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RESEARCH PAPER

Foreign Direct Investment and Private Domestic Investment: Does Institutional Quality Matter?

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Abstract

Using a two-step system generalized method of moment (SGMM) this study explored the role of institutional quality while analyzing the links between foreign direct investment (FDI) and domestic investment (DI) in 21 Asian developing and emerging countries from 2011 to 2016. Our empirical strategy indicates that the crowds-out and crowds-in effect of FDI on domestic investment depends on the chosen dependent variable. Using domestic private investment (DPI) as the dependent variable, the study confirms the crowding-out effects of FDI on domestic investment. Conversely, utilizing the gross fixed capital formation (GFCF) findings show that the FDI crowds in the domestic investment. It is also revealed that institutional quality matters in determining such nexus. The study further recommends the need to augment the positive role of institutional quality in such a way that the crowding-out effect of the concurrent increase in FDI and institutional quality will augur well for domestic investment.

Keywords: Domestic Private Investment, Foreign Direct Investment, Institutional Quality, Two-step System Generalized Method of Moment (SGMM).
JEL Classification: E22, F21, F23, O53.

1. Introduction

Foreign direct investment (FDI) is one of the essential drivers of economic development. This investment often becomes the major external source of financing to increase productivity and reduce the poverty rate in developing countries (Do et al., 2021; Kosová and Ayyagari, 2011). This works through potential FDI spillover effects which include; the transfer of knowledge and technology, increased competition and employment, as well as improvement in labor standards for the host economies (OECD, 2002; Todaro and Smith, 2006).

Moreover, FDI is considered more resilient to economic crises relative to other capital flows (Loungani and Razin, 2001). Therefore, foreign investment is projected to boost the economic transformation of host economies.

Despite these benefits, FDI also has various effects on other macroeconomic variables such as investment structure itself. First, the existence of FDI could complement the domestic private investment (DPI) i.e. crowding-in effect. This means that FDI might stimulate domestic private investment by raising the demand for both the goods and services manufactured by local firms (Cardoso and Dornbusch, 1989; Markusen and Venables, 1999). In addition, Sohinger and Harrison (2004) believed that FDI lowers financial constraints and therefore increases funds for domestic firms. Second, FDI also might substitute the role of domestic private investment (crowding-out effect) due to the gaps in knowledge, experience, and technological advancement between local and foreign firms (Szkorupová, 2015). The gaps lead to the failure of local firms to support the backward and forward linkages of foreign investment in host economies.

Empirical studies which explore the relationship between the two forms of investment indicate inconclusive findings. According to Morrissey and Udomkerdmongkol (2012), FDI displaced the domestic private investment in selected 46 developing countries from 1996 to 2009. Along with this study, Mutenyo et al. (2010) also concluded that FDI crowds out the role of DPI in 34 selected Sub-Saharan countries between 1990 to 2003. On the other hand, Agosin and Machado (2007) claimed that FDI boosts DPI in Asian countries. Similarly, Mišun and Tomšík (2002), have found the same findings in Poland respectively. Moreover, Yao and Salim (2020) found a neutral association between DPI and FDI in China at the national level. However, their empirical analysis at the provincial level revealed that while FDI crowded in the DPI in the eastern part of the region, it turns out that more FDI leads to low DPI in the western part of the region.

Even though the empirical results were mixed, less attention was paid to whether institutional quality matters in determining such a relationship (Morrissey and Udomkerdmongkol, 2012). While it is true that high institutional quality is associated with better overall investment performance, it is less convincing of how the specific quality of an institution affects a specific type of investment. According to Blonigen and Piger (2014), some institutional quality indicators matter in certain countries and not in other countries. For instance, the manufacturing industry is more prone to be localized in South African countries with high institutional quality (Lederman et al., 2010). While political stability attracts FDI in certain regions, stable government policy also could reduce FDI in other regions (Morrissey and Udomkerdmongkol, 2012).

A significant contribution has been made by (Morrissey and Udomkerdmongkol, 2012) in understanding the inter-relationship between

investment and institutional quality for 46 selected countries from 1996 to 2009. They claimed that there was a negative link between FDI and DPI (crowding-out) with a strong association with high institutional quality. A study by Farla et al. (2014), however, criticized the aforementioned study. They stated that the poor proxy for domestic private investment and the flawed methodology utilized might lead to a misleading conclusion. By reconstructing the proxy of private investment and choosing a different methodology, they found adverse findings. They revealed that there was no crowding-out effect and strong evidence of the effect of institutional quality on the relationship between the two types of investment. Therefore, this paper attempts to extend the discussion of how the relationship between DPI and FDI is influenced by several types of institutional quality in the context of 21 emerging and developing countries in Asia from 2011 to 2016.

The remaining sections of the study are structured as follows. Section two reviews the relevant literature on investment and institutional quality. Section three presents the methodology of the study. Section four discusses the result of the study while section five presents the main conclusion.

2. Literature Review

According to Mankiw (2012), in contrast to consumption expenditures for goods that produce direct utilities, investments are aimed at providing a higher standard of living in the future. In other words, investment can be interpreted as a sacrifice of current consumption over expectations of future profits. Investment has an important role in boosting economic growth (OECD, 2002; Todaro and Smith, 2006). A sustainable investment might contribute to increasing economic activity and employment opportunities which lead to a higher standard of living (Sukirno, 2010). This could arise from three important functions of investment, namely; a rising aggregate demand, increasing production capacity, as well as technological development.

There are some essential determinants of investment activities. According to Samuelson (2004), there are three factors in determining investment activities: income or revenue, cost of investment, and expectations. Furthermore, Blanchard and Johnson (2013) stated that investment decisions depend upon the present value of the expected profit, as well as the price of the capital. This implies that investment is a future-oriented activity that depends mainly on the expected future profits. This means that investment has a positive relationship with expectations of future profits. A surge in an investment indicates a greater expected return on investment. Conversely, a decline in investment levels reflects a decline in expectations of future profits. Meanwhile, according to Mankiw (2012), investment is influenced by interest rates, where all types of investments have a

negative relationship with interest rates. An excessive rate of interest will increase the cost of capital for the company and reduce the future profits of investments.

The investment itself comprises two significant components i.e. domestic private investment (DPI) and foreign direct investment (FDI). There are three possible predictions on how these two types of investment influence each other. First, there is a crowding-in effect where a higher flow of FDI leads to higher DPI. Second, there is a crowding-out effect when rising FDI reduces the role of domestic private investment. Lastly, there is a neutral relationship where the presence of FDI does not affect the DPI (Yao and Salim, 2020).

According to Krugman and Obstfeld (2013), FDI is defined as an international capital flow where foreign companies establish or expand their business activities in other countries. In this regard, FDI allows foreign investors to manage and control domestic companies or resources. Based on this definition, FDI can be classified into two categories: (i) Greenfield FDI, which is a type of foreign investment where investors build new production units in a country; (ii) Non-greenfield FDI, which is a type of foreign investment where investors make acquisitions of ownership from a domestic company. According to Carbaugh (2010), FDI is often associated with multinational companies (MNEs). The term generally refers to a situation where companies from a home country expand their production activities in another country but remain under the rule of law of the host country of the investment.

In general, FDI provides many benefits for both the home and the host country. According to Appleyard and Field (2013), countries with an open economy tend to enjoy higher levels of private investment, which are the main determinants of economic growth and job creation. The specific benefit of FDI for the host country mostly comes from its spillover effects such as backward and upward linkages of production, as well as technological transfers (Markusen and Venables, 1999). Feldein (2002) mentioned several benefits of FDI which are: (i) reducing the risk of capital ownership through FDI diversification; and (ii) integration of global markets in the formation of corporate governance, accounting rules, and legality.

Based on the work of North (1990) and Rutherford (2001), the quality of institutions of the host countries is a major indicator that explains economic growth and GDP per capita variation across countries. Institutional quality affects economic activity through the cost of production and transactions. The transaction costs are related to the economic exchange, i.e. the costs measured in terms of value being exchanged, and costs to protect and determine property rights. Meanwhile, institutional quality also affects the cost of production by inhibiting the supply chains. A long delay in obtaining business permits may escalate the cost of production and reduce competitiveness.

According to Fabry and Zeghni (2011), institutions are commonly categorized into two broad categories namely: informal and formal institutions. Furthermore, formal institutions consist of four different types of rule of law (i) institutions as market creators that protect property rights and push fair contracts; (ii) institutions as market regulators that reduce externalities and imperfect information; (iii) institutions as market stabilizers which help in reducing macroeconomic instability (inflation, exchange rates, trade policies or the banking system); (iv) institutions as market legalizations that support social protection and regulate social conflicts (Rodrik et al., 2004). Based on this description, the institution is a powerful tool to create favorable socioeconomic conditions for conducive investments. Knowles and Weatherston (2006) describe informal institutions as a type of institution based on culture, mentality, habits, beliefs, norms, codes of ethics, and even nationalism or religion. Informal institutions are the basis for explaining the differences in income and development in some developing countries.

The inability to provide high institutional quality (institutional uncertainty) often negatively affects the overall investment climate. A low investment climate might cause a high-cost economy which leads to economic inefficiency. Effective institutions, on the other hand, will reduce transaction costs and production costs. Underdeveloped institutions mostly produce unclear regulatory frameworks, complicated bureaucracies, and high levels of corruption that hamper FDI inflows (Dumludag et al., 2007). Institutional considerations such as political, social, and macroeconomic stability, efficient bureaucracy, levels of corruption and criminality, and freedom of democracy are among several factors that reflect the institutional quality of the host country. This institutional quality to some extent will perform a key role in attracting FDI.

3. Methodology

This study applied panel data analysis which is conventionally considered suitable for dynamic analysis. In particular, the study utilizes the two-step system generalized method of moment (SGMM) to analyze how institutional quality affects the link between FDI and DI. The use of the system GMM will help to reduce the reverse causality between DI and FDI as well as between DI and institutional quality. For the sample, 21 out of 27 developing and emerging economies in Asia were selected based on the qualifications specified by the International Monetary Fund (IMF). These countries include; Vietnam, Vanuatu, Timor-Leste, Thailand, Sri Lanka, Philippines, Palau, Nepal, Myanmar, Mongolia, Marshall Island, Maldives, Malaysia, Lao PDR, Indonesia, India, Fiji, China, Cambodia, Bhutan, and Bangladesh. The period for the study observations spans from 2011 to 2016.

This study utilizes two alternative dependent variables as proxies of domestic investment which are; DPI and GFCF. The variable DPI was derived from the reduction of GFCF from the FDI and public investment. The use of the GFCF as a proxy for the dependent variable was done following a study by (Farla et al., 2014). They stated that the formation of DPI data through the reduction of GFCF from FDI was invalid because it has a different measurement. The institutional quality indicators were taken from The Worldwide Governance Indicators (WGI). The details of how our empirical models were constructed are expressed in Models 1 to 4.

In models 1 and 2, the dependent variable is the Domestic Private Investment (DPI). Model 2 includes the interaction variables of FDI and world governance indicators.

$$dpi_{i,t} = \beta_0 + \beta_1 dpi_{i,t-1} + \beta_2 growth_{i,t} + \beta_3 fdi_{i,t} + \beta_4 public_{i,t} + \beta_5 wgi_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$dpi_{i,t} = \beta_0 + \beta_1 dpi_{i,t-1} + \beta_2 growth_{i,t} + \beta_3 fdi_{i,t} + \beta_4 public_{i,t} + \beta_5 wgi_{i,t} + \beta_6 wgi * fdi_{i,t} + \varepsilon_{i,t} \quad (2)$$

In models 3 and 4, the dependent variable is the Gross Fixed Capital Formation (GFCF). Model 4 includes the interaction variables of FDI and world governance indicators.

$$gfcf_{i,t} = \beta_0 + \beta_1 gfcf_{i,t-1} + \beta_2 growth_{i,t} + \beta_3 fdi_{i,t} + \beta_4 public_{i,t} + \beta_5 wgi_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$gfcf_{i,t} = \beta_0 + \beta_1 gfcf_{i,t-1} + \beta_2 growth_{i,t} + \beta_3 fdi_{i,t} + \beta_4 public_{i,t} + \beta_5 wgi_{i,t} + \beta_6 wgi * fdi_{i,t} + \varepsilon_{i,t} \quad (4)$$

where $dpi_{i,t}$ is the domestic private investment (% of GDP) of country i, at time t, $dpi_{i,t-1}$ is the lag of domestic private investment, $gfcf_{i,t}$ is the fixed gross capital formation, $gfcf_{i,t-1}$ refers to the lag of fixed gross capital formation, $growth_{i,t}$ is the real GDP growth rate, $fdi_{i,t}$ is the foreign direct foreign investment (% of GDP), $public_{i,t}$ represents the public investment (% of GDP), $wgi_{i,t}$ is the worldwide governance indicators proxy of institutional quality which includes; va the voice and accountability, ps political stability, ge government effectiveness, rq regulatory quality, rl rule of law, cc corruption control.

Each of the institutional factors above will have two values (i.e. 1 and 0). The value 1 represents high institutional quality and 0 indicates poor or low institutional quality. For instance, the control of corruption with a value of 1 means that a country has a strong commitment to eradicating corruption and vice versa.

Table 1. The Worldwide Governance Indicators (WGI)

Indicators	Variable	Definition
The procedure by which governments are selected, supervised, and changed.		
The voice and accountability	*VA*	Describe people's participation in a democracy such as elections, freedom of speech, independent press and media, and the freedom of association.
Political stability and absence of violence/terrorism	*PS*	Describe the role of institutions that are connected to political stability and the probability of government being overthrown unconstitutionally (riot) with political or terrorist motives.
The ability of the government to successfully formulate and implement good policies.		
Government Effectiveness	*GE*	Describe the role of government in carrying out its role effectively in ensuring the quality of public services and policy formulation and their implementation.
Regulatory Quality	*RQ*	Describe the government's ability to formulate and implement sound policies and regulations and encourage the development of the private sector.
The respect of citizens and the state for the institutions that govern economic and social interactions among them		
The rule of law	*RL*	Describe the role of government in upholding the law, particularly concerning the quality of public services, property rights, the judicial process, and the possibility of crime and violence.
Corruption control	*CC*	Describe the role of the government in combating fraud and corruption.

Source: Kaufmann et al. (2011).

According to Kaufmann et al. (2011), the Worldwide Governance Indicators (WGI) data were obtained from the measurements of thousands of variables originating from 31 different data sources. The WGI illustrates the quality of a government institution that is represented in 6 aggregate measurement groups. Data sources of the WGI comprise surveys of households and companies as a form of subjective assessment of various non-governmental organizations, providers of commercial business information, multilateral organizations, and many public sector organizations.

4. Results and Discussion

In this part of the analysis, we first explored the impact of FDI on DPI. As stated earlier, the variable DPI is obtained from the reduced GFCF from FDI and public investment and represented in terms of the percentage of Gross Domestic Product (GDP). Under this model, there will be two alternative sub-models: (i) model with interaction variable of FDI and institutional quality; and (ii) model without interaction variable. Overall, there will be 12 model variations that consist of 6 different models under the sub-model (i); and 6 different models under the sub-model (ii). This variation comes from the six WGI. The estimation results of the effect of FDI on DPI without interaction variable and with interaction variable are summarized in Tables 2 and 3, respectively.

Based on Tables 2 and 3, the coefficient of FDI varies across models. Nevertheless, the FDI coefficients are consistently negative and significant. The negative sign of FDI across models shows that the flow of FDI is crowding out the DPI. In other words, the higher the FDI, the smaller the proportion of domestic private investment. This finding is similar to the study conducted by Agosin and Machado (2005) which stated that the flow of FDI "held back" the growth of DPI in developing countries. The crowding-out phenomenon is often caused by the spillover effect of the FDI on economic efficiency. According to Farla et al. (2014), the presence of foreign companies (MNEs) may push inefficient domestic companies to leave the market. It implies that the presence of FDI creates efficiency in the production process. However, at the same time, the efficient production of FDI might leave behind the local companies to gain the overall market share of certain industries (Suyanto and Salim, 2013). Efficient production of MNEs at some point may create monopoly power (natural monopoly) so that local companies would be out of business. Another channel that may explain this phenomenon is the inability of local companies to support the backward and upward linkages of MNEs due to the large gap in knowledge, technology as well as production capacity (Szkorupová, 2015).

Further analysis reveals that in general, good institutional quality has a positive effect on DPI. Looking at the coefficient of the Worldwide Governance

Indicators (WGI) in Table 2 indicates that all coefficients assert a positive and statistically significant effect on DPI. This implies that high institutional quality supports the growth of DPI in 21 emerging and developing countries in Asia. The high institutional quality proxied by WGI shows the governments' ability to create conducive business environments. The conducive business environment reflects the minimum potential costs of running businesses so that it attracts more DPI. Morrissey and Udomkerdmongkol (2012) stated that total investment i.e. both domestic investment and FDI are likely to be higher under a government regime with good institutional quality which is reflected in their policies.

Table 2. Model Estimate for DPI Using Two-Step System-GMM without Interaction Variable

Variables	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
L.DPI	0.480***	0.455***	0.167***	0.311***	0.480***	0.130***
	(0.0274)	(0.0309)	(0.0615)	(0.0444)	(0.0177)	(0.0255)
Growth	0.923***	1.005***	0.697***	0.738***	0.939***	0.980***
	(0.102)	(0.140)	(0.236)	(0.179)	(0.114)	(0.152)
FDI	-0.570***	-0.610***	-0.605***	-0.604***	-0.561***	-0.741***
	(0.0282)	(0.0390)	(0.0850)	(0.0551)	(0.0277)	(0.0358)
Public	-0.108***	-0.117***	-0.302***	-0.192***	-0.107***	-0.153***
	(0.0390)	(0.0322)	(0.0511)	(0.0486)	(0.0267)	(0.0559)
VA	2.323*					
	(1.223)	--	--	--	--	--
PS		2.459***				
	--	(0.724)	--	--	--	--
GE			10.06***			
	--	--	(2.071)	--	--	--
RQ				7.113***		
	--	--	--	(1.432)	--	--
RL					1.854***	-
	--	--	--	--	(0.630)	--
CC						4.158***
	--	--	--	--	--	(1.215)
Hansen-test	11.02	13.39	13.57	14.91	12.07	12.93
p-value	(0.356)	0.203	(0.194)	(0.136)	(0.280)	(0.227)
AR (2)	-1.21	-1.29	-1.40	-1.43	-1.19	-0.97
p-value	(0.225)	(0.196)	(0.163)	(0.154)	(0.235)	(0.330)
Model overall p-value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	105	105	105	105	105	105
Number of codes	21	21	21	21	21	21
No. of Instruments	16	16	16	16	16	16
Time effect	Yes	Yes	Yes	Yes	Yes	Yes

Source: Research finding.

Note: ***, **, * indicate the significance level at one percent, five percent, and ten percent respectively. Robust standard errors were in parenthesis.

Looking at Table 3, the interaction variable of FDI and the worldwide governance indicators show the moderation of the two independent variables on domestic private investment. Interaction variables are used in analysing the effect of institutional quality on the relationship between domestic private investment and FDI. The estimation results show that the coefficients vary across models and they are statistically significant in each model. For instance, the variable voice and accountability show a positive effect on the DPI. This explains that high institutional quality in terms of voice quality and accountability would likely cause a crowding-in effect on DPI. In addition, the interaction variable between FDI and voice and accountability indicator also shows a positive and statistically significant coefficient. The positive and statistically significant coefficient values of both variables show that the crowding-out effect of FDI can be reduced with high institutional quality related to voice and accountability.

The indicators of regulatory quality, government effectiveness, political stability, rule of law, and corruption control independently show the crowding-in effects. Meanwhile, except for FDI and voice and accountability interaction, the coefficient of the interaction term between the FDI and each indicator of political stability, government effectiveness, regulatory quality, rule of law, and corruption control revealed crowding-out effects on DPI. The negative value and higher or lower coefficient of interaction variables compared to the FDI coefficient indicate that the crowding-out effect of FDI increases or decreases with high institutional quality in terms of political stability, government effectiveness, regulatory quality, rule of law, and corruption control.

In Table 3, our estimated result shows that government effectiveness has the highest coefficient compared to other indicators. This reflects that a country with high government effectiveness attracts more domestic private investment through the efficiency of the regulatory system. Moreover, the negative and the highest value of the FDI coefficient is found in the model with the control of corruption. This implies that the crowding-out effect of FDI on this indicator is relatively strong. The control of corruption indicator itself shows a positive coefficient and is relatively low compared to other institutional indicators in crowding in the DPI. Furthermore, the coefficient of FDI interaction with the control of corruption variable is negative and decreases quite dramatically. It can be interpreted that with the high control of corruption, the countries attract only a small portion of foreign investors so that the crowding-out effect of FDI on DPI decreases. Conversely, the volume of domestic private investment has increased along with the confidence of domestic investors in the role of institutions in limiting the possibilities for elites and entrepreneurs to commit fraud.

Table 3. Model Estimate for DPI Using Two-Step System-GMM with Interaction Variable

Variables	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
L.DPI	0.434***	0.331***	0.203***	0.269***	0.318***	0.287***
	(0.0317)	(0.0371)	(0.0613)	(0.0314)	(0.0276)	(0.0583)
Growth	0.934***	1.183***	0.810***	1.069***	1.107***	1.117***
	(0.122)	(0.197)	(0.161)	(0.126)	(0.132)	(0.175)
FDI	-0.617***	-0.253*	-0.134*	-0.466***	-0.467***	-0.642***
	(0.0512)	(0.142)	(0.0776)	(0.0804)	(0.0692)	(0.0593)
Public	-0.145***	-0.179***	-0.415***	-0.265***	-0.200***	-0.127***
	(0.0378)	(0.0571)	(0.0553)	(0.0566)	(0.0310)	(0.0295)
VA	2.352**					
	(0.977)	--	--	--	--	--
PS		2.446**				
	--	(0.981)	--	--	--	--
GE			11.48***			
	--	--	(1.908)	--	--	--
RQ				5.686***		
	--	--	--	(1.329)	--	--
RL					4.938***	
	--	--	--	--	(0.479)	--
CC						4.802***
	--	--	--	--	--	(1.216)
FDIVA	0.175*					
	(0.102)	--	--	--	--	--
FDIPS		-0.561***				
	--	(0.0960)	--	--	--	--
FDIGE			-0.655***			
	--	--	(0.0814)	--	--	--
FDIRQ				-0.253***		
	--	--	--	(0.0667)	--	--
FDIRL					-0.489***	
	--	--	--	--	(0.0421)	--
FDICC						-0.785***
	--	--	--	--	--	(0.138)
Hansen-test	12.95	11.15	12.91	12.00	11.88	13.22
p-value	(0.226)	(0.431)	(0.300)	(0.364)	(0.373)	(0.279)
AR (2)	-1.17	-1.48	-1.42	-1.28	-1.33	-1.33
p-value	(0.243)	(0.140)	(0.155)	(0.202)	(0.183)	(0.183)
Model overall p-value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	105	105	105	105	105	105
Number of codes	21	21	21	21	21	21
No. of Instruments	17	18	18	18	18	18
Time effect	Yes	Yes	Yes	Yes	Yes	Yes

Source: Research finding.

Note: ***, **, * indicate the significance level at one percent, five percent, and ten percent respectively. Robust standard errors were in parenthesis.

The political stability and rule of law show a positive and significant impact on the dependent variable. This indicates that high institutional quality which is represented in political stability and rule of law creates crowding-in effects. Conversely, the interactions between FDI with political stability and the rule of law indicate crowding-out effects on domestic private investment. The estimated results in the models with two indicators show negative FDI coefficients that are lower than the coefficients of interaction variables. However, except in Models 1 and 7 of Tables 2 and 3, the crowding-out effect of FDI decreases after introducing the interaction variables. This phenomenon is contrary to the hypothesis that improving the quality of institutions will attract significant foreign investors to invest their capital which in turn has crowding-in effects on domestic private investment. These estimation results have suggested that the quality of institutions significantly affects the nexus between domestic private investment and FDI.

Table 4. Model Estimate for GFCF Using Two-Step System GMM without Interaction Variable

Variables	**Model 13**	**Model 14**	**Model 15**	**Model 16**	**Model 17**	**Model 18**
L.GFCF	0.752***	0.797***	0.695***	0.646***	0.614***	0.634***
	(0.0210)	(0.0253)	(0.0297)	(0.0206)	(0.0369)	(0.0358)
Growth	0.303***	0.226***	0.224***	0.249***	0.381***	0.348***
	(0.0338)	(0.0473)	(0.0729)	(0.0509)	(0.0449)	(0.0500)
FDI	0.163***	0.170***	0.235***	0.182***	0.176***	0.175***
	(0.0120)	(0.0136)	(0.0319)	(0.0174)	(0.0236)	(0.0177)
Public	0.170***	0.223***	0.180***	0.222***	0.266***	0.261***
	(0.0230)	(0.0323)	(0.0298)	(0.0248)	(0.0347)	(0.0478)
VA	1.022**					
	(0.452)	--	--	--	--	--
PS		-2.447***				
	--	(0.736)	--	--	--	--
GE			3.643***			
	--	--	(1.334)	--	--	--
RQ				3.826***		
	--	--	--	(0.715)	--	--
RL					2.568***	
	--	--	--	--	(0.915)	--
CC						2.755***
	--	--	--	--	--	(0.716)
Hansen-test	13.81	14.48	13.13	14.14	13.72	13.52
p-value	(0.182)	(0.152)	(0.216)	(0.167)	(0.186)	(0.196)
AR (2)	0.51	0.69	0.98	0.49	0.31	0.20
p-value	(0.612)	(0.491)	(0.327)	(0.627)	(0.759)	(0.841)
Model overall p-value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	105	105	105	105	105	105

Number of codes	21	21	21	21	21	21
No. of Instruments	16	16	16	16	16	16
Time effect	Yes	Yes	Yes	Yes	Yes	Yes

Source: Research finding.

Note: ***, **, * indicate the significance level at one percent, five percent, and ten percent respectively. Robust standard errors were in parenthesis.

Table 5. Model Estimate for GFCF Using Two-Step System GMM with Interaction Variable

Variables	**Model 19**	**Model 20**	**Model 21**	**Model 22**	**Model 23**	**Model 24**
L.GFCF	0.631***	0.812***	0.725***	0.444***	0.503***	0.558***
	(0.0459)	(0.0217)	(0.0468)	(0.0291)	(0.0474)	(0.0478)
Growth	0.371***	0.299***	0.266***	0.241**	0.484***	0.407***
	(0.0665)	(0.0408)	(0.0443)	(0.119)	(0.0947)	(0.111)
FDI	0.119***	0.452***	0.391***	0.366***	0.261***	0.137***
	(0.0431)	(0.0183)	(0.0669)	(0.140)	(0.0467)	(0.0421)
Public	0.281***	0.159***	0.115***	0.401***	0.386***	0.379***
	(0.0488)	(0.0272)	(0.0275)	(0.0533)	(0.0467)	(0.0861)
VA	1.539*					
	(0.864)	--	--	--	--	--
PS		-1.183**				
	--	(0.502)	--	--	--	--
GE			3.768***			
	--	--	(1.151)	--	--	--
RQ				6.232***		
	--	--	--	(1.534)	--	---
RL					3.530***	
	--	--	--	--	(0.772)	--
CC						3.553***
	--	--	--	--	--	(1.195)
FDIVA	0.178*					
	(0.102)	--	--	--	--	--
FDIPS		-0.376***				
	--	(0.0313)	--	--	--	--
FDIGE			-0.323***			
	--	--	(0.0738)	--	--	--
FDIRQ				-0.245*		
	--	--	--	(0.145)	--	--
FDIRL					-0.275***	
	--	--	--	--	(0.0325)	--
FDICC						-0.431*
	--	--	--	--	--	(0.253)
Hansen-test	13.92	15.25	12.56	13.30	13.28	13.16
p-value	(0.177)	(0.123)	(0.250)	(0.207)	(0.209)	(0.215)
AR (2)	0.14	0.26	0.87	-0.81	-0.88	-0.90
p-value	(0.866)	(0.799)	(0.386)	(0.420)	(0.380)	(0.369)

Model overall p-value	0.000	0.000	0.000	0.000	0.000	0.000
Observations	105	105	105	105	105	105
Number of codes	21	21	21	21	21	21
No. of Instruments	17	17	17	17	17	17
Time effect	Yes	Yes	Yes	Yes	Yes	Yes

Source: Research finding.

Note: ***, **, * indicate the significance level at one percent, five percent, and ten percent respectively. Robust standard errors were in parenthesis.

As an extension of previous studies, this study analysed the robustness of the analysis by utilizing alternative dependent variables i.e. GFCF as a proxy of the total domestic private investment. The selection of GFCF was done following studies by Farla et al. (2014), Szkorupová (2015), and Pilbeam and Oboleviciute (2012) who criticized the use of DPI as obtained by reducing GFCF with public investment and FDI. The use of DPI as the dependent variable should be precautious because the figure of DPI comes from different measurements. According to Elheddad (2019), the proxy for domestic investment is quite diverse, including the use of GFCF which includes domestic private investment and public investment. The GFCF represents the total domestic investment in a country without considering private sector finance sources. An asset of a domestic private company can be owned by domestic and foreign investors through FDI and loans. In other words, in an examination of the effect of FDI inflows on DPI, a rise in FDI can increase the overall volume of GFCF. When the stock of FDI is greater relative to the domestic investment, most of the GFCF will be in foreign ownership (Farla et al., 2014).

The estimated results from the model of GFCF using the two-step system GMM were summarized in Tables 4 and 5. Overall, the model estimate with the GFCF variable indicates significant changes relative to the previous estimate with DPI as the dependent variable. The most striking difference is the sign of FDI variables. Previously, the estimated results in Tables 2 and 3 indicate that the variable FDI has consistently negative signs. However, in the model with GFCF as the regressand, the sign of variable FDI becomes positive and significant. These findings imply that the presence of FDI exhibits the crowding-in effects on domestic investment. This contradictory finding might be explained by the fact that increasing FDI, is followed by rising domestic private investment regardless of whether the assets of a company are coming from foreign or domestic investors. To conclude, it can be seen that there is little evidence that the existence of FDI will substitute the DPI.

Furthermore, the estimation of the interaction variable between FDI and institutional indicators using GFCF as the dependent variable is not much different

from the previous alternative models. The institutional quality as measured by voice and accountability, for instance, shows a significant positive impact. The interaction variable between FDI and voice and accountability also reveals a similar pattern. This suggests that a country with high institutional quality in terms of voice and accountability leads to a crowding-in effect on total investment.

Moreover, the political stability indicator shows a negative coefficient and it has a significant impact on GFCF. This suggests that high institutional quality in terms of political stability leads to lower domestic investment. The interaction variable between FDI with political stability also shows a significant negative effect. The negative effect of political stability as observed in Tables 4 and 5 demonstrates that FDI independently causes a crowding-in effect on GFCF but the effect changes to be a crowding-out effect after introducing the interaction variable of FDI with political stability indicators.

The estimated results of government effectiveness, rule of law, regulatory quality, and corruption control show positive and significant coefficients. Conversely, the interaction variables between FDI and government effectiveness, rule of law, regulatory quality, and corruption control show a significant negative effect. The positive sign and statistically significant coefficient of the four institutional indicators indicate the crowding-in effects on the GFCF.

It turns out that the effects of institutional indicators and FDI are positive and significant. The coefficients, however, are higher relative to the interaction variables between FDI and institutional indicators. This implies that the influence of institutional quality indicators and FDI on domestic investment as measured by GFCF is not consistent enough. In short, it can be concluded that the effect of high institutional quality on the link between FDI and domestic investment is less strong. According to Farla et al. (2014), the negative relationship of the interaction between FDI and institutional indicators is evidence of the possibility that foreign investors have an investment preference in a certain industry.

5. Conclusion

Existing empirical evidence of the nexus between foreign direct investment (FDI) and domestic investment exhibits a contradictory finding. Moreover, it is less clear how the institutional quality determines this nexus. With this, therefore, this study focuses on two main objectives; *First*, to investigate the nexus between FDI and domestic investment by utilizing two different dependent variables which are; domestic private investment (DPI) and gross fixed capital formation (GFCF) for 21 developing and emerging economies in Asian continent during the period 2011-2016. *Second*, to explore the role of institutional quality in determining this nexus.

By using the two-step system generalized method of moment (SGMM), our empirical strategy demonstrates that the role of institutional quality in affecting the

link between FDI and domestic investment varies across models depending on the chosen dependent variable i.e. DPI or simply the GFCF. In the model with domestic private investment (DPI) as the dependent variable, the presence of FDI leads to a crowding-out effect on domestic investment. Conversely, for the model with GFCF as the dependent variable, the FDI turns out to complement the role of domestic investment or exhibit crowding-in effects on domestic investment. In short, the conclusion of whether the presence of FDI crowds out or crowds in domestic investment depends upon the type of dependent variable.

In addition, high institutional quality improves the performance of the domestic investment. Specifically, by using DPI as the dependent variable, some institutional factors reduce the crowding-out effects of the FDI. Nevertheless, some of these institutional factors also increase the crowding-out effect of FDI on domestic investment. For the GFCF models, most of the institutional quality factors indicate the crowding-in effects. However, except for FDI and the voice and accountability interaction, all variable interactions demonstrate the crowding-out effects. This might be explained by the investors' preference for financing the private domestic sector so that the institutional aspect does not matter in determining the nexus between FDI and domestic investment.

Based on the empirical findings we, therefore, recommend that a policy framework aimed at increasing the level of domestic investment as measured by both DPI and GFCF should be accompanied by an efficient institutional environment because they shaped the effect of FDI on domestic investment. Moreover, policy measures are also needed to augment the positive role of institutional quality in such a way that the crowding-out effect of the simultaneous increase in FDI and institutional quality will augur well for domestic investment.

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