-out or crowding-in? Analyzing the effects of government spending on private investment in Turkey. *Panoeconomicus*, *6*, 631–651.

Shah, H. S., Hafsa, H., Simon, C., & Mohsin, H. A. (2020). Sectoral FDI inflows and domestic investment in Pakistan. *Journal of Policy Modeling*, *42*(1), 96–111. https://doi.org/10.1016/j.jpolmod.2019.05.007

Smith, S. (1997). Restrictive policy toward multinationals: Argentina and Korea. *Case Studies in Economic Development.*, (2nd ed.), 178–189.

Smith, L. V., Leybourne, S., Kim, T. H., & Newbold, P. (2004). More powerful panel data unit root tests with an application to mean reversion in real exchange rates. *Journal of Applied Econometrics*, *19*(2), 147–170. https://doi.org/10.1002/jae.723

Staats, J. L., & Biglaiser, G. (2012). Foreign direct investment in Latin America: The importance of judicial strength and rule of law. *International Studies Quarterly*, *56*(1), 193–202. 00690.x https://doi.org/10.1111/J.1468-2478.2011

The Economist. (2003)., Russia: Reduced Expectations. EIU No. 24. April 16,

Xu, X., & Yan, Y. (2014). Does public investment crowd-out private investment in China. *Journal of Economic Policy Reform*, *17*(1), 1–12. https://doi.org/10.1080/17487870.2013.866897