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FDI Inflows – Domestic Investment Relationship in Developing Countries: Does the Governance Environment Matter?

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Abstract

FDI inflows play a crucial role in the development agenda of developing countries. Attracting more FDI inflows is one of the priority policies to promote economic growth and create more jobs in these countries. However, FDI inflows can crowd out/in domestic investment, and thus the role of the governance environment is mentioned as a mitigating factor for the negative influence of FDI inflows on domestic investment. This study empirically examines the role of the governance environment in the relationship between FDI inflows and domestic investment for a panel data of 93 developing countries using the two-step system GMM Arellano-Bond estimators. The robustness of estimates is checked by the one-step system GMM Arellano-Bond estimators. The estimated results indicate FDI inflows and governance reduce domestic investment but their interaction stimulates it. Besides, economic growth, trade openness, and infrastructure are positive determinants of domestic investment in these countries. These findings suggest some important policy implications for governments in developing countries in attracting FDI inflows.

Keywords: FDI, domestic investment, governance environment, developing countries, system GMM estimators.

1. Introduction

The relationship between FDI inflows and domestic investment is one of the hotly debated topics among economists and policymakers. A large strand of related literature inspired by the seminal work of Agosin and Machado (2005) has investigated this relationship, attempting to examine substitutability or complementarity. FDI is a crucial capital source to promote economic growth and development in both developed and developing countries. The great contribution of FDI inflows in host countries is innovative capacity, capital accumulation, know-how acquisition, and technology transfer (Agosin & Machado, 2005). Thus, the majority of countries always try to adjust and improve the governance environment and policies to attract more FDI inflows. In this study, the governance environment is defined by six dimensions of governance from the World Bank project (Kaufmann, Kraay, & Mastruzzi, 2011). According to the approach of Li, Park, and Li (2004), developed countries are those with good governance environment (rule-based governance) while developing countries are those with bad governance environment (relationship-based governance). Meanwhile domestic investment capital, especially private investment, plays a key role in boosting economic growth, creating employment, and thus stabilizing social security (Khan & Reinhart, 1990).

Despite its great contribution to economic growth and development in host countries, FDI has some certain influences on domestic investment. On the one hand, FDI can support domestic investment through cooperation opportunities. One example can be an investment joint-venture between foreign investors and domestic enterprises. In other cases, domestic enterprises can supply raw materials and do outwork for FDI investors and receive the transfer of modern technologies from them to cut production costs. This is the crowding-in impact of FDI on domestic investment (Agosin & Machado, 2005). On the other hand, if foreign investors use domestic credit in host countries to finance their business operations, then it puts high pressure on domestic interest rates, which makes domestic investors give up business

opportunities. This is the crowding-out impact of FDI on domestic investment (Delgado & McCloud, 2016). In particular, the theoretical framework written by Morrissey and Udomkerdmongkol (2012) shows that the FDI – domestic investment relationship has been influenced by the institutional setting in host countries. They argue that in case a capital-unfriendly regime (poor institutional environment) dominates, then capital source for the development of the private sector will not be encouraged. Domestic companies will seek a partner from other countries and attract FDI inflows. Hence, FDI inflows will be a relatively important capital source to substitute domestic investment.

Given the relevance of this topic, the most significant contributions to the related literature are Morrissey and Udomkerdmongkol (2012) and Farla, De Crombrugghe, and Verspagen (2016). In comparison with these works, this current study highlights three important aspects. First, we use the variable domestic investment instead of private investment, which leads to the different impact of the governance environment on domestic investment. Second, the bias in their estimates was further exacerbated by the problem of instrument proliferation in their system GMM Arellano-Bond estimator specification, although it can be solved by applying the rule of thumb suggested by Roodman (2006) as shown in this study. Third, this study uses the two-step system GMM Arellano-Bond estimator (two-step S-GMM) for estimation and the one-step system GMM Arellano-Bond estimator (one-step S-GMM) for robustness check while Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016) apply one-step S-GMM for estimation without robustness check. Therefore, the paper will attempt at addressing these problems to fill this gap in the related literature.

Motivated by the fact that FDI plays a crucial role in the economic process of developing countries and the governance environment decisively contributes to the relationship between FDI and domestic investment, we empirically investigate the effects of FDI, governance, and their interaction on domestic investment using panel data from 93 developing countries over the period 2002 – 2018 using two-step S-GMM. The robustness of estimates is

checked by one-step S-GMM. Consistent with the findings in Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016), FDI in our study also crowds out domestic investment. However, unlike Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016), our study indicates that governance reduces domestic investment while the interaction term stimulates it.

The paper is constructed in the following way. Section 2 is a literature review that focuses on the relationship between FDI and domestic investment. The model specification and research data are presented in Section 3 that especially emphasizes the characteristics and appropriateness of the system GMM Arellano-Bond estimators. Section 4 shows the empirical results derived from the two-step S-GMM estimation process and the robustness check by one-step S-GMM. The final section concludes and suggests some important policy implications from the findings in Section 4.

2. Literature Review

Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016) are the most considerable investigations in the related literature in which they consider the influence of the governance environment on the FDI and private-investment relationship. The remaining studies mainly focus on the relationship between FDI and domestic investment/private investment while Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016) introduce the governance environment into this relationship. They both use one-step S-GMM to examine the influences of FDI, governance, and their interaction on private investment for a panel data of 46 developing countries. They conclude that FDI crowds out private investment, supporting the "crowd-out hypothesis".

In line with Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016), Kim and Jung-Soo (2003), Titarenko (2006), Mutenyo and Asmah (2010), Eregha (2012), Szkorupová (2015) show that FDI crowds out domestic investment. Wang (2010) notes that the inward FDI decreases domestic investment while the cumulative FDI over time seems to stimulate

it using the estimation methods of fixed effects, random effects, and GMM Arellano-Bond estimator. Similarly, Pilbeam & Oboleviciute (2012) apply the one-step GMM estimator for a group of 26 EU countries from 1990 to 2008 and find a significant crowding-out effect of FDI on domestic investment for the older EU14 member states.

In contrast, some investigations support the "crowd-in hypothesis" (Ang, 2009; Ang, 2010; Desai, Foley, & Hines, 2005; Ndikumana & Verick, 2008; Prasanna, 2010; Tang, Selvanathan & Selvanathan, 2008). Al-Sadig (2013) indicates that FDI promotes private investment using the system GMM estimator for a sample of 91 developing countries from 1970 to 2000. The findings in Al-Sadig (2013) show that the positive effects of FDI in the sample of low-income countries depend upon the availability of human capital in the host country. In the same vein, Munemo (2014) reports that the complementarity between FDI and domestic investment is strongly conditional on business start-up regulations in host economies for a group of 139 countries over the period 2000 – 2010 using the two-step difference GMM estimator. Munemo (2014) confirms that reforms in these regulations can improve the complementarity between foreign and domestic investment. Recently, Boateng, Amponsah, and Annor Baah (2017) examine the crowding-in effect of FDI on domestic investment for a sample of 16 sub-Sahara African countries from 1980 to 2014 via fixed effect, pooled OLS, and FMOLS techniques. More recently, Jude (2019) notes that FDI crowds in domestic investment for a sample of 10 Central and Eastern European countries over the period 1995 – 2015 using the one-step system GMM estimator.

Meanwhile, some researchers present mixed evidence for this FDI – domestic investment relationship (Agosin & Machado, 2005; Ahmed et al., 2015; Apergis et al., 2006; Mišun & Tomšk, 2002; Onaran, Stockhammer, & Zwickl, 2013;). Lin and Chuang (2007) present that FDI stimulates domestic investment of the larger firms while FDI reduces it in the case of the smaller firms in Taiwan over the periods of 1993 – 1995 and 1997 – 1999 via the Heckman 2SLS estimator. Meanwhile, Tan, Goh, and Wong (2016) show that

FDI has a crowding-in effect on gross domestic investment in the long run for a group of 8 ASEAN countries over the period of 1986 – 2011 using the PMG estimator. In the same vein, Chen, Yao, and Malizard (2017) show a neutral relationship between FDI and private investment in China from 1994Q1 to 2014Q4 using the ARDL test. By referring to the role of the entry mode decided by FDI investors, they find that equity joint venture crowds in private investment, while wholly foreign-funded enterprises crowd it out.

3. Model Specification and Data

3.1 Model Specification

Based on the work developed by Agosin and Machado (2005), the empirical equation is extended as follows:

$$DIN_{it} = \beta_0 + \beta_1 DIN_{it-1} + \beta_2 FDI_{it} + \beta_3 GOV_{it} + \beta_4 (FDI \times GOV)_{it} + X_{it}\beta' + \eta_i + \xi_{it} \quad (1)$$

where subscript *i* and *t* are the country and time index, respectively. DIN_{it} is domestic investment, DIN_{it-1} is proxy for the initial level of domestic investment, FDI_{it} is net FDI inflow, and GOV_{it} is the governance environment. Included in this variable are six dimensions of governance which are regulatory quality, rule of law, voice and accountability, control of corruption, government effectiveness, and political stability. These six dimensions are examined separately in our analysis. The fourth term, $(FDI \times GOV)_{it}$, is the interaction between FDI and governance. X_{it} is a set of control variables such as economic growth, trade openness, inflation, and infrastructure; η_i is an unobserved time-invariant, country-specific effect and ζ_{it} is an observation-specific error term; β_0, β_1, β_2, β_3, β_4, and β' are estimated coefficients.

We apply Equation (1) to investigate the effects of FDI, governance, and their interaction on domestic investment for the group of 93 developing countries. In this study, six dimensions of governance constructed by the

Worldwide Governance Indicators project will be used to define the governance environment (Kaufmann et al., 2011). The World Bank WDR (2017) emphasizes that "Governance is the process through which state and non-state actors interact to design and implement policies within a given set of formal and informal rules that shape and are shaped by power" (World Bank, 2017, p. 3). Six dimensions of governance are measured in the standard normal units of the governance indicator, ranging from around –2.5 to 2.5. In particular, Hope (2009) notes that the lack of good governance in most developing countries leads to adverse effects on the economic development perspective; thus, enhancing the governance environment in these countries plays a crucial role in the development agenda. Hope (2009) insists that good governance greatly contributes to the creation of constructive governments with the capacity to implement development policies.

There are four serious problems of econometrics from estimating Equation (1). First, some variables such as economic growth, inflation, and infrastructure may be endogenous. These variables can correlate with the error term η_i, which leads to an endogeneity problem. Second, some unobserved time-invariant, country-specific characteristics (fixed effects) like geography and anthropology can correlate with the independent variables. These fixed effects exist in the error term η_i. Third, the presence of the lagged dependent variable DIN_{it-1} results in a high autocorrelation. Finally, the panel data has a short observation length (T = 17) and a large unit of countries (N = 93). These problems may cause the OLS estimator to be inconsistent and biased. The fixed-effects model (FEM) and the random-effects model (REM) cannot deal with the endogeneity and autocorrelation problems while the IV-2SLS estimator requires some suitable instrumental variables which are out of independent variables in the model. Therefore, we decide to select two-step S-GMM as suggested by Judson and Owen (1999) for estimation and one-step S-GMM for robustness check.

We use the general method of moments (GMM) Arellano and Bond (1991) estimators first proposed by Holtz-Eakin, Newey, and Rosen (1988) for

estimation. For Equation (1), we take the first difference to remove country-specific effects. Then, the regressors in first difference are used as instrumented by their lags under the assumption that time-varying disturbances in the original models are not serially correlated (Judson & Owen, 1999). This strategy is the difference GMM Arellano and Bond estimator (D-GMM), which is well-known to be able to deal with simultaneity biases in regressions.

Equation (1) can be transformed into an equation in first difference as follows:

$$\begin{aligned} DIN_{it} - DIN_{it-1} &= \beta_1(DIN_{it-1} - DIN_{it-2}) + \beta_2(FDI_{it} - FDI_{it-1}) \\ &+ \beta_3(GOV_{it} - GOV_{it-1}) + \beta_4[(FDI \times GOV)_{it} \\ &- (FDI \times GOV)_{it-1}] + (X_{it} - X_{it-1})\beta_4' + (\xi_{it} - \xi_{it-1}) \end{aligned} \quad (2)$$

In case variables are persistent, their past values indicate little information about their future changes, making their lags be weak instruments for their differenced series. Thus, Arellano and Bover (1995) suggest a combination of Equation (1) and Equation (2) to form a system of two equations, an equation in difference series instrumented by lagged levels and an equation in levels instrumented by lagged differences, to which GMM is applied. It is known as the system GMM Arellano and Bond estimator (S-GMM), a strategy which can enhance the efficiency via its reduction in biases and solve the problem of the weak instrument in D-GMM (Blundell & Bond, 1998). The consistency of S-GMM is based on the assumption that the error terms are uncorrelated, the instruments are valid, and the changes in additional instruments are not correlated with country fixed effects.

In comparison with one-step S-GMM, two-step S-GMM are more asymptotically efficient. However, the application of two-step S-GMM in small samples, as in our study, has some problems (Roodman, 2006). These problems are set up by the proliferation of instruments, which quadratically increase as the time dimension increases. It can cause the number of instruments to be

very large relative to the number of countries. To avoid it, the rule of thumb should be applied to maintain the number of instruments less than or equal to the number of countries (Roodman, 2006).

The validity of instruments in S-GMM and D-GMM is assessed through the Sargan, Hansen, and Arellano-Bond tests. The Sargan and Hansen tests state a null hypothesis that the instrument is strictly exogenous, which means that it does not correlate with errors. The Arellano-Bond test is used to detect the autocorrelation of errors in first difference. Thus, the test result of first autocorrelation of errors, AR(1) is ignored while the second autocorrelation of errors, AR(2), is tested on the first difference series of errors to detect the phenomenon of first autocorrelation of errors, AR(1).

3.2 Data

The variables are FDI, domestic investment, six dimensions of governance, real GDP per capita, trade openness, inflation, and infrastructure. Data are taken from the World Bank World Development Indicators (WDI) and Worldwide Governance Indicators (WGI) database. The research sample contains 93 developing countries[1] from 2002 to 2018.

The definitions and descriptive statistics of the data are presented in Appendix A. The results in Table A2 indicate that the governance environment score in the group of 93 developing countries is relatively low, suggesting that most developing countries have a poor governance environment. This is

[1] Albania, Algeria, Argentina, Armenia, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bhutan, Bolivia, Bostawa, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Chad, Chile, China, Colombia, Comoros, Costa Rica, Cote d'Ivoire, Dominican Republic, Ecuador, Arab Rep. Egypt, El Salvador, Eswatini, The Gambia, Georgia, Ghana, Guatemala, Guinea, Honduras, Hungary, India, Indonesia, Islamic Rep. Iran, Jordan, Kazakhstan, Kenya, Lao PDR, Latvia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Montenegro, Morocco, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, North Macedonia, Oman, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, South Africa, Sri Lanka, Sudan, Tajikistan, Tanzania, Thailand, Timor-Leste, Togo, Tonga, Turkey, Uganda, Uruguay, Uzbekistan, and Vietnam.

consistent with the findings of Li (2003) and Li and Filer (2007) who reported that most developing countries operate under relation-based governance. Li (2003) emphasizes that, "In catching-up economies, there is generally no rule-based governance; hence relation-based governance is the only available mechanism to enforce agreements. Thus, investing in relations can be profitable and rational, especially in developing countries," (page 658). Li and Filer (2007) argue that the influence of governance environment on investment behavior is established on the institutional approach to economic activities. Social institutions promote or hinder economic activities by reducing or increasing transaction costs. Li et al. (2004) note that the developing countries with poor governance environments (relation-based governance) seem to have a non-transparent legal system in which the judicial system is not independent of political influence; laws and rules are arbitrarily interpreted, and the state cannot impartially and efficiently enforce the public laws.

4. Empirical Results and Discussion

4.1 S-GMM Estimates

The estimation results are given in Table 1 (without the interaction term) and Table 2 (with the interaction term). Each column in each table is the model in correspondence with each dimension of governance. In all estimation procedures, we detect that inflation is endogenous, thus we use inflation as instrumented in the GMM-style and the remaining variables (domestic investment, FDI, governance, economic growth, trade openness, and infrastructure) as instruments in the IV-style.

The estimated results across all models in Table 1 indicate that FDI crowds out domestic investment, supporting the substitutability hypothesis. This finding can be found in Eregha (2012), Kim and Jung-Soo (2003), Mutenyo and Asmah (2010), Pilbeam & Oboleviciute (2012), Szkorupová (2015), Titarenko (2006), Wang (2010), especially Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016). Unlike the results in Morrissey and Udomkerdmongkol

(2012) and Farla et al. (2016), the results in this study indicate that better governance reduces domestic investment. Is it unreasonable? In consideration of the theoretical framework developed by Morrissey and Udomkerdmongkol (2012), the capital-unfriendly regime (poor institutional environment) in developing countries will not encourage capital source for the development of the private sector, and thus the governance environment in these countries will not support domestic investment. In another respect, the domestic investment includes public investment and private investment. Grigoli and Mills (2014) point out that improving the governance environment in developing countries will reduce public investment with the hypothesis that government officials use public investment as a means of rent-seeking. In particular, Tanzi and Davoodi (1998) and Haque and Kneller (2015) emphasize that corruption (poor governance) leads to an increase in public investment and that reforming governance environment will eliminate corruption and thus reduce public investment. Consequently, improving the governance environment can reduce domestic investment.

However, the estimated results in Table 2 show that the interaction between FDI and governance stimulates domestic investment. On the one side, reforming the governance environment in developing countries may reduce domestic investment; but, on the other side, it may encourage FDI inflows into the sectors with private sector participation. The cooperation between foreign investors and domestic companies may form a joint venture between both foreign and domestic investors. In some cases, domestic investors can supply raw materials and do outwork for FDI enterprises and receive the transfer of modern technologies from them to cut production costs. As a result, the interaction between FDI and governance stimulates domestic investment.

In both Table 1 and Table 2, the results note that economic growth, trade openness, and infrastructure significantly foster domestic investment. Erden and Holcombe (2005), Dreger and Reimers (2016), and Muthu (2017) provide empirical evidence to support the positive impact of economic growth on domestic investment. An increase in a country's per capita income, on the

one hand, provides the capital source for domestic investment via savings; while on the other hand, it stimulates consumption demand, thus encouraging domestic investment in production. Meanwhile, Mohsen (2015) shows that the positive effect of trade openness in the case of Syria. Economic openness of a country will help the domestic private sector have favorable conditions to access capital sources from other countries through the issuance of bonds and stocks in the stock markets in these countries. Similarly, the provision of primary infrastructures such as schools and health facilities, telecommunication networks, and roads are significant to promote domestic investment. The development of infrastructure will make the production and consumption of goods and services easier, thus encouraging domestic investment.

Table 1. FDI, governance, and domestic investment: two-step S-GMM, 2002 – 2018

Variables	GOV1	GOV2	GOV3	GOV4	GOV5	GOV6
	Dependent variable: Domestic investment (% GDP)					
Domestic investment (-1)	0.613***	0.611***	0.713***	0.625***	0.612***	0.721***
	(0.053)	(0.058)	(0.048)	(0.052)	(0.057)	(0.056)
FDI	-0.760***	-0.754***	-0.788***	-0.790***	-0.758***	-0.810***
	(0.051)	(0.052)	(0.056)	(0.057)	(0.052)	(0.063)
Governance	-1.930***	-2.533***	-1.222***	-2.949***	-1.924***	-0.811**
	(0.576)	(0.693)	(0.409)	(0.554)	(0.625)	(0.347)
Economic growth	0.004**	0.004***	-0.0006	0.002	0.004***	0.000
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Trade openness	0.050***	0.054***	0.091***	0.078***	0.054***	0.096***
	(0.009)	(0.008)	(0.012)	(0.012)	(0.009)	(0.015)
Inflation	0.028	0.004	0.024	-0.016	0.013	0.032
	(0.024)	(0.023)	(0.02)	(0.019)	(0.022)	(0.019)
Infrastructure	0.012***	0.011***	0.007**	0.010***	0.010***	0.005**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Instrument	32	32	32	32	32	30
Country/ Observation	93/1302	93/1302	93/1302	93/1302	93/1302	93/1209

AR(2) test	0.126	0.148	0.173	0.181	0.15	0.285
Sargan test	0.105	0.156	0.157	0.178	0.116	0.27
Hansen test	0.293	0.228	0.175	0.201	0.246	0.106

Notes: *** p<0.01 ** p<0.05 * p<0.1.
Source: Author's calculations.

Table 2. FDI, governance, and domestic investment: two-step S-GMM, 2002 – 2018

Variables	GOV1	GOV2	GOV3	GOV4	GOV5	GOV6
	Dependent variable: Domestic investment (% GDP)					
Domestic investment (-1)	0.616***	0.611***	0.707***	0.621***	0.621***	0.609***
	(0.054)	(0.050)	(0.049)	(0.051)	(0.058)	(0.051)
FDI	-0.708***	-0.746***	-0.872***	-0.836***	-0.747***	-0.820***
	(0.072)	(0.089)	(0.074)	(0.068)	(0.079)	(0.074)
Governance	-3.067***	-4.520***	-1.876***	-3.894***	-3.65***	-2.645***
	(0.685)	(0.739)	(0.481)	(0.691)	(0.799)	(0.697)
FDI* Governance	0.334**	0.609***	0.387***	0.315**	0.502***	0.334*
	(0.155)	(0.166)	(0.147)	(0.158)	(0.181)	(0.172)
Economic growth	0.003**	0.003**	0.0002	0.002	0.003*	0.004**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Trade openness	0.057***	0.068***	0.097***	0.082***	0.06***	0.058***
	(0.009)	(0.008)	(0.013)	(0.013)	(0.009)	(0.009)
Inflation	0.041*	0.022	0.04**	-0.007	0.033	0.029
	(0.022)	(0.022)	(0.020)	(0.020)	(0.023)	(0.025)
Infrastructure	0.011***	0.009**	0.002	0.008**	0.009**	0.011***
	(0.003)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)
Instrument	32	33	32	32	32	32
Country/ Observation	93/1302	93/1302	93/1302	93/1302	93/1302	93/1209
AR(2) test	0.241	0.721	0.448	0.408	0.974	0.258
Sargan test	0.178	0.116	0.16	0.177	0.25	0.128
Hansen test	0.276	0.251	0.284	0.247	0.236	0.183

Notes: *** p<0.01 ** p<0.05 * p<0.1.
Source: Author's calculations.

4.2 Robustness Check

To check the robustness of estimates, we re-estimate Equation (1) using one-step S-GMM. Similar to those in two-step S-GMM, the estimation procedures in one-step S-GMM detect that inflation is endogenous. The corresponding results across all models are reported in Table 3. In line with two-step S-GMM, the estimated results show that FDI and governance hinder domestic investment but their interaction promotes it. Besides, economic growth, trade openness, and infrastructure are also the significantly positive determinants of domestic investment. All findings are confirmed by a battery of diagnostic tests shown at the bottom in Table 3 (Sargan tests and Arellano-Bond AR(2) tests) suggesting that our one-step S-GMM estimates are relatively reliable.

Table 3. FDI, governance, and domestic investment: one-step S-GMM, 2002 – 2018

Variables	GOV1	GOV2	GOV3	GOV4	GOV5	GOV6
	Dependent variable: Domestic investment (% GDP)					
Domestic investment (-1)	0.511***	0.512***	0.522***	0.549***	0.519***	0.522***
	(0.014)	(0.014)	(0.018)	(0.015)	(0.014)	(0.015)
FDI	-0.759***	-0.808***	-0.900***	-0.844***	-0.803***	-0.836***
	(0.038)	(0.022)	(0.058)	(0.039)	(0.022)	(0.033)
Governance	-2.897***	-4.324***	-2.596***	-3.754***	-4.332***	-2.575***
	(0.932)	(1.001)	(0.753)	(0.803)	(0.905)	(0.854)
FDI* Governance	0.365*	0.439**	0.556**	0.315*	0.383**	0.315*
	(0.200)	(0.182)	(0.226)	(0.183)	(0.187)	(0.194)
Economic growth	0.008***	0.007***	0.008***	0.005***	0.006***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Trade openness	0.060***	0.062***	0.064***	0.088***	0.059***	0.053***
	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.005)
Inflation	0.023	0.004	0.024	-0.007	0.01	0.029
	(0.026)	(0.027)	(0.026)	(0.027)	(0.026)	(0.025)
Infrastructure	0.002*	0.008**	0.005	0.003	0.011***	0.010**
	(0.001)	(0.003)	(0.004)	(0.002)	(0.004)	(0.004)

Instrument	31	33	34	34	33	33
Country/ Observation	93/1209	93/1302	93/1395	93/1302	93/1302	93/1302
AR(2) test	0.711	0.707	0.241	0.562	0.953	0.346
Sargan test	0.127	0.116	0.106	0.115	0.243	0.117

Notes: *** p<0.01 ** p<0.05 * p<0.1.
Source: Author's calculations.

5. Conclusion and Policy Implications

Driven by the fact that FDI is an important capital for the economic process of developing countries and the governance environment plays a crucial role in the relationship between FDI and domestic investment, the paper attempts to empirically investigate the effects of FDI, governance, and their interaction on domestic investment using panel data from 93 developing countries over the period 2002 – 2018 using two-step S-GMM. The robustness of estimates is checked by one-step S-GMM.

The results show that FDI and governance decrease domestic investment in developing countries but their interaction increases it. These findings imply that research on the relationship between FDI inflow and domestic investment should take account of the governance environment. Economic growth, trade openness, and infrastructure are significant positive determinants of domestic investment in developing countries.

The findings in this study suggest some significant implications in the design, formulation, and implementation of policies relating to FDI inflows and the relationship between FDI and domestic investment. The implication is that a good governance environment not only enhances FDI inflows but sets up a helpful effect on this dynamic relationship as well. Therefore, governments in developing countries should strongly implement institutional reforms to attract more FDI inflows into the sectors that support the development of the domestic investment. We think that reforming the governance environment in developing countries will set up suitable conditions to attract more FDI

inflows and, in particular, these capital inflows crowd in rather than crowd out domestic investment. Over time, the continuous process of improving the governance environment will result in high economic growth, more jobs, high income, and high living standards for people from increasing FDI and domestic investment. More importantly, developing countries need to apply solutions to eliminate loopholes that enable government officials to seek rent. Future research should focus on the relationship between FDI and domestic investment by sector/industry under different governance environments.

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Appendix

Table A1. Data description

Variable	Definition	Type	Source
Domestic investment	Gross fixed capital formation (% of GDP) - FDI, net inflows (% of GDP)	%	World Development Indicators (WDI), World Bank
FDI	FDI, net inflows (% of GDP)	%	
Real GDP per capita	Real GDP per capita (constant 2010 US$)	ln	
Trade openness	Share of sum of exports and imports in GDP	%	
Inflation	Inflation, consumer prices (annual)	%	
Infrastructure	Fixed telephone subscriptions (per 100 people)	ln	
Regulatory Quality	Dimensions of governance	level	Worldwide Governance Indicators (WGI), World Bank
Rule of Law		level	
Voice and Accountability		level	
Control of Corruption		level	
Government Effectiveness		level	
Political Stability		level	

Table A2. Descriptive statistics for the group of 93 developing countries

Variable	Obs	Mean	Std. Dev.	Min	Max
Domestic investment (DIN)	1,581	19.510	8.677	-34.98	68.234
Foreign direct investment (FDI)	1,581	4.140	5.730	-41.50	55.075
GDP per capita (GDP)	1,581	5291.3	6181.07	210.80	37399.7
Trade openness (OPE)	1,581	75.877	34.374	0.167	210.37
Inflation (INF)	1,581	6.168	6.498	-30.24	63.292
Infrastructure (TEL)	1,581	11.794	11.542	0.057	52.407
Regulatory Quality (GOV1)	1,581	-0.386	0.644	-1.67	1.724
Rule of Law (GOV2)	1,581	-0.291	0.633	-1.77	1.572
Voice and Accountability (GOV3)	1,581	-0.347	0.825	-2.81	1.387
Control of Corruption (GOV4)	1,581	-0.241	0.662	-2.34	1.538
Government Effectiveness (GOV5)	1,581	-0.374	0.629	-1.73	1.555
Political Stability (GOV6)	1,581	-0.342	0.778	-2.23	1.292

Source: Author's calculations.