THE EFFECT OF FDI ON PRIVATE INVESTMENT IN THE SOUTHEAST REGION OF VIETNAM

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Abstract

The Southeast region of Vietnam is the most dynamic economic area of the country and contributes the most to state budget revenue. Every year, this area attracts a high volume of foreign direct investment (FDI) inflows with the establishment of more industrial zones, export processing zones, and high technology parks. Do FDI inflows into this area crowd out/in private investment? This study uses the general method of moments (GMM) Arellano-Bond estimator to empirically investigate the effect of FDI inflows on private investment in the Southeast region from 2005 to 2018. The FE-IV estimator is employed to check the robustness of the estimates. The results show that FDI inflows crowd private investment in this area. In addition, inflation increases private investment but infrastructure decreases it. The findings in this study provide some crucial policy implications for local governments in the Southeast region to attract more FDI inflows and stimulate more private investment.

Keywords: FDI; FE-IV estimator; GMM estimator; Private investment; Southeast region of Vietnam.

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TÁC ĐỘNG CỦA DÒNG VỐN FDI LỀN ĐẦU TƯ TƯ NHÂN Ở KHU VỰC ĐÔNG NAM BỘ CỦA VIỆT NAM

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Tóm tắt

Khu vực Đông Nam Bộ của Việt Nam là khu vực kinh tế năng động nhất và đóng góp phần lớn ngân sách thu được của nhà nước. Mỗi năm, khu vực này thu hút một lượng lớn dòng vốn đầu tư FDI với sự hình thành nhiều khu công nghiệp, khu chế xuất, và các công viên công nghệ cao. Liệu dòng vốn FDI đổ vào khu vực này khiến làm tăng/thúc đẩy đầu tư tư nhân? Bài viết này sử dụng phương pháp ước lượng GMM Arellano-Bond để đánh giá thực nghiệm tác động của dòng vốn FDI lên đầu tư tư nhân ở khu vực Đông Nam Bộ từ 2005 đến 2018. Phương pháp ước lượng FE-IV được sử dụng để kiểm tra tính bền của các ước lượng. Các kết quả cho thấy dòng vốn FDI thúc đẩy đầu tư tư nhân ở khu vực này. Ngoài ra, tỷ lệ làm tăng đầu tư tư nhân nhưng cơ sở hạ tầng làm giảm nó. Các phát hiện trong nghiên cứu này cung cấp một vài hàm ý chính sách quan trọng cho các chính quy định phương trong khu vực Đông Nam Bộ thu hút nhiều dòng vốn FDI hơn và thúc đẩy nhiều hơn đầu tư tư nhân.

Từ khóa: Đầu tư tư nhân; FDI; Khu vực Đông Nam Bộ của Việt Nam; Phương pháp ước lượng FE-IV; Phương pháp ước lượng GMM.

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1. INTRODUCTION

The foreign direct investment (FDI)–private investment relationship leads to opposing views among economists and policy-makers. Stemming from Agosin and Machado (2005), a new research strand on this topic has investigated this relationship in an attempt to examine substitutability or complementarity. FDI is a source of investment capital that greatly contributes to economic growth and development in countries worldwide. Agosin and Machado (2005) argue that FDI is a fixed kind of international business activity mostly set up by transnational enterprises in which foreign investors get benefits from popularizing their brand name, advertising, marketing, and selling their products and services in other countries, especially host countries. Khan and Reinhart (1990) find that private investment plays an outstanding role in promoting economic development and growth, creating employment, and thus improving social security.

FDI has both positive and negative effects on private investment despite its important role in the economic development of host countries. On one side, FDI inflows can encourage private investment through opportunities for cooperation. One example is an investment joint venture between domestic investors and foreign enterprises. In some cases, domestic investors may supply raw materials and do outwork for FDI enterprises and receive and learn advanced technologies from these enterprises to lower production costs. This is an example of the crowding-in impact of FDI on private investment (Agosin & Machado, 2005). On the other side, upward pressure on interest rates will occur in host countries if FDI enterprises use domestic credit to finance their business activities, thereby making domestic enterprises give up potential business opportunities. This is an example of the crowding-out impact of FDI inflows on private investment (Delgado & McCloud, 2017).

The Southeast region is considered a key economic zone with its most dynamic development in Ho Chi Minh City. It is the most developed economic region in Vietnam, contributing more than two-thirds of the annual budget revenue and having an urbanization rate of 50% (HIDS, 2020). The lack of investment capital in this region is partly compensated by attracting FDI inflows from other countries around the world with the incentive policies and regulations of local governments. It leads to the formation of high technology parks, export processing zones, and industrial zones. Meanwhile, the private sector plays an important role in this region with a high share of GDP and a high rate of job creation. However, with incentive policies such as tax reduction, cheap land lease, and convenient administrative procedures, whether FDI inflows will crowd out private investment in this region or not is the main objective of this study.

Despite the relevance of this topic, no research has been carried out for the Southeast region so far. Therefore, this study empirically investigates the effect of FDI inflows on private investment for a balanced panel data of six provinces in the Southeast region over the period 2005-2018 using the difference GMM Arellano-Bond estimator (D-GMM). The FE-IV estimator is applied to check the robustness of estimates.
The remainder of the paper is structured in the following way. The literature review in Section 2 presents the effect of FDI inflows on private investment. Section 3 describes the appropriate features of the D-GMM and FE-IV estimators via model specification and research data. The D-GMM estimates and the robustness check by the FE-IV estimator are given in Section 4 (empirical results). Section 5 summarizes the results and provides some important policy implications.

2. LITERATURE REVIEW

In the relevant literature, some studies support the crowd-out hypothesis while others provide empirical evidence to demonstrate the crowd-in hypothesis. Still others indicate mixed evidence on the effect of FDI inflows on private investment.

Regarding the crowd-out hypothesis, Farla, de Crombrugghe, and Verspagen (2016) and Morrissey and Udomkerdmongkol (2012) are among the primary contributions. These studies empirically investigate the influences of governance environment, FDI, and their interactions on private investment for a group of 46 developing countries by applying the one-step system GMM Arellano-Bond estimator. Both studies provide evidence that FDI inflows reduce private investment. Other studies, Eregha (2012); Kim and Seo (2003); Mutenyo, Asmah, and Kalio (2010); Szkorupová (2015); and Titarenko (2006), also find that FDI inflows decrease private investment. Wang (2010) notes that FDI reduces private investment but finds, using estimators of random effects, fixed effects, and GMM Arellano-Bond, that cumulative FDI stimulates it. Similarly, Pilbeam and Oboleviciute (2012) use the one-step GMM estimator for a sample of 26 EU countries from 1990 to 2008 and note a crowding-out impact of FDI on domestic investment for the older EU14 member states.

Conversely, 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) uses the system GMM Arellano-Bond estimator for a group of 91 developing countries over the period 1970-2000 and finds that FDI promotes private investment. In particular, he argues that the crowding-in effect of FDI inflows in the sample of low-income countries is conditional on the availability of human capital in the recipient countries. In the same vein, Munemo (2014) studies a group of 139 countries from 2000 to 2010 with the two-step difference GMM Arellano-Bond estimator. He shows that the crowding-in relationship between FDI inflows and private investment strongly depends on regulations and policies of business start-ups in host countries. He also finds that improving these regulations and policies may enhance the positive direction from FDI inflows to private investment. Recently, Boateng, Amponsah, and Baah (2017) show evidence on the crowding-in impact of FDI inflows on private investment for a group of 16 sub-Sahara African economies between 1980 and 2014 using the estimators of pooled OLS, fixed effect, and FMOLS. More recently, Jude (2018) finds that FDI inflows crowd in private investment for a group of 10 Eastern and Central European economies during 1995-2015 using the one-step system GMM Arellano-Bond estimator.
Some investigators show mixed results for the relationship between FDI inflows and private investment (Agosin & Machado, 2005; Ahmed, Ghani, Mohamad, & Derus, 2015; Apergis, Katrakilidis, & Tabakis, 2006; Onaran, Stockhammer, & Zwickl, 2013; Mišun & Tomšk, 2002). Lin and Chuang (2007), using a Heckman two-stage least squares (2SLS) estimator, find that FDI increases domestic investment of larger firms and decreases it for smaller firms in Taiwan (R.O.C) over 1993-1995 and 1997-1999. Similarly, Tan, Goh, and Wong (2016), using the PMG estimator, find that FDI has a crowding-in influence on gross private investment over the long run for a group of eight ASEAN economies from 1986 to 2011. In addition, using the ARDL test, Chen, Yao, and Malizard (2017) confirm that FDI inflows have a neutral relationship with private investment in China from Q1/1994 to Q4/2014. By regarding the entry mode set up by FDI enterprises, they find that wholly foreign-funded FDI inflows crowd out private investment, but equity joint venture FDI inflows crowd in.

3. MODEL SPECIFICATION AND RESEARCH DATA

3.1. Model specification

From the empirical model of Agosin and Machado (2005), we extend the empirical equation as follows:

\[ PIN_{it} = \beta_0 + \beta_1 PIN_{it-1} + \beta_2 FDI_{it} + X_{it}\beta' + \eta_i + \xi_{it} \]  

(1)

where subscripts \( t \) and \( i \) are the time and province index, respectively, \( FDI_{it} \) is net FDI inflow (% GDP), \( PIN_{it} \) is private investment (% GDP), and \( PIN_{it-1} \) is the lagged variable (the initial level of private investment). \( X_{it} \) is a set of control variables such as inflation, labor force, and infrastructure. \( \xi_{it} \) is an observation-specific error term while \( \eta_i \) is an unobserved province-specific, time-invariant effect, and \( \beta_0, \beta_1, \beta_2, \) and \( \beta' \) are estimated coefficients.

Some serious problems of econometrics emerge from estimating Equation (1). First, the presence of the lagged dependent variable \( PIN_{it-1} \) can lead to a high autocorrelation. Second, some variables such as labor force and inflation may be endogenous because they can correlate with the error term \( \eta_i \). Third, the panel data has a short observation length (\( T = 14 \)) and a small number of provinces (\( N = 6 \)). Finally, some unobserved time-invariant, province-specific characteristics like geography and anthropology can correlate with the independent variables. These fixed effects exist in the error term \( \eta_i \) and may make the OLS estimator inconsistent and biased. The fixed-effects model and random-effects model cannot handle endogenous phenomena and autocorrelation while the Pool Mean Group (PMG) and Mean Group (MG) estimators need a long observation length to estimate in both short-run and long-run. Besides, the IV-2SLS estimator requires some suitable instrumental variables which are out of independent variables in the model. Therefore, we decided to use the difference GMM estimator (D-GMM), which can handle simultaneity biases in regressions, as suggested by Judson and Owen (1999).
We apply the GMM (general method of moments) Arellano and Bond (1991) estimator first suggested by Holtz-Eakin, Newey, and Rosen (1988) to estimate Equation (1). Being a dynamic model, Equation (1) is taken in the first difference to eliminate province-specific effects. Next, we use the regressors in the first difference as instrumented by their lags with the condition that time-varying residuals in the original equations are not serially correlated (Judson & Owen, 1999).

The empirical model uses the Arellano-Bond and Sargan statistics to assess the validity of instruments in D-GMM. The Sargan tests with null hypothesis $H_0$: the instrument is strictly exogenous, which implies that it does not correlate with errors. In addition, the Arellano-Bond tests are applied to search the autocorrelation of errors in the first difference. Thus, the test result of errors in the first difference, $AR(1)$ is ignored but the autocorrelation of errors in the second difference, $AR(2)$ is tested to search the ability of the first autocorrelation of errors, $AR(1)$. Meanwhile, the FE-IV estimator is the instrumental variable regression for panel data with fixed effects in which the variables can be endogenous (Baum, Schaffer, & Stillman, 2007). The validity of instruments in the FE-IV estimator is also assessed through the Sargan statistic.

3.2. Research data

The main variables, private investment, FDI, labor force, consumer price index, and infrastructure, are extracted from the General Statistics Office of Vietnam (2020). The research sample contains balanced panel data of six provinces in the Southeast region (Binh Phuoc, Tay Ninh, Dong Nai, Binh Duong, Ba Ria Vung Tau, and Ho Chi Minh City) over the period 2005-2018.

The descriptive statistics are given in Table 1. The results show the average private investment in the period from 2005 to 2018 in the Southeast region is 15.193% with the lowest of 0.793% in Ba Ria-Vung Tau in 2007 and the highest of 36.971% in Binh Duong in 2005. Similarly, the average FDI in this region in the same period is 10.792% with the lowest being 0.49% in Ho Chi Minh City in 2016 and the highest being 48.460% in Binh Duong in 2006. The matrix of correlation coefficients is presented in Table 2. Labor force is positively connected with private investment while infrastructure is negatively linked to it. Correlation coefficients in Table 2 have values lower than 0.800, which removes the possibility of colinearity between variables in the empirical models.

Table 1. Descriptive statistics

| Variable                  | Obs  | Mean  | Std. Dev. | Min  | Max  |
|---------------------------|------|-------|-----------|------|------|
| Private investment (PIN, %)| 84.000 | 15.193 | 8.921     | 0.731 | 36.971|
| FDI (FDI, %)              | 84.000 | 10.792 | 9.893     | 0.490 | 48.460|
| Labor force (LAB, %)      | 84.000 | 55.080 | 6.143     | 41.700 | 65.500 |
| Consumer price index (INF, value) | 84.000 | 108.010 | 6.092 | 99.700 | 125.400 |
| Infrastructure (TEL, value) | 84.000 | 11.732 | 5.647     | 2.100 | 24.800 |
Table 2. The matrix of correlation coefficients

|       | PIN  | FDI  | LAB  | INF  | TEL  |
|-------|------|------|------|------|------|
| PIN   | 1.000|      |      |      |      |
| FDI   | 0.174| 1.000|      |      |      |
| LAB   | 0.228**| 0.437***| 1.000|      |      |
| INF   | 0.163| 0.163| -0.099| 1.000|      |
| TEL   | -0.389***| 0.085| -0.355***| 0.465***| 1.000|

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

4. EMPIRICAL RESULTS

4.1. D-GMM estimates

Table 3 presents the results estimated by D-GMM. Column 3 is the full model, while the reduced models without one and two variables, respectively, are given in Columns 1 and 2. Indeed, some variables are ruled out of the model to test the reliability of the estimated coefficients. The estimated results indicate that the significance, size, and sign of coefficients of FDI, inflation, and infrastructure are nearly unchanged. Infrastructure is detected to be endogenous in the estimation procedure, so the lags of infrastructure are used as instrumented while the remaining variables (private investment, FDI, labor force, and inflation) are used as instruments. Meanwhile, the Sargan tests in Table 3 show that the set of instruments is valid, and the Arellano-Bond AR(2) tests confirm no autocorrelation of the second order. Therefore, the model specification turns out to be reliable.

Unlike Farla et al. (2016) and Morrissey and Udomkerdmongkol (2012), we find that FDI inflows increase private investment, validating the “crowd-in hypothesis” of prior findings (Ang, 2009; Ang, 2010; Al-Sadig, 2013; Desai et al., 2005; Ndikumana & Verick, 2008; Tang et al., 2008). So, FDI inflows into the Southeast region are complementary to the private sector’s investment. It may stem from the fact that domestic investors can cooperate with foreign firms as suppliers of raw materials, partners in investment joint ventures, or subcontractors to foreign businesses. This finding also indicates that policies and regulations related to attracting FDI inflows in the Southeast region are appropriate and effective in promoting the economic activities of the private sector.

The empirical results also show that inflation stimulates private investment but infrastructure reduces it. The potential benefit of inflation is to increase savings–investments (Jin & Zou, 2005). Besides, inflation is also a factor that increases the price level, causing investment projects to increase capital. This finding can be found in Adams (2009) for the case of sub-Saharan Africa countries. However, an increase in inflation can lead to high prices of goods and cause social instability. Meanwhile, the negative impact of infrastructure on private investment in this area can stem from the fact that the majority of the infrastructure projects are financed by public investment that crowds out private investment.
### Table 3. FDI and private investment: D-GMM, 2005-2018

| Variables             | Model 1          | Model 2          | Model 3          |
|-----------------------|------------------|------------------|------------------|
| Private investment (-1) | -0.009 (0.104)  | 0.029 (0.105)   | 0.032 (0.106)  |
| FDI                   | 0.627*** (0.086) | 0.584*** (0.087) | 0.592*** (0.090) |
| Labor force           | 0.068 (0.163)    |                  |                  |
| Inflation             | 0.117** (0.056)  | 0.121** (0.058)  |                  |
| Infrastructure        | -0.025*** (0.006) | -0.031*** (0.007) | -0.031*** (0.007) |
| Observation           | 60.000           | 60.000           | 60.000           |
| AR(2) test            | 0.102            | 0.139            | 0.139            |
| Sargan test           | 0.537            | 0.736            | 0.669            |

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively; Dependent variable: Private investment (% GDP).

### 4.2. Robustness check

To test the robustness of the estimates, we apply the FE-IV estimator to re-estimate Equation (1). In line with D-GMM, the estimated results show that FDI crowds in private investment, supporting the “crowd-in hypothesis.” Besides, inflation also stimulates private investment but infrastructure reduces it.

### Table 4. FDI and private investment: FE-IV, 2005-2018

| Variables             | Coefficients |
|-----------------------|--------------|
| Private investment (-1) | 0.487 (0.084) |
| FDI                   | 0.239*** (0.065) |
| Labor force           | 0.045 (0.089) |
| Inflation             | 0.144** (0.064) |
| Infrastructure        | -0.020*** (0.007) |
| Observation           | 78.000 |
| Sargan test           | 1.644 |

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively; Dependent variable: Private investment (% GDP).
5. **CONCLUSIONS AND POLICY IMPLICATIONS**

Motivated by the fact that the Southeast region is considered one of the most dynamic areas that attract high FDI inflows, and in particular, no investigation on the relationship between FDI inflows and private investment has been carried out for this area, the study empirically examines the effect of FDI on private investment for a sample of six provinces in this area from 2005 to 2018 using the difference GMM Arellano-Bond estimator. The FE-IV estimator is applied to check the robustness of estimates. The empirical results indicate that FDI crowds in private investment. In addition, inflation and infrastructure are significant determinants of private investment in this area.

These findings suggest that policies and regulations in this area are appropriate in attracting FDI inflows from around the world, which promotes the investment activities of the private sector. However, some problems such as pollution, transfer pricing, and tax evasion caused by FDI enterprises also cause concerns. Therefore, the Southeast region as well as Vietnam needs to reform policies and regulations to attract more green FDI inflows to ensure sustainable development in the future.

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