

## RESEARCH ARTICLE

# The relationship between FDI inflows and private investment in Vietnam: Does institutional environment matter?

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## Abstract

The recent literature confirms that foreign direct investment (FDI) can crowd out/in private investment. However, questions concerning the FDI–private investment relationship under different kinds of institutional environment is of great interest. This study examines the role of institutional environment in the FDI–private investment relationship in Vietnam using the two-step GMM Arellano–Bond estimators for a balanced panel data of 52 provinces during the period 2005–2014. More interestingly are the empirical findings. First, both FDI and institutional environment significantly boost private investment. Second, the FDI–private investment relationship completely varies based on the quality of institutional environment. Third, the positive effects of government revenue and government investment remain under different institutional environments. These findings suggest some important implications for governments in developing countries, especially the Vietnam government.

## KEYWORDS

FDI, GMM estimators, institutional environment, private investment, Vietnam

## JEL CLASSIFICATION

E22; F21; F23; O16

## 1 | INTRODUCTION

Foreign direct investment (FDI) is the fixed form of across-border business operations made mostly by the multi-national corporations in which FDI enterprises get benefits from popularizing their brand name, marketing and selling their products in other countries (Agosin & Machado, 2005) while private investment capital plays a key role in boosting economic growth, creating employment and thus stabilizing the social security (Khan & Reinhart, 1990). FDI has certain effects on private investment, although its significant contribution to economic development in host countries. On the one side, if foreign enterprises use domestic credit in host countries to

finance their business operations, then it puts high pressure on domestic interest rates, which leads to domestic enterprises to give up business opportunities. This is a crowding-out effect of FDI on domestic investment (Delgado & McCloud, 2017). On the other side, private investment can be supported by FDI inflows via cooperation opportunities in production such as an investment joint-venture between foreign and domestic enterprises; or domestic enterprises can supply raw materials/do outwork for FDI enterprises and receive transfer of modern technologies from FDI investors to cut production costs, and so on This is a crowding-in effect of FDI inflow on domestic investment (Agosin & Machado, 2005). Therefore, the recent related literature has noted that FDI

inflows can crowd out/in private investment in host countries. So, what can lead to the crowding-in/out relationship between FDI inflows and domestic private investment? It should be the institutional environment. A theoretical framework developed by Morrissey and Udomkerdmongkol (2012) indicates that the effect of FDI inflows on private investment has basically influenced by the institutional environment in host countries. They arguably emphasize that if a capital-unfriendly regime (poor institutional environment) dominates, then capital source for the development of private sector will not be encouraged. In that case, domestic enterprises will seek a foreign partner and attract FDI inflows. Hence, FDI will be a relatively important capital source to substitute domestic private investment. On the contrary, we argue that under good institutional environment, the governments make efforts to support the development of private sector to promote economic activities, create more jobs and improve economic growth, which lead to stabilization of the social security. The governments try to attract FDI inflows into industries/sectors which the private sector cannot do well, due to a large investment capital or lack of management technology. So, FDI inflows will become a necessary capital to supplement domestic private investment.

As a fast-growing economy, Vietnam has attracted a large amount of FDI since the period of *Doi Moi* in 1986. In 2015, Vietnam attracted US\$ 24.1 billion. Up to September 2016, the country has got 1820 newly licensed projects with a total registered capital of 11.165 billion USD (a 1.1% year-on-year increase) and 851 active projects to increase capital with total additional capital of 5.265 billion USD. Does this enormous amount of FDI in Vietnam substitute or complement private investment? Does the difference in institutional environment result in the difference in the FDI–private investment relationship in Vietnam? The primary objective of this article is to address these research questions.

Due to the increase in the inward FDI inflows into Vietnam that can crowd out or in private investment, we highlight the importance of taking institutional quality into account for understanding of the FDI–private investment relationship. Most of the related literature on institutions has either studied the relationship between institutions and private investment (Aysan, Nabli, & Véganzonès-varoudakis, 2007; Feng, 2001; Munemo, 2012) or the relationship between institutions and FDI (Buchanan, Le, & Rishi, 2012; Fukumi & Nishijima, 2010; Kuzmina, Volchkova, & Zueva, 2014). Although a few papers study the effects of FDI, institutions and their interaction terms on private investment (Farla, de Crombrughe, & Verspagen, 2014; Morrissey & Udomkerdmongkol, 2012), so far no existing papers provide empirical evidence to

show that the relationship between FDI and private investment will vary based on the institutional quality. To examine the role of institutional quality in the FDI–private investment relationship, we first use the two-step system Arellano–Bond estimator (S-GMM) to estimate the effects of FDI and institutional quality on private investment. Then, we investigate the effects of FDI on private investment under different institutional environments (good and poor institutional environment). In particular, the robustness of the estimation will be checked by the two-step difference Arellano–Bond estimator (D-GMM).

Given the relevance of this topic, the most important recent contributions to the literature are Morrissey and Udomkerdmongkol (2012) and Farla et al. (2014) which both use S-GMM to examine the effects of FDI, institutions and their interaction terms on private investment for a panel data of 46 developing countries with control variables of public investment and economic growth. They have the same conclusion that FDI crowds out private investment. In particular, Morrissey and Udomkerdmongkol (2012) and Farla et al. (2014) introduced the governance indicators into their research via interaction terms between the governance indicators and FDI, but they did not examine whether the FDI–private investment nexus varies on the quality of these governance indicators. In addition, the bias in their estimates was further exacerbated by the problem of instrument proliferation in their S-GMM specification although it can be solved by applying the rule of thumb suggested by Roodman (2009). In comparison with these works, this paper provides two highlight aspects. First, the sample is a group of provinces of an individual country whose homogeneous characteristic is better than that of a group of countries. The advantage in a subnational analysis is that the aspects of custom, culture and language and political and legal foundation are more similar within the boundaries of an individual nation than they are across all nations in the world (Malesky, McCulloch, & Nhat, 2015). Second, this study provides empirical evidence to confirm that the FDI–private investment relationship completely varies based on the quality of institutional environment.

In line with Morrissey and Udomkerdmongkol (2012) and Farla et al. (2014), Titarenko (2006), Mutenyo, Asmah, and Kalio (2010), Wang (2010), Eregha (2012) and Szkorupová (2015) find FDI crowds out domestic investment. In particular, Wang (2010) reports that the inward FDI reduces domestic investment whilst the cumulative FDI over time seems to promote it using the estimation methods of fixed-effects, random-effects and GMM Arellano–Bond estimator. Meanwhile, some investigations support the “crowd-in hypothesis” (Al-Sadig, 2013; Ang, 2009; Ang, 2010; Desai, Foley, & Hines Jr,

2005; Ndikumana & Verick, 2008; Tang, Selvanathan, & Selvanathan, 2008). Al-Sadig (2013) concludes FDI stimulates private investment using S-GMM for an unbalanced panel data of 91 developing countries during the period 1970–2000. The findings in Al-Sadig (2013) show that the positive impacts of FDI in the group of low-income countries depend upon the availability of human capital in the host country. Conversely, some researchers confirm mixed evidence for this FDI–domestic investment relationship (Agosin & Machado, 2005; Ahmed, Ghani, Mohamad, & Derus, 2015; Apergis, Katrakilidis, & Tabakis, 2006; Mišun & Tomšák, 2002; Onaran, Stockhammer, & Zwickl, 2013). Recently, Chen, Yao, and Malizard (2016) show a neutral relationship between FDI and private investment in China from 1994Q1 to 2014Q4 using the autoregressive distributed lag bounds test. By referring to the role of the entry mode decided by FDI investors, they find equity joint venture crowds in private investment, whilst wholly foreign-funded enterprise crowds it out.

The structure of the article is organized in the following way. Section 2 takes a look into the overview of FDI inflows, private sector and institutional reforms in Vietnam, which briefly provides information about FDI inflows into Vietnam during the period 1988–2015, about the development of private sector during 1988–2015, and about the process of institutional reforms in Vietnam from 1986. The model specification and data are presented in Section 3 that especially emphasizes the characteristics and appropriateness of the two-step GMM Arellano–Bond estimators. Section 4 is the empirical results that consist of S-GMM estimates and the robustness check by D-GMM. The final section concludes and suggests some important policy implications based on the findings in Section 4.

## **2 | OVERVIEW OF FDI INFLOWS, PRIVATE SECTOR AND INSTITUTIONAL REFORMS IN VIETNAM**

### **2.1 | FDI inflows in Vietnam: 1988–2015**

According to IMF (2016), Vietnam's export growth in manufacturing is largely contributed by major FDI investors from Asian countries (Korea, Japan, Singapore and Taiwan). FDI inflows rapidly increased after Vietnam's WTO accession in January 2007 from an annual average of US\$ 2.5 billion during 2000–2005 to US\$ 8.4 billion during 2008–2014. The share of FDI sector in Vietnam's total exports has reached 70%. FDI keep rising in 2015, mainly to the export-orientated manufacturing sector.

Since Law on Foreign Direct Investment was issued in 1988, FDI has crucially contributed to Vietnam's economic development. By the end of 2015, the total amount of registered FDI (accumulation) reached US\$ 313.5 billion while the total amount of disbursed FDI reached US\$ 138.692 billion (Ngo, 2016). The total amount of registered FDI inflow from 1988 to 2015 is given in Table 1.

Investors from 101 countries and territories have been invested in Vietnam. The majority of FDI into Vietnam comes from Asian countries. South Korea is the biggest foreign investor with 4.892 projects and US\$ 44.4 billion of registered capital, followed by Japan, Singapore, Taiwan and British Virgin Islands. These top five investors have invested in 609.824 projects (47.5% of the total licensed projects) with total committed capital of US\$ 166.8 billion (42.8% of the total committed capital). The following next big five investors are Hong Kong, Malaysia, United States, China and Thailand. The “top 10” economies account over 68% of the total licensed projects and committed capital in Vietnam (Table 2).

South-Eastern Vietnam is the most leading among six regions attracting the most FDI capital with 10.631 licensed projects and US\$ 112.05 billion registered capital, accounting for 42% total amount of registered FDI. Following is Red River Delta with 5.978 licensed projects and US\$ 65.78 billion registered capital, corresponding to 25.1%. The third one is North Central and Central Coastal region with 1.185 licensed projects and US\$ 51.83 billion registered capital, accounting for 19.7%. Central Highlands is the lowest FDI attractors with 156 licensed projects and US\$ 0.859 billion registered capital, accounting for 0.32% (Table 3).

In terms of economic structure, foreign investors have focused mainly on manufacturing and processing with 10.555 projects and US\$ 156.7 billion, accounting for 56.89% of total amount of FDI. Real-estate business shares 18.3% of total amount of FDI with US\$ 50.6 billion. Next is agriculture, fishing and forestry account for 546 projects with total capital of US\$ 3.9 billion, corresponding to 1.4% of total amount of FDI. Although this industry is strongly encouraged, it has attracted very few projects. The scale of projects is small, mainly used in livestock production, poultry feed production and processing of poultry products for domestic consumption and export.

### **2.2 | Development of private sector: 1985–2015**

In 1985, according to the General Statistics Office (GSO), industrial production units of private sector employed 23.2% of the total labour and produced 15.3% of total industrial output in Vietnam.

**TABLE 1** The total amount of registered FDI inflow during 1988–2015

Year	No. projects	Capital (US\$ million)	Year	No. projects	Capital (US\$ million)
1988	37	371.8	2002	808	2,998.8
1989	68	582.5	2003	791	3,191.2
1990	108	839	2004	811	4,547.6
1991	151	1,322.3	2005	970	6,838.8
1992	197	2,165	2006	987	12,004.5
1993	269	2,900	2007	1,544	21,347.8
1994	343	3,765.6	2008	1,557	71,726.8
1995	370	6,530.8	2009	1,208	23,107.3
1996	325	8,497.3	2010	1,240	19,886.8
1997	345	4,649.1	2011	1,091	15,618.7
1998	275	3,897	2012	1,287	16,348.0
1999	311	1,568	2013	1,530	22,352.2
2000	371	2,012.4	2014	1,843	20,230.0
2001	555	3,142.8	2015	2,120	22,757.0

<sup>a</sup>Source: Government Statistics Office (GSO) and Foreign Investment Agency (FIA).

**TABLE 2** Top 10 FDI countries and territories during 1988–2015

Countries and territories	Number of projects	Capital (US\$ billion)
South Korea	4.892	44.45
Japan	2.830	39.17
Singapore	1.497	34.16
Taiwan	2.497	29.86
British Virgin Islands	603	19.20
Hong Kong	972	16.79
Malaysia	516	13.28
United States	779	11.21
China	1.271	8.71

<sup>a</sup>Source: Government Statistics Office (GSO) and Foreign Investment Agency (FIA).

In 1986, the *Doi Moi* policy (the Reform in Vietnam) was launched at the 6th Party Congress. The *Doi Moi* policy officially recognized the private sector as an important part of the development process of socialist-oriented market economy and of a multi-sector economy. In 1989, there were 333,300 household businesses that were registered across the country (Binh, 2018).

In 1987, by the participation of foreign investment sector businesses when the first Law on Foreign Investment was adopted, the private sector in Vietnam was expanded. In 1990, with the introduction of the Company Law and the Sole Proprietorship Law, private sector companies and enterprises were officially recognized for the

**TABLE 3** FDI in regions during 1988–2015

Regions	Number of projects	Capital (US\$ billion)
South-eastern region	10.631	112.05
Red River Delta	5.978	65.78
North Central & Central Coastal region	1.185	51.83
Mekong River Delta	151	15.72
Midlands & North mountain	622	12.93
Central Highlands	156	0.859

<sup>a</sup>Source: Government Statistics Office (GSO) and Foreign Investment Agency (FIA).

first time. The share of domestic private investment in GDP was approximately 10.2% and 14.6%, respectively, for the period of 1990–1995 and the period of 1996–1999.

In 1999, the issue of the Enterprise Law triggered a boom in the development of the formal domestic private sector companies. After the law was launched, the number of annually registered companies increased dramatically. Vietnamese business people have been invested billions of US dollars into the economy through companies registered under the Enterprise Law (Binh, 2018). During the period of 2000–2003, the investment of private sector in the share of GDP was approximately 17.3%.

In 2004, the Enterprise Law and the Investment Law were revised by combining the different laws applicable to domestic, foreign and state-owned investors and

companies. A common legal framework applicable to all investors, regardless of their ownership, became a reality in 2005. At this time, the private investment contributes 19.2% GDP. After this period, private sector investment rapidly increased from an annual average of 20% GDP during 2006–2008 to 22% GDP during 2009–2015.

### 2.3 | Process of institutional reforms in Vietnam: 1986 onwards

Since constructing the market economy institution, Vietnam has amended the Constitution many times to guide the development of the socio-economy (Thuy, 2019).

The period from 1986 to 1991: The year 1986 was the turning-point when Vietnam began for reforming with three pillars: (a) Transition to a market economy; (b) building a multi-sector commodity economy; (c) International and regional economic integration. Law on Foreign Investment (1987), Land Law (1987), Import and Export Tax Law (1989) and Company Law and Sole Proprietorship Law (1990) were launched, which marked the process of opening the economy, eliminated state-monopoly on foreign trade and allowed private enterprises to participate in foreign trade.

The period from 1992 to 2000: The revised Constitution in 1992 provided an important legal basis for creating equality among economic sectors. Then, a series of important laws of the market economy, such as Land Law, Bankruptcy Law and so on were issued. In this period, laws in the field of economics have rapidly developed with the introduction of laws on investment, business, budget, tax, bank, land, commerce and so on to effectively facilitate the activities of economic sectors.

The period from 2001 to 2012: The promulgation of the Law on State-owned Enterprises (2003), Competition Law (2004), Civil Code (2005), Commercial Law (2005), Investment Law (2005), Intellectual Property Law (2005), and so on were considered a breakthrough in thinking and reforming the legal system in Vietnam. In particular, in 2004, Vietnam Competition Authority and Vietnam Competition Council were established to meet the needs of law adjustment. These indicated the determination of the Government in the process of reforming and improving the institutional environment to ensure a good business environment for entities in a market economy (Thuy, 2019).

The period from 2012 onward: The revised Constitution in 2013 and a series of revised laws in 2014 such as Enterprise Law, Investment Law, Housing Law demonstrated Vietnam's efforts to create a more open and transparent investment environment for businesses and investors, contributing to the development of enterprises.

## 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:

$$PINV_{it} = \beta_0 + \beta_1 PINV_{it-1} + \beta_2 FDI_{it} + \beta_3 PCI_{it} + X_{it}\beta'_4 + \eta_i + \xi_{it} \quad (1)$$

where subscript  $i$  and  $t$  are the province and time index, respectively.  $PINV_{it}$  is domestic private investment,  $PINV_{it-1}$  is proxy for initial level of domestic private investment,  $FDI_{it}$  is the FDI and  $PCI_{it}$  is the provincial competitiveness index, proxy for institutional quality (Dang, 2013; Malesky et al., 2015; Malesky & Taussig, 2009; Nguyen & van Dijk, 2012; Tran, Grafton, & Kompas, 2008).  $X_{it}$  is a set of control variables (government revenue, government investment, government current expenditure, economic growth, labour force, trade openness, consumer price index and infrastructure);  $\eta_i$  is an unobserved time-invariant, province-specific effect and  $\xi_{it}$  is an observation-specific error term.

There are four serious problems of econometrics from estimating Equation (1). First, some variables such as FDI, economic growth, institutional quality may be endogenous. So, these variables can correlate with the error term  $\eta_i$ , which leads to the endogenous phenomenon. Second, some unobserved time-invariant, province-specific characteristics (fixed effects) like geography and anthropology can correlate with the independent variables. These fixed effects exist in the error term  $\eta_i$ . Third, the presence of the lagged dependent variable  $PINV_{it-1}$  results in a high autocorrelation. Finally, the panel data has a short observation length ( $T = 10$ ) and a large unit of provinces ( $N = 52$ ). These problems may cause OLS estimator inconsistent and biased. Fixed effects model and Random effects model cannot deal with endogenous phenomena and autocorrelation while PMG estimator (Pool Mean Group) and MG estimator (Mean Group) need a long observation length to estimate in both short-run and long-run. In addition, IV-2SLS estimator requires some suitable instrumental variables which are out of independent variables in the model. Therefore, we decide to select S-GMM as suggested by Judson and Owen (1999).

For Equation (1), we use the general method of moments (GMM) Arellano and Bond (1991) estimators first proposed by Holtz-Eakin, Newey, and Rosen (1988). Equation (1) is a dynamic model, so we take the first difference to remove province-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 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:

$$\begin{aligned} PINV_{it} - PINV_{it-1} = & \beta_1(PINV_{it-1} - PINV_{it-2}) \\ & + \beta_2(FDI_{it} - FDI_{it-1}) + \beta_3(PCI_{it} - PCI_{it-1}) \\ & + (X_{it} - X_{it-1})\beta_4' + (\xi_{it} - \xi_{it-1}) \end{aligned} \quad (2)$$

In case variables are persistent, their past values show little information about their future changes, making their lags become weak instruments for their differenced series. Thus, Arellano and Bover (1995) suggests 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 S-GMM, a strategy which is able to enhance the efficiency via its reduction in biases and solving the weak instruments problem in D-GMM (Blundell & Bond, 1998). The consistency of S-GMM is obviously based on the assumptions that the error terms are uncorrelated, the instruments are valid and the changes in additional instruments are not correlated with province-fixed effects.

In comparison with the one-step GMM estimators, the two-step GMM estimators are more asymptotically efficient. However, the application of the two-step GMM estimators in small samples, as in our study, has some problems (Roodman, 2009). 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 provinces. To avoid it, the rule of thumb should be applied to maintain the number of instruments less than or equal to the number of panel units (Roodman, 2009).

The validity of instruments in S-GMM and D-GMM is assessed through Sargan statistic, Hansen statistic and Arellano–Bond statistic. The Sargan and Hansen tests with null hypothesis  $H_0$ : The instrument is strictly exogenous, which means that it does not correlate with errors. Thus, the p-value of Sargan statistic and Hansen statistic is as big as possible. 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).

To examine the FDI–private investment relationship under different institutional environment (good/poor), we determine a boundary value of institutional quality ( $\gamma$ ) and follow the empirical equations:

$$\begin{aligned} PINV_{it} = & \theta_{10} + \theta_{11}PINV_{it-1} + \theta_{12}FDI_{it} + X_{it}\theta_{13}' \\ & + \eta_i + \xi_{it}, \text{ if } PCI_{it} \geq \gamma \end{aligned} \quad (3)$$

$$\begin{aligned} PINV_{it} = & \theta_{20} + \theta_{21}PINV_{it-1} + \theta_{22}FDI_{it} + X_{it}\theta_{23}' \\ & + \eta_i + \xi_{it}, \text{ if } PCI_{it} < \gamma \end{aligned} \quad (4)$$

In Equations (3) and (4)  $\gamma$  is the bound value of PCI (threshold value). The PCI index is constructed in a three-step sequence, referred to as “the 3 Cs” (VCCI and USAID, 2015): (a) collect business survey data and published data sources, (b) calculate 10 sub-indices and standardize to a 10-point scale and (c) calibrate the composite PCI as the weighted mean of 10 sub-indices with a maximum score of 100 points. Based on the composite PCI points, the institutional quality is categorized into five kinds: Excellence ( $PCI \geq 62$  points), high (60–62), mid-high (57–62), mid-low (56–57), low (53.5–56) and very low ( $PCI < 53.5$ ). In this article excellence, high and mid-high are coded into good institutions ( $PCI \geq 57$ ) while mid-low, low and very low are coded into poor institutions ( $PCI < 57$ ). Thus, the boundary value of PCI is  $\gamma = 57$  points. This boundary value divides whole observations of the research sample into the group of good institutional environment with PCI greater than or equal 57 points and the group of poor one with PCI less than 57 points.

### 3.2 | Data

Cross-sections and time series are extracted to accommodate the balanced panel data of 52 provinces<sup>1</sup> over the period of 2005–2014 from General Statistics Office of Vietnam (GSO). There are 11 out of 63 provinces to be eliminated due to data not available. The description of variables is given in Table 4 and the statistical description of variables is presented in Table 5.

The matrix of correlation coefficients for variables is presented in Table 6. Government revenue, government investment, government current expenditure are positively linked whilst economic growth is significantly negative connected with private investment. All correlation coefficients between explanation variables are lower than 0.8, which helps to eliminate the possibility of collinearity between these variables.

**TABLE 4** Description of variables used in the analysis

Variable	Description
PINV	Domestic private investment capital in a province (per cent of GDP)
FDI	Foreign direct investment accumulation capital yearly for each province (in log)
PCI	Provincial competitiveness index is obtained from the Vietnam Provincial Competitiveness Index survey, which are jointly carried out by United States Agency for International Development (USAID) and the Vietnam Chamber of Commerce and Industry (VCCI) for the Vietnam Competitiveness Initiative, to assess and rank provincial governments by their regulatory environments for private sector development (VCCI and USAID, 2015)
GREV	Government revenue in a province (per cent of GDP)
GINV	Public investment capital in a province (per cent of GDP)
GEXP	Government current expenditure in a province (per cent of GDP)
GDP	Real per capita gross domestic product of a province (in log)
LABO	A ratio between working age people (15–64) and total population (per cent)
OPEN	Ratio between sum of exports-imports and province GDP (per cent of GDP)
CPI	Consumer price index, proxy for inflation of a province (in log)
TELE	Infrastructure, a number of telephone lines per 100 people (in log)

<sup>a</sup>Source: General Statistics Office of Vietnam (GSO).

**TABLE 5** Statistical description of variables

Variable	Observed	Mean	SD	Min	Max
Private investment (PINV, per cent)	520	23.111	9.586	0.731	72.83
Foreign direct investment (FDI, log)	520	618.03	234.09	−299.57	1,113.4
Provincial competitiveness index (PCI)	520	57.236	6.287	37.96	77.2
Government revenue (GREV, percent)	520	27.613	14.823	5.576	98.27
Government investment (GINV, per cent)	520	6.446	4.488	0.831	27.274
Gov. current expenditure (GEXP, per cent)	520	12.379	6.983	1.021	51.583
GDP per capita (GDP, log)	520	299.420	56.177	198.268	569.94
Labour force (LABO, per cent)	520	55.765	4.890	36.621	67.396
Trade openness (OPEN, per cent)	520	87.820	117.983	1.052	894.16
Consumer price index (CPI, log)	520	470.306	5.565	459.69	494.16
Infrastructure (TELE, log)	520	623.200	130.73	338.77	1,135.2

<sup>a</sup>Source: Processing by Stata software.

## 4 | EMPIRICAL RESULTS

### 4.1 | S-GMM estimates

The estimated results derived from S-GMM are given in Table 7. Column 1 and Column 2 are, respectively, the reduced models without one/two variable(s) while Column 3 is the full model. To check the reliability of the sign and significance of estimated coefficients, some variables are removed out of the model. The results show sign, size and significance of estimated coefficients, especially the coefficients of FDI, institutional quality and interaction term in Table 7 are nearly unchanged. In particular, the positive signs in coefficients of FDI and institutional quality are opposite to the negative signs of correlation coefficients of (FDI, private investment) and (PCI, private investment) given in Table 6. It implies there is an endogenous phenomenon between the regressand and regressors. Therefore, S-GMM with instrumental variables seems to be appropriate for this empirical model.

In the estimation procedure, we detect FDI is endogenous, so we use the lags of FDI as instrumented and the remaining variables (private investment, PCI, government revenue, government investment, government current expenditure, economic growth, labour force, inflation and infrastructure) as instruments. In order to assess the validity of these instruments and the serial auto-correlation of residuals, we perform the Sargan and Hansen tests (test of over-identifying restrictions with the null hypothesis “the instruments as a group are exogenous”) as well as the Arellano–Bond test for serial correlation AR(2), which is applied to the difference residuals to purge the unobserved and perfectly auto-correlated. In Table 7, the Hansen and Sargan tests for over-identifying

**TABLE 6** Matrix of correlation coefficients between variables

	PINV	FDI	PCI	GREV	GINV	GEXP	GDP	LABO	OPEN	CPI	TELE
PINV	1.00										
FDI	-0.05	1.00									
PCI	-0.032	0.36***	1.00								
GREV	0.15***	0.024	0.057	1.00							
GINV	0.20***	-0.1***	-0.025	0.39***	1.00						
GEXP	0.15***	-0.3***	-0.3***	0.27***	0.54***	1.00					
GDP	-0.25***	0.60***	0.38***	-0.08*	-0.34***	-0.58***	1.00				
LABO	0.11***	0.13***	0.009	-0.07	-0.16***	0.26***	-0.09**	1.00			
OPEN	-0.053	0.49***	0.30***	0.033	-0.17***	-0.34***	0.41***	0.091**	1.00		
CPI	0.047	-0.052	-0.1**	0.035	0.08*	0.037	-0.1***	-0.040	-0.025	1.00	
TELE	0.022	0.51***	0.28***	0.061	-0.21***	-0.28***	0.54***	0.13***	0.24***	0.011	1.00

Note: \*\*\*, \*\* and \* denote significance at 1, 5 and 10%, respectively.<sup>a</sup>Source: Processing by Stata software.

**TABLE 7** FDI, institutional quality and private investment: S-GMM, 2005–2014 (Dependent variable: Private investment)

	(1)	(2)	(3)
Private investment (-1)	0.612*** (0.051)	0.613*** (0.051)	0.616*** (0.052)
FDI	0.067** (0.027)	0.068** (0.027)	0.059** (0.027)
Institutional quality	0.896*** (0.330)	0.900*** (0.333)	0.797** (0.326)
Government revenue	0.062** (0.028)	0.061** (0.029)	0.061** (0.029)
Government investment	0.163** (0.077)	0.161** (0.078)	0.165** (0.082)
Government current expenditure	-0.065 (0.067)	-0.065 (0.068)	-0.062 (0.065)
Economic growth	-0.029 (0.018)	-0.030 (0.021)	-0.027 (0.019)
Labour force	-0.040 (0.077)	-0.043 (0.080)	-0.028 (0.083)
Inflation	-0.068** (0.028)	-0.069** (0.028)	-0.060** (0.028)
Infrastructure		0.0008 (0.006)	0.0004 (0.006)
Trade openness			-0.002 (0.003)
Instrument	25	25	25
Province/Observation	52/364	52/364	52/364
Sargan test	0.195	0.149	0.173
Hansen test	0.465	0.392	0.316
AR(2) test	0.833	0.834	0.808

Note: \*\*\*, \*\* and \* denote significance at 1, 5 and 10%, respectively.<sup>a</sup>Source: Processing by Stata software.

restrictions indicate that the instrument set turns out valid. The Arellano–Bond AR(2) tests accept the hypothesis of no autocorrelation of the second order. These results support our model specification.

Table 7 presents the empirical results. Contrary to Morrissey and Udomkermongkol (2012) and Farla et al. (2014), we find FDI stimulates private investment, supporting “crowd-in hypothesis” in the prior findings (Al-Sadig, 2013; Ang, 2009; Ang, 2010; Desai et al., 2005; Ndikumana & Verick, 2008; Tang et al., 2008). This

finding shows the relatively important role of FDI inflows in Vietnam’s economic development process since the period of *Doi Moi* in 1986. The spillover effects of FDI inflows to Vietnam significantly contribute to increasing investment from private sector. Meanwhile, in line with Morrissey and Udomkermongkol (2012) and Farla et al. (2014), the coefficient of institutional quality (PCI) is positive. Since the period of transition economy, Vietnam government always reforms and improves the institutional environment to support the economic activities of



**TABLE 8** FDI and private investment under institutional environment: S-GMM, 2005–2014 (Dependent variable: Private investment)

	Good institutional environment	Poor institutional environment
Private investment (–1)	0.649*** (0.049)	0.325*** (0.049)
FDI	0.005** (0.002)	–0.005** (0.002)
Government revenue	0.060** (0.028)	0.055* (0.029)
Government investment	0.262** (0.124)	0.445*** (0.071)
Government current expenditure	–0.180 (0.109)	0.041 (0.070)
Economic growth	–0.019 (0.014)	0.024 (0.014)
Labour force	0.073 (0.086)	–0.093 (0.115)
Inflation	0.018 (0.012)	0.014 (0.009)
Infrastructure	–0.004 (0.005)	0.008** (0.003)
Trade openness	0.008*** (0.002)	0.0001 (0.006)
Instrument	25	27
Province/Observation	48/253	41/163
Sargan test	0.546	0.107
Hansen test	0.378	0.396
AR(2) test	0.408	0.656

Note: \*\*\*, \*\* and \* denote significance at 1, 5 and 10%, respectively.<sup>a</sup>Source: Processing by Stata software.

**TABLE 9** FDI, institutional quality and private investment: D-GMM, 2005–2014 (Dependent variable: Private investment)

	(1)	(2)	(3)
Private investment (–1)	0.103** (0.050)	0.115** (0.050)	0.105* (0.056)
FDI	0.130*** (0.048)	0.111* (0.056)	0.120** (0.059)
Institutional quality	1.414** (0.534)	1.282** (0.57)	1.341** (0.598)
Government revenue	0.160** (0.068)	0.150** (0.065)	0.152** (0.066)
Government investment	0.656** (0.264)	0.556** (0.253)	0.584** (0.258)
Government current expenditure	–0.914 (0.572)	–0.874 (0.520)	–0.930 (0.541)
Economic growth	0.033 (0.073)	0.040 (0.061)	0.044 (0.062)
Labour force	–1.111 (0.715)	–1.042 (.653)	–1.118 (0.677)
Inflation	–0.0307 (0.065)	–0.032 (0.060)	–0.038 (0.062)
Infrastructure		0.004 (0.007)	0.003 (0.007)
Trade openness			–0.005 (0.012)
Instrument	19	19	20
Province/Observation	52/364	52/364	52/364
Sargan test	0.966	0.976	0.954
Hansen test	0.931	0.874	0.827
AR(2) test	0.646	0.664	0.657

Note: \*\*\*, \*\* and \* denote significance at 1, 5 and 10%, respectively.<sup>a</sup>Source: Processing by Stata software.

private sector. Consequently, private sector's investment is increasing.

The empirical results also show government revenue and government investment foster private investment while inflation is detrimental to it. The positive impact of government investment confirms the prior findings

(Andrade & Duarte, 2016; Erden & Holcombe, 2006; Murty & Soumya, 2007; Ramirez, 2000) that government investment crowds in private investment. The negative impact of inflation is similar to the finding in Al-Sadig (2013) that macroeconomic instability (proxy by inflation) reduces private investment.

Table 8 indicates the FDI–private investment relationship under different institutional environments. FDI crowds in private investment under good institutional environment while it crowds out under poor one. Under a good institutional environment, the design and implementation of policies of local authorities to attract FDI inflows is good. They actively seek for high quality FDI inflows into sectors in which the private sector cannot do well. The private sector can have access to modern technologies of production and management and cooperate with FDI enterprises through economic activities like supply of raw materials and outsourcing of parts. Conversely, under a poor institutional environment, policies to attract FDI are not well-designed and well-implemented by local governments. In order to receive more FDI inflows for local economic development, local authorities participate in a race to the top to attract FDI projects, which leads to an oversupply of tax incentives and infrastructure for foreign investors. They are willing to accept low-quality FDI inflows into sectors in which the private sector can do better. As a result, the private sector restricts production and investment. Meanwhile, the effects of government revenue and government investment are completely similar to those in Table 7.

## 4.2 | Robustness check

To check the robustness of the estimation, we re-estimate Equation (1) using D-GMM. Similar to the estimation procedure of S-GMM, FDI is also endogenous in D-GMM. The corresponding results are reported in Table 9. The core variables (private investment [−1], FDI, institutional quality, government revenue and government investment) remain highly significant. Consistent with our S-GMM estimates, we find both FDI and institutional quality boost private investment, but their interaction term reduces it. These findings are confirmed by battery of diagnostic tests shown at the bottom of Table 9 (Sargan, Hansen and Arellano–Bond AR(2) tests), indicating that our D-GMM estimates are largely reliable.

## 5 | CONCLUSION AND POLICY IMPLICATIONS

Motivated by the fact that different institutional environments can result in different FDI–private investment relationships, this article empirically investigates the importance of institutional environment in the relationship between FDI and private investment in Vietnam. Using the two-step GMM Arellano–Bond estimators for a balanced panel data of 52 provinces over the period

2005–2014, we estimate the effects of FDI, institutional quality and their interaction term on private investment. Then, we test the FDI–private investment relationship under different institutional environments. Hence, the contribution of the paper is examining whether the FDI–private investment relationship depends on the quality of institutional environment.

Consistent with the previous literature, our study indicates that both FDI and institutional quality promote private investment, but their interaction term reduces it. In particular, the empirical results confirm the dependence of the FDI–private investment relationship on the quality of institutional environment. There is a strong correlation of the crowding in and crowding out with the good institutional environment and the poor one, respectively. From these findings, we emphasize that any research on the FDI–private investment relationship in Vietnam without taking the role of institutional environment into account is likely to be a shortcoming. In addition, inflation, which is proxy for macroeconomic instability, decreases private investment. More interestingly are the findings that the significantly positive effects of government revenue and government investment still remain under different kinds of institutional environment.

The findings provide a case for more prudence in design, formulation and implementation of policies relating to FDI attraction in developing countries. The implication is that the institutional environment plays a crucial role in the FDI–private investment relationship, and moreover, the good one not only promotes private investment but sets up a helpful effect on this dynamic relationship as well. Therefore, governments in developing countries, especially the Vietnam government, should strongly implement institutional reforms to provide a conducive environment for attracting more FDI inflows and promoting private investment. For future research, it will be useful to look at the effect of different FDI inflows by sector/industry on private investment under different institutional environments.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### ENDNOTE

<sup>1</sup> Ha Noi, Vinh Phuc, Bac Ninh, Quang Ninh, Hai Duong, Hai Phong, Hung Yen, Thai Binh, Ha Nam, Nam Dinh, Ninh Binh, Cao Bang, Lao Cai, Yen Bai, Thai Nguyen, Lang Son, Bac Giang, Phu Tho, Son La, Hoa Binh, Thanh Hoa, Nghe An, Ha Tinh, Quang Tri, Thua Thien-Hue, Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan, Dak

Nong, Lam Dong, Binh Phuoc, Tay Ninh, Binh Duong, Dong Nai, Ba Ria-Vung Tau, Ho Chi Minh City, Long An, Tien Giang, Ben Tre, Tra Vinh, Vinh Long, An Giang, Kien Giang, Can Tho, Hau Giang, Bac Lieu and Ca Mau.

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## REFERENCES

- Agosin, M., & Machado, R. (2005). Foreign investment in developing countries: Does it crowd in domestic investment? *Oxford Development Studies*, 33(2), 149–162.
- Ahmed, K. T., Ghani, G. M., Mohamad, N., & Derus, A. M. (2015). Does inward FDI crowd-out domestic investment? Evidence from Uganda. *Procedia-Social and Behavioral Sciences*, 172, 419–426.
- Al-Sadig, A. (2013). The effects of foreign direct investment on private domestic investment: Evidence from developing countries. *Empirical Economics*, 44(4), 1267–1275.
- 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.
- 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.
- Ang, J. B. (2010). Determinants of private investment in Malaysia: What causes the postcrisis slumps. *Contemporary Economic Policy*, 28(3), 378–391.
- Apergis, N., Katrakilidis, C. P., & Tabakis, N. M. (2006). Dynamic linkages between FDI inflows and domestic investment: A panel cointegration approach. *Atlantic Economic Journal*, 34(4), 385–394.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29–51.
- Aysan, A. F., Nabli, M. K., & Véganzonès-varoudakis, M. A. (2007). Governance institutions and private investment: An application to the Middle East and North Africa. *The Developing Economics*, 45(3), 339–377.
- Binh, L. D. (2018). Vietnam Private Sector: Productivity and Prosperity. *Economica*. Retrieved from <http://economica.vn/news/detail/vietnam-private-sector-kinh-te-tu-nhan-viet-nam/466>.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143.
- Buchanan, B. G., Le, Q. V., & Rishi, M. (2012). Foreign direct investment and institutional quality: Some empirical evidence. *International Review of Financial Analysis*, 21, 81–89.
- Chen, G. S., Yao, Y., & Malizard, J. (2016). Does foreign direct investment crowd in or crowd out private domestic investment in China? The effect of entry mode. *Economic Modelling*, 61, 409–419. <https://doi.org/10.1016/j.econmod.2016.11.005>
- Dang, D. A. (2013). How foreign direct investment promote institutional quality: Evidence from Vietnam. *Journal of Comparative Economics*, 41(4), 1054–1072.
- Delgado, M. S., & McCloud, N. (2017). Foreign direct investment and the domestic capital stock: The good–bad role of higher institutional quality. *Empirical Economics*, 53(4), 1587–1637.
- Desai, M. A., Foley, C. F., & Hines, J. R., Jr. (2005). Foreign direct investment and the domestic capital stock. *American Economic Review*, 95(2), 33–38.
- Erden, L., & Holcombe, R. G. (2006). The linkage between public and private investment: A co-integration analysis of a panel of developing countries. *Eastern Economic Journal*, 32(3), 479–492.
- Eregba, P. B. (2012). The dynamic linkages between foreign direct investment and domestic investment in ECOWAS countries: A panel cointegration analysis. *African Development Review*, 24(3), 208–220.
- Farla, K., de Crombrughe, D., & Verspagen, B. (2014). Institutions, foreign direct investment, and domestic investment: Crowding out or crowding in? *World Development*, 88, 1–9.
- Feng, Y. (2001). Political freedom, political instability, and policy uncertainty: A study of political institutions and private investment in developing countries. *International Studies Quarterly*, 45(2), 271–294.
- Fukumi, A., & Nishijima, S. (2010). Institutional quality and foreign direct investment in Latin America and the Caribbean. *Applied Economics*, 42(14), 1857–1864.
- Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica*, 56(6), 1371–1395.
- IMF (2016). IMF Executive Board Concludes 2016 Article IV Consultation with Vietnam. IMF Country Report No. 16/240.
- Judson, R. A., & Owen, A. L. (1999). Estimating dynamic panel data models: A guide for macroeconomists. *Economics Letters*, 65(1), 9–15.
- Khan, M. S., & Reinhart, C. M. (1990). Private investment and economic growth in developing countries. *World Development*, 18(1), 19–27.
- Kuzmina, O., Volchkova, N., & Zueva, T. (2014). Foreign direct investment and governance quality in Russia. *Journal of Comparative Economics*, 42(4), 874–891.
- Malesky, E., McCulloch, N., & Nhat, N. D. (2015). The impact of governance and transparency on firm investment in Vietnam. *The Economics of Transition*, 23(4), 677–715.
- Malesky, E., & Taussig, M. (2009). Out of the gray: The impact of provincial institutions on business formalization in Vietnam. *Journal of East Asian Studies*, 9(2), 249–290.
- Mišun, J., & Tomšk, V. (2002). Does foreign direct investment crowd in or crowd out domestic investment? *Eastern European Economics*, 40(2), 38–56.
- Morrissey, O., & Udomkerdmongkol, M. (2012). Governance, private investment and foreign direct investment in developing countries. *World Development*, 40(3), 437–445.
- Munemo, J. (2012). Business regulations and private domestic investment in Africa. *Journal of African Business*, 13(2), 157–164.
- Murty, K. N., & Soumya, A. (2007). Effects of public investment on growth and poverty. *Economic and Political Weekly*, 42(1), 47–59.
- Mutenyo, J., Asmah, E., & Kalio, A. (2010). Does foreign direct investment crowd-out domestic private investment in Sub-Saharan Africa? *The African Finance Journal*, 12(1), 27–52.

- Ndikumana, L., & Verick, S. (2008). The linkages between FDI and domestic investment: Unravelling the developmental impact of foreign investment in Sub-Saharan Africa. *Development and Policy Review*, 26(6), 713–726.
- Ngo, Q. T. (2016). Retrieved from <http://www.ipd.org.vn/nghien-cuu-truong-hop-noi-bat/dau-tu-truc-tiep-nuoc-ngoai-o-viet-nam-giai-doan-1988-2015:-thuc-trang-va-van-de-tac-gia:-ngo-quang-trung-a452.html>.
- Nguyen, T. T., & van Dijk, M. A. (2012). Corruption, growth and governance: Private vs state owned firms in Vietnam. *Journal of Banking and Finance*, 36(11), 2935–2948.
- Onaran, Ö., Stockhammer, E., & Zwickl, K. (2013). FDI and domestic investment in Germany: Crowding in or out? *International Review of Applied Economics*, 27(4), 429–448.
- Ramirez, M. D. (2000). The impact of public investment on private investment spending in Latin America: 1980–95. *Atlantic Economic Journal*, 28(2), 210–225.
- Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, 9(1), 86–136.
- Szkorupová, Z. (2015). Relationship between Foreign direct investment and domestic investment in selected countries of central and Eastern Europe. *Procedia Economics and Finance*, 23, 1017–1022.
- Tang, S., Selvanathan, E. A., & Selvanathan, S. (2008). Foreign direct investment, domestic investment and economic growth in China: A time series analysis. *The World Economy*, 31(10), 1292–1309.
- Thuy, L. T. H. (2019). Institutional environment and the development of Vietnam enterprises. Retrieved from <http://tapchitaichinh.vn/nghien-cuu-trao-doi/moi-truong-the-che-voi-su-phat-trien-cua-doanh-nghiep-viet-nam-305719.html>.
- Titarenko, D. (2006). The influence of foreign direct investment on domestic investment processes in Latvia. *Transport and Telecommunication*, 7(1), 76–83.
- Tran, B. T., Grafton, Q. R., & Kompas, T. (2008). Institutions matter: The case of Vietnam. *The Journal of Socio-Economics*, 38(1), 1–12.
- VCCI and USAID (2015). Retrieved from <http://eng.pcvietnam.org/bang-xep-hang>.
- Wang, M. (2010). Foreign direct investment and domestic investment in the host country: Evidence from panel study. *Applied Economics*, 42(9), 3711–3721.

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