



Does foreign investment crowd in domestic investment? Evidence from Vietnam



Van Ha^a, Mark J. Holmes^b, Tuyen Quang Tran^{c,*}

^a School of Business and Management, RMIT International University, Hanoi Campus, Viet Nam

^b Economics Department, School of Accounting, Finance and Economics, The University of Waikato, Private bag 3015, Hamilton, 3240, Waikato, New Zealand

^c International School, Vietnam National University, Building G7 & G8, 144 Xuan Thuy, Cau Giay District, Hanoi, Viet Nam

ARTICLE INFO

JEL classification:

D22
F21
F23
O12

Keywords:

Foreign direct investment
Domestic private investment
Crowding effects
Generalized method of moments estimation

ABSTRACT

This paper examines the linkages between foreign and domestic investment at sector level in a transitional economy. Using System Generalized Method of Moments estimation on a strong balanced dataset covering all sectors across the country, our results consistently suggest that foreign direct investment in Vietnam positively motivates domestic private investment in the same sector. Examination of the linkages finds evidence of crowding-in effects from foreign investment on domestic private investment in downstream sectors that have strong linkages with foreign investment in upstream sectors. No significant impact is found in upstream domestic investment that has linkages with foreign investment in downstream sectors. State-owned investment and joint-venture investment by foreign and domestic investors have a generally negative effect on the investment behavior of private investors. Domestic private investment in export-oriented sectors appears to be more responsive to the presence of foreign investment in both upstream and downstream sectors through vertical linkages.

1. Introduction

After the launch of “Doi moi” in 1986, the Vietnamese government aimed to attract foreign direct investment (FDI) in order to enhance economic productivity and to achieve sustainable growth during the transition. By adjusting certain requirements of the Enterprise Law, the government indirectly provided enterprises with substantial incentives that are particularly beneficial to large firms. Whereas multinationals and state-owned enterprises are large, most domestic private firms are small or medium-sized. However, the 2000 Enterprise Law along with some updates made it simpler for private firms to register and enter areas that earlier were reserved for state-owned companies. It also encouraged more unregistered firms to formalize their status. Moreover, the 2005 updated version of the Enterprise Law marked another steppingstone because it made no distinction between different categories of firm ownership in the regulatory framework. Essentially, the legal provisions discriminating between state-owned firms, FDI, and domestic private firms were removed. This step is considered to have paved the way for Vietnam's accession to the World Trade Organization (WTO) in 2007.

Foreign direct investment is regarded as an important source of economic growth, especially in developing countries. On the one hand, FDI may motivate local investment through the channels of competition, technology adoption, and human capital or on the other hand, may discourage domestic investment through competition (Aitken and Harrison, 1999; Javorcik, 2002; Kheng et al., 2017). If FDI

* Corresponding author.

E-mail addresses: van.hathicam@rmit.edu.vn (V. Ha), mark.holmes@waikato.ac.nz (M.J. Holmes), tuyentranquang@isvnu.vn (T.Q. Tran).

<https://doi.org/10.1016/j.inteco.2022.05.003>

Received 23 November 2021; Received in revised form 15 March 2022; Accepted 9 May 2022

Available online 13 May 2022

2110-7017/© 2022 CEPII (Centre d'Etudes Prospectives et d'Informations Internationales), a center for research and expertise on the world economy. Published by Elsevier B.V. All rights reserved.

fails to encourage the accumulation of capital or stifles local investment in the host country, then governments should question the benefit of FDI inflows into the economy. With their advantages in highly developed managerial skills, high levels of technology and larger size, FDI enterprises find it much easier than domestic private enterprises, with less skilled labour, outdated technology, and small size, to take advantage of government incentives. This situation provides the FDI sector with a greater likelihood of success in both domestic and foreign markets. In 2017 in fact, the FDI sector contributed around 70% of Vietnam's exports according to the Vietnam General Statistics Office ([Genreal Statistic Office, 2017](#)), and was found to have a negative impact on local company exports within the same sector ([Ha et al., 2020](#)), especially in the manufacturing industry, where it takes an average of around 50% of total FDI inflows into the economy ([Anwar and Nguyen, 2011](#)). While FDI plays an important role in Vietnam's exports ([Anwar and Nguyen, 2011](#); [Ha et al., 2020](#)), sectors that are export-oriented may attract more FDI and vice-versa. A sector that receives a high proportion of FDI is thereby enabled to become a bigger exporter and probably has a greater impact on local investment in that sector.

The objective of this study is to investigate how foreign investment at sector level influences domestic aggregated sectoral private investment. Since the linkages with FDI through various channels can be captured at the 4-digit sector level, we conduct a sectoral study to address the following research questions: (i) Does the presence of FDI encourage domestic private sectoral investment? (ii) Are there FDI spillover effects through linkages with domestic private aggregate sectoral investment? (iii) How do other types of investment, including state-owned and joint-venture investment, affect domestic private investment? (iv) Are sectors that are more engaged in exports likely to be more influenced by FDI than those that are not?

Our study adds new elements to the existing literature. *First*, unlike previous studies on developing countries that use country-level data or the limited number of studies on the survival of Vietnamese firms using firm-level data, we examine the crowding effects on local private investment using a sector-level dataset. Since the Vietnam Enterprise Survey (VES) of the chosen period allows us to employ a panel dataset at four-digit sector level, we are in a good position to take advantage of a strong balanced dynamic panel dataset for our analysis.

Moreover, the paper captures the dynamic relationship between investments and their lag values by using two-step system GMM estimation that can account for potential endogeneity and autocorrelations in the model. This is regarded as more efficient than other GMM estimators and is more robust than OLS, as well as fixed-effects and random-effects estimation of a dynamic relationship and dataset ([Arellano and Bond, 1991](#)). *Second*, our study is among the first in Vietnam to investigate the crowding effect by taking into account FDI spillovers that may occur through different channels at the 4-digit sector level. This approach allows the paper to provide a good picture of the crowding effect from FDI on domestic private investment among sectors in Vietnam. *Third*, this study contributes to the literature by looking more closely into effects in export-oriented sectors that have not been examined in the existing literature on Vietnam. While the contribution of FDI in Vietnamese exports appears to have increased, it is worth investigating whether that has benefited Vietnamese private investment in those sectors in any way.

The rest of the paper is structured as follows: Section 2 sketches the theoretical framework and empirical evidence. Section 3 outlines the methodology and data used in the study. Section 4 presents the results and analysis. Conclusions and policy implementation are discussed in Section 5.

2. Theoretical framework and literature review

2.1. Theoretical framework

By supplying advanced technology and providing infrastructure, such as transportation, telecommunications, etc., FDI may generate positive externalities that benefit domestic investment. In developing countries, especially in undeveloped sectors, such positive externalities are helpful to boost domestic investment, since domestic sectors may not have their own facilities and because it is costly to put in place all the necessary infrastructure ([Agosin and Machado, 2005](#); [Apergis et al., 2006](#)). In addition, raising the level of competition forces local plants to search for and invest in more effective modern technologies, or to use their capital and other resources more effectively ([Blomström et al., 2001](#)). [Javorcik \(2004\)](#) argues that FDI can increase capital inflows, such as portfolio investment or foreign loans, which may help to reduce interest rates in the domestic money market and then increase domestic investment.

However, it is also argued that foreign investment may crowd out local investment. FDI frequently enters the domestic market with advanced technological and managerial experience, and even tax incentives provided by the host government, and may present a risk for domestic enterprises ([Noorzoy, 1979](#)). FDI firms may displace local producers or force local plants to reduce their output, then reduce future investment ([De Mello, 1999](#)). Domestic investment can also be crowded out because of new, superior technologies brought to the domestic market by FDI. With a lower level of technology, domestic firms cannot compete and lose profit, resulting in a reduction in their production and investment ([Deok-Ki Kim and Seo, 2003](#)).

The crowding-out effect of FDI on local investment is seen at its worst if it forces local plants to abandon the market. Theory shows how FDI affects the survival of local firms. FDI enters the domestic market, increases competition, and in this way forces local firms out of the market, according to [Aitken and Harrison \(1999\)](#) and [Blomström and Kokko \(1998\)](#). Competition in the host country market increases with the presence of foreign direct investment, which has an advantage in final goods markets. This state of affairs results in lower market prices, which may lead to fewer advantages for local enterprises and force them to give up on the market ([Navaretti et al., 2004](#)).

Theoretically, there are two types of FDI effect on local investment at firm level: horizontal linkages (competition between enterprises within an industry), and vertical linkages (the relationship between enterprises across industries). It is argued that for horizontal linkages, FDI enterprises frequently take the place of domestic firms through competition and the mobility of labour ([Blomström and Kokko, 1998](#)). Conversely, through vertical linkages, FDI may encourage local firms to expand their business. Domestic firms will have

greater interaction with FDI enterprises by supplying intermediate products or selling products for FDI firms (Markusen and Venables, 1999). Overall, according to Agosin and Machado (2005), crowding-in or crowding-out effects from FDI on local firms differ from country to country because of differences in the host country's policies, the structure of its economy, the type of FDI inflow, and the character and strength of local enterprises.

2.2. Empirical evidence

In a range of studies, scholars have examined whether FDI crowds out or crowds in local investment in both developing and developed countries. An important study is that of Agosin and Machado (2005), who are among the first researchers to develop the theoretical model for investment that applies the FDI variable and its estimations to a panel dataset. Their finding shows that foreign investment leaves domestic investment unchanged in some cases or replaces it in others. In a more recent study, crowding effects are examined in 46 developing countries (Morrissey and Udomkerdmongkol, 2012, 2016) from 1996 to 2009 using system GMM estimation. Morrissey and Udomkerdmongkol find evidence to support the crowding-out effect, which means foreign investment discourages their domestic counterparts in the host country. Reviewing and going beyond Morrissey and Udomkerdmongkol (2012), Farla et al. (2016) revise the former's models and estimation technique, and argue that the results depend on the estimation method and the exact nature of the dependent variables. They come to the opposite conclusion, suggesting that foreign investment raises the overall level of domestic investment, and in this way supports the case for a crowding-in effect.

Other studies find crowding-in effects at firm level. Jansen (1995) discovers a crowding-in effect from export-oriented FDI on local investment in Thailand while Wu, Sun, and Li (2012) and Chen et al. (2017) confirm that FDI has a crowding-in effect on local firms in China. There is evidence of the crowding-in effect in India (Rath and Bal, 2014) and Uganda (Ahmed et al., 2015) Rath and Bal (2014). The crowding-in effect is also confirmed in some European countries, including Hungary and the Czech Republic (Jan Mišun, 2002; Kosova, 2010; Mišun and Tomšík, 2002).

In other cases, there is evidence that the presence of FDI leads to a decrease in local investment. Jan Mišun (2002) finds strong evidence that FDI crowded out local investment in Poland from 1990 to 2000, while De Backer and Sleuwaegen (2003) report that FDI crowded out local investment in Belgium. FDI was also found to displace local investment from 1971 to 2000 in some Latin American countries, but not in Asian and African countries, according to Agosin and Machado (2005). In the case of US manufacturing industries, Mullen (2010) finds evidence that an increase in outward FDI stock is associated with a decrease in both domestic capital stock and flows in a particular industry. Similarly, Wang (2013) concludes that because of the competition brought by multinationals in the same industry, local firms seemed to have shorter lives and more closures in Canada from 1973 to 1997. Chen et al. (2017) indicate that wholly foreign-owned enterprises crowded out indigenous enterprises in China from 1994 to 2014.

Some early studies have focused on FDI crowding effects in Vietnam, mostly at firm level. Using the Cox hazard model, Kokko and Thang (2014) provide a general picture of how FDI affected local firm survival in Vietnam between 2001 and 2008. The results show a positive effect from downstream FDI on the survival of local enterprises, whereas upstream FDI is found to reduce the lifespan of domestic private enterprises. Pham (2016) uses firm-level data from the Vietnam Enterprise Survey from 2001 to 2010 to investigate the relationship between FDI and local firm investment and finds that an increase in foreign capital in Vietnam leads to a decrease in local company investment at firm level but not at industry level. Vu, Yamada, and Otsuki (2017) conclude that the survival of foreign-invested firms depends on the type of ownership and the nationality of the owners. Joint ventures with entities other than state-owned enterprises (SOEs) are more likely to fold than joint ventures between SOEs and FDI firms.

Unlike other studies on Vietnam, which focus on firm survival at firm level, and in contrast with existing literature on developing countries which explores the linkage between foreign and domestic investment at country level, our study examines the linkage at sector level. In our study, in order to take advantage of the spillover effects that occur through various channels captured at sector level, we focus on crowding effects at the 4-digit sector level. Applying system GMM estimation to a 6-year balanced panel dataset covering a more recent period, our paper fills the gap in the literature on Vietnam about the crowding effects from FDI on domestic private investment.

3. Methodology and data

3.1. Empirical strategy

We are interested in the crowding effect, if it exists, from foreign direct investment on domestic private investment in Vietnam, and we take into account all sectors at the 4-digit level across the country. We investigate the linkages by estimating Equation (1) below.

$$DP_{j,t} = \beta_1 FDI_{j,t} + \beta_2 X_{j,t} + \alpha_j + u_{j,t} \quad (1)$$

where DP refers to total domestic private investment, and FDI is total foreign direct investment which is wholly foreign-owned at sectoral level. X is a vector of control variables found in the literature to affect domestic private investment in a dynamic relationship. α_j is the fixed sector effect and u_j is the error term. j represents the sector at the 4-digit level and t denotes time.

The modelling about investment follows the approach of Agosin and Machado (2005), Morrissey and Udomkerdmongkol (2012) and Farla et al. (2016), who look at crowding effects from foreign on local investment in developing countries at country level. In the model proposed by Agosin and Machado (2005), total investment in an industry is the combination of investment from both the domestic sector ($I_{d,t}$) and the foreign sector ($I_{f,t}$), as follows:

$$I_t = I_{d,t} + I_{f,t} \tag{2}$$

where domestic investment comprises domestic private investment, state-owned investment and joint-venture investment. Thus, at sector level, investment in Equation (1) becomes:

$$I_{j,t} = DP_{j,t} + DS_{j,t} + JV_{j,t} + FDI_{j,t} \tag{3}$$

where *DS* is domestic state-owned investment and *JV* is joint-venture investment, where both are related to domestic private investment. All the investment values here are net investment, excluding depreciation. It is assumed that total sales in a sector related to the total investment of that sector the current year are due to an expectations effect, and so we include total sales to account for some of the sector's characteristics. Therefore, our vector of control variables ($X_{j,t}$) consists of state-owned investment (*DS*), joint venture investment (*JV*), and total sales at sector level (*Totsales*). A year dummy is also included to account for macroeconomic factors, for instance economic growth, interest rate, expectation and policy changes.

To address any potential issues arising from the endogeneity and dynamic relationships between investments and their lags, we follow Morrissey and Udomkermongkol (2012), and Farla et al. (2016), and apply system GMM estimation, an approach proposed by Arellano and Bover (1995) and then fully developed by Blundell and Bond (1998). The model consists of level (Equation (4)) and difference (Equation (5)). This advanced system GMM estimation which we employ constructs a system of two equations, the original and the transformed equations. The set of equations is as follows.

The level equation:

$$DP_{j,t} = \gamma DP_{j,t-1} + \beta_1 FDI_{j,t} + \beta_2 X_{j,t} + \alpha_j + u_{j,t} \tag{4}$$

The difference equation:

$$DP_{j,t} - DP_{j,t-1} = \gamma (DP_{j,t-1} - DP_{j,t-2}) + \beta_1 (FDI_{j,t} - FDI_{j,t-1}) + \beta_2 (X_{j,t} - X_{j,t-1}) + (u_{j,t} - u_{j,t-1}) \tag{5}$$

The potential issue in Equations (4) and (5) is that not only may the dependent variables (most notably *FDI*) be endogenous, but also the error terms in both equations are correlated with the lagged values of the dependent variable, now become regressors. System GMM estimation therefore requires instrumental variables to deal with this problem. As suggested by Arellano and Bover (1995), Roodman (2009) Aggarwal et al. (2011), lagged values on the level of the regressors are used as the instrumental variables for the dependent variables in Equation (4). Similarly, lagged values of the difference in the independent variables are used as the instrumental variables for the independent variables in Equation (5).

To secure the validity and consistency of GMM estimation, we also apply two specification tests, as suggested by Arellano and Bond. These include the Sargan/Hansen test for over-identification and Arellano-Bond test for autocorrelation. According to Roodman (2009), a crucial assumption for the validity of GMM estimation is that the instruments are exogenous. The Sargan/Hansen test is for the joint validity of the instruments, which is expected to fail to reject the null hypothesis that the instruments as a group are exogenous. It is also important to mention that system GMM estimation is consistent if the idiosyncratic errors are not auto-correlated at second order for Equation (5). The Arellano-Bond test is applied to the residuals in order to test for autocorrelation aside from the fixed effects, in which they provide the test for first- and second-order autocorrelation (AR1 and AR2, respectively). Failure to reject the null hypothesis for the second-order autocorrelation guides us towards employing GMM estimation (Roodman, 2009).

We then extend our model to account for the FDI spillovers that may occur within and between sectors. As the study examines the influence of FDI on local private investment at sectoral level, it is also worth accounting for the sectoral linkages that FDI has with local counterpart firms. While horizontal linkages capture the link between foreign and local plants within sectors, backward linkages show the link between foreign customers and their local input suppliers and forward linkages indicate the link between foreign suppliers and their local customers. Following Newman et al. (2015), Fujimori and Sato (2015), Javorcik (2004) and Jude (2012), spillovers are calculated as follows.

$$Hlinkages_{jt} = \frac{\sum_{j=1}^n FIsales_{jt}}{\sum_{j=1}^N sales_{jt}} \tag{6}$$

where $Hlinkages_{jt}$ represents the ratio of total sales of foreign enterprises in sector *j* in time *t* to the total sales of enterprises in sector *j* in time *t*. $FIsales_{jt}$ captures the total sales of foreign enterprises in sector *j*; $sales_{jt}$ is total sales of sector *j*. Therefore, $Hlinkages$ can refer to a market-stealing effect (Aiken and Harrison). That is, if FDI dominates sales of a particular sector, then FDI appears to steal market share away from local plants and that may crowd out domestic investment.

Backward and forward linkages are obtained as follows:

$$Blinkages_{jt} = \sum_{j \neq k} a_{kt} * Hlinkages_{kt} \tag{7}$$

where $Blinkages_{jt}$ represents the linkages between domestic suppliers in upstream sector *j* and their foreign buyers in downstream sector *k*. $a_{(kt)}$, $k \neq j$ is the share of sector *j* output supplied to sector *k*.

$$Flinkages_{jt} = \sum_{h \neq j} b_{ht} * Hlinkages_{ht} \quad (8)$$

$Flinkages_{jt}$ captures the linkages between foreign suppliers and their domestic buyers and $b(ht)$ is calculated as the total of intermediate goods from sector h to sector j divided by the total output of sector h .

3.2. Data

The data used in this research is at the 4-digit sector level. The data for the investment of firms located in Vietnam is available from the Vietnam Enterprise Survey (VES) dataset and is collected by the Vietnam General Statistics Office. The dataset comprises firm-level data that covers every active registered firm in all sectors throughout the country.¹ The whole dataset contains 397 consistent sectors, making it a strong balanced panel dataset of 2382 observations over a 6-year period (2010–2015). We capture the effect of FDI in terms of the amount of new investment at the four-digit sector level. Domestic investment includes private, state-owned and joint-venture investment. Total sales (*totalsales*) is the sum of sales from all firms (both local plants and multinationals) in the same 4-digit sector. We group the data each year by sector code to compute this series, which is calculated separately for each year before being merged to construct the final panel dataset. All values are deflated using the Producer Price Index (PPI).² Table 1 below offers a description of the dataset employed in this study.

Horizontal linkages are obtained from the VES dataset following Equation (6). To calculate the linkages with the presence of foreign investment at sector level, we link the sector code in the VES dataset with the input-output (IO) table. We use the Leontief matrix from the IO2012 table to calculate backward and forward linkages. Backward linkages indicate downstream customer links with their suppliers in upstream sectors. In Equation (7), a is calculated from indexes using columns in the Leontief matrix that then allows us to obtain backward linkages. Forward linkages represent the links between customers in the upstream sectors who buy products from downstream sellers. In Equation (8), b is computed from the indexes by rows in the Leontief matrix³ which then becomes available to use that equation to compute forward linkages. We also provide information about correlations between the variables in Table 2 below.

4. Empirical results and discussion

4.1. Crowding effects on domestic private aggregate investment

We proceed with our model with GMM estimation. Since System GMM can be regarded as more robust and efficient under conditions of heteroscedasticity and autocorrelation (Roodman, 2009) compared with difference GMM, we choose to apply system GMM estimation using the one- and two-step procedures. Table 3 reports the results.

Our estimates meet the requirement for the validity of the GMM approach where the number of instruments remains below the number of groups in all regressions. The instrument proliferation does not overfit the endogenous variables. The p-value for the Hansen test indicates no over-identification among the instruments. The results also indicate the absence of first and second order autocorrelation of the residuals. The p-value attached to the Arellano-Bond test for second order autocorrelation (AR2) confirms the null hypothesis of no second-order serial correlation. Year dummies are included in all regressions to capture macroeconomic effects. Since the two-step GMM regression approach is regarded as more efficient than the one-step approach (Roodman, 2009), the following discussion is mainly focused accordingly. The first lag of domestic private investment significantly reinforces the presence of a dynamic relationship and the appropriate use of GMM estimation.

The overall results indicate a significant crowding-in effect from our main variable of interest, FDI at the sector level. We find a significant positive effect on current FDI and the first lag of FDI and a light negative impact from the third lag of FDI. The results suggest that at the 4-digit sector level, one billion VND invested by foreign firms in the current year has led to an increase of 0.388 billion VND in domestic private investment in the same sector in the same year. An increase in FDI of one billion VND the previous year resulted in a 0.358 billion VND increase in domestic private investment this year. There may also be externality effects because one of the most common methods used by provincial governments in Vietnam to attract more FDI is to improve infrastructure, such as transportation, logistics and telecommunications, that create positive externalities for both foreign and domestic sectors (World Bank, 2017). While the coefficient on the third lag of foreign investment is negative (−0.095), the net effect is still positive.

This result confirms that FDI had a significant positive impact on local investment in Vietnam at the 4-digit sector level during the 2010–2015 period. With a high degree of openness, the Vietnamese economy experienced a sharp increase in FDI inflow during this period. Since local firms are undeveloped compared to multinationals, FDI is expected to create competitive pressure that may force domestic investment in the same sector to be more productive and efficient. It is recognized that while foreign-invested private firms and state-owned firms have preferential access to land, credit, and government procurement, domestic private firms do not enjoy these benefits (World Bank, 2017). This leads to an unbalanced environment for domestic firms to engage in fair competition in both the input

¹ Details about sector levels can be found in the Vietnamese Standard Industrial Classification: <https://www.gso.gov.vn/wp-content/uploads/2019/03/VSIC-2007.pdf>.

² PPI data is available at: <https://www.ceicdata.com/en/vietnam/producer-price-index-2010100>. Year 2010 is the base year, 2010 = 100.

³ More information about the calculation of backward and forward linkages can be found at: <https://www.gso.gov.vn/du-lieu-va-so-lieu-thong-ke/2019/04/bang-can-doi-lien-nganh-input-output-i-o-cua-viet-nam-2/>.

Table 1
Data description.

Variable	Observations	Mean	Std. Dev.	Min	Max
<i>DP</i>	2382	1744.115	41733.74	−233175.1	1944226
<i>DS</i>	2382	649.4375	9731.866	−97603.04	300760
<i>FDI</i>	2382	454.1796	15045.13	−103500.1	680499.9
<i>JV</i>	2382	312.0683	4371.132	−8733.063	192561.9
<i>Totsales</i>	2382	27122.07	72335.84	−72885.23	1132468
<i>Hlinkages</i>	2382	0.241	0.266	0	0.998
<i>Blinkages</i>	2382	0.262	0.355	0	1.62
<i>Flinkages</i>	2382	0.415	1.058	0	8.047

Source: Authors' calculation from VES for the investment variables. Investment values are in billions of dong

Table 2
Correlation table.

	<i>DP</i>	<i>DS</i>	<i>FDI</i>	<i>JV</i>	<i>Totsales</i>	<i>Hlinkages</i>	<i>Blinkages</i>	<i>Flinkages</i>
<i>DP</i>	1							
<i>DS</i>	0.156	1						
<i>FDI</i>	0.1222	0.1656	1					
<i>JV</i>	0.1526	0.4712	0.1709	1				
<i>Totsales</i>	0.0556	0.3224	0.3402	0.1631	1			
<i>Hlinkages</i>	0.0007	0.0013	0.0006	0.002	0.0076	1		
<i>Blinkages</i>	−0.0125	−0.0083	−0.0038	0.0813	0.0429	0.0158	1	
<i>Flinkages</i>	0.0018	0.0093	−0.0057	0.0676	0.054	0.0061	0.3714	1

Source: Authors' calculation from VES

and output markets. Thus, the increase in foreign investment in the same sector in the past may encourage private domestic firms to invest more in current years in order to compete with multinationals. Surprisingly, this conclusion shows that in a couple of years, negative competition effects may outweigh any positive influence from FDI on local investment, leading domestic private counterparts to invest less in the present. However, the net effects over the years are still positive, indicating that the presence of FDI encourages local investment. Other types of investment, including current public state-owned (*DS*) and joint-venture (*JV*) investment appear to have an insignificant impact on private investment. However, the estimated coefficients attached to the lagged variables (*DS*(*t*-1) and *JV*(*t*-1)) appear to be negative and significant.

To check for overall impact of all types of investment on domestic private investment, we also carried out estimation incorporating total investment of all other types (*DS*, *FDI* and *JV* combined as one variable). The results reported in the Appendix [Table A1](#) show that after controlling for the country context and macroeconomics circumstances, all other investment (*OTHERIN*) has a positive impact on the domestic private investment in the same industry. This suggest a crowding-in impact from other investment that can be explained by the externalities (better infrastructure, higher level of technology for instance) brought by other investments from foreign and state-owned investors (Agosin and Machado, 2005; Apergis et al., 2006). Overall, we find evidence to support our conclusion that the presence of FDI encourages domestic sectoral private investment. Our finding is in line with existing studies of developing countries where crowding-in effects are found (Chen et al., 2017; Farla et al., 2016; Rath and Bal, 2014). Nevertheless, our finding contrasts with a range of other studies of developing countries (Agosin and Machado, 2005; Ahmed et al., 2015; Chen et al., 2017; Morrissey and Udomkermongkol, 2012) and developed countries (Kosova, 2010; Mišun and Tomsfk, 2002; Pilbeam and Oboleviciute, 2012) that find strong evidence of a crowding-out effect. Our findings are consistent with Pham (2016), who finds a crowding-in effect at firm level but differ to some extent from results in the Vietnamese literature, such as the study conducted by Kokko and Thang (2014), which reports that foreign firms seem to lessen the probability that domestic private enterprises will have a long lifespan.

4.2. FDI spillover effects

Our extended estimations provide a closer look at the linkages that local investors have with their foreign peers, within and between industries. With respect to the variable *FDI*, we find consistent evidence of an FDI crowding-in effect on domestic private investment in all regressions. However, horizontal spillovers (*Hlinkages*) has a significant indirect negative effect on domestic private investment. This means that the presence of FDI in the same sector may drive demand away from domestic counterparts, forcing them to invest less. In considering this market-stealing effect, however, if we add the coefficients from FDI investment and horizontal spillovers that occurs in the same sector, there is an overall crowding-in effect from FDI on local private investment. While no significant backward spillovers (*Blinkages*) are found, forward channels (*Flinkages*) generate strong positive spillovers on domestic investment. Since forward spillover occurs when local firms in downstream sectors buy inputs/material from foreign suppliers in upstream sectors, this process may lead to an increase in domestic investment in downstream sectors. [Table 4](#) provides more detail.

As a foreign direct investment crowding-in effect has been found, several extended estimations are conducted to examine the crowding effect in sectors that are strongly linked with the presence of foreign investment through various channels. Dummy variables represent large FDI-linked sectors and are included in our models. *Hlarge* shows sectors whose total sales are dominated by FDI, and

Table 3

The impact of foreign investment on domestic investment: Baseline - GMM estimations
 Dependent variable: Present domestic private investment (DP) at sector level in billions of VND.

VARIABLES	(1)	(2)
	One-step	Two-step
<i>DP</i> _(t-1)	0.487*** (0.124)	0.472*** (0.114)
<i>DS</i>	0.210 (0.140)	0.0440 (0.160)
<i>DS</i> _(t-1)	-0.966*** (0.211)	-0.569** (0.224)
<i>DS</i> _(t-2)	-0.200 (0.189)	-0.199* (0.111)
<i>FDI</i>	0.360*** (0.0620)	0.388*** (0.0631)
<i>FDI</i> _(t-1)	0.346*** (0.102)	0.358*** (0.0920)
<i>FDI</i> _(t-2)	-0.0243 (0.0828)	-0.0905** (0.0424)
<i>JV</i>	7.565*** (2.079)	1.805 (2.931)
<i>JV</i> _(t-1)	-1.888*** (0.626)	-1.658*** (0.469)
<i>JV</i> _(t-2)	0.144 (0.262)	0.0452 (0.117)
<i>Totsales</i>	0.0224*** (0.00836)	0.0168*** (0.00555)
Year dummy	Yes	Yes
Constant	-16,989*** (2034)	5486*** (1220)
Observations	1588	1588
Number of groups	397	397
Number of instruments	29	29
AR1	0.000	0.009
AR2	0.000	0.650
Sargan	0.000	0.000
Hansen	-	0.111
Difference in Hansen	0.000	0.142

Notes: Robust standard errors in parentheses (***p < 0.01, **p < 0.05, *p < 0.1). Model (1) is one-step system GMM estimation and two-step is model (2). P-values are reported for the Arellano-Bond test for second-order autocorrelation. AR(2) confirms that there is no second-order serial correlation in the models in the two-step system GMM estimation. The number of instruments (30) is less than the number of groups (397) in all regressions. P-values reported for the Sargan and Hansen test confirm the validity of the instruments.

equals 1 if a sector has more than 50% (*Hlinkages* > 0.5) of its sales accounted for by foreign firms and 0 otherwise. Around 12% of the sample have strong horizontal linkages with FDI. Similarly, *Blarge* is a dummy variable representing sectors that have a strong link with FDI through backward channels (*Blinkage* > 0.5) and *Flarge* represents a strong link through forward linkages (*Flinkages* > 0.5). Approximately 13% of the sectors in the sample are strongly linked with FDI through backward linkages and around 15% are forward-linked sectors with a high level of FDI presence.⁴ Table 5 presents the results.

Consistent evidence confirms that FDI has a crowding-in effect on local private investment in all estimations, seen in both Tables 4 and 5. There are significant, positive coefficients on *FDI* and its first lag, positive coefficients on *Flinkages*, and negative coefficients on *Hlinkages*, a result which is consistent with other regressions in the study. While the market-stealing impact remains, there is no significant evidence that being in a sector with a strong FDI presence (*Hlarge*) discourages domestic private investment more than in those sectors with less FDI presence. Or in other words, a market-stealing impact on domestic private investment does not get stronger in those sectors with a high level of FDI presence. For the case of strong backward linkages, *Blarge* is also insignificant. We do find however, that *Flarge* is positive and significant. This suggests that those sectors that are strongly linked with FDI through forward linkages are characterized by higher private investment. Local plants in downstream sectors might have to increase their investment if they buy inputs, machine or production processes from FDI providers, since the cost of those things is typically higher than buying from local suppliers. That, in turn, results in a rise of aggregate investment at the sector level for downstream sectors which have a strong link with FDI suppliers in upstream sectors.

⁴ A report on sectors in the sample most highly linked with FDI through various channels is available on request.

Table 4
FDI spillover effect.

VARIABLES	(1)	(2)
	One-step	Two-step
$DP_{(t-1)}$	0.365*** (0.0949)	0.342*** (0.0553)
DS	0.518*** (0.0978)	0.222* (0.132)
$DS_{(t-1)}$	-0.618*** (0.161)	-0.0650 (0.159)
$DS_{(t-2)}$	0.0956 (0.135)	-0.0775 (0.0649)
FDI	0.311*** (0.0448)	0.307*** (0.0476)
FDI_(t-1)	0.193** (0.0776)	0.252*** (0.0457)
$FDI_{(t-2)}$	-0.165** (0.0640)	-0.192*** (0.0317)
JV	9.289*** (1.309)	-0.782 (2.258)
$JV_{(t-1)}$	-1.539*** (0.414)	-0.976*** (0.231)
$JV_{(t-2)}$	-0.155 (0.176)	-0.184*** (0.0677)
$Totsales$	0.0274** (0.00611)	0.0242** (0.00382)
Hlinkages	-0.3006 (0.4274)	-0.2841* (0.1455)
$Blinkages$	0.3134 (0.5469)	0.0367 (0.1638)
Flinkages	-0.0736 (0.2146)	0.2095** (0.0960)
$Year\ dummy$	Yes	Yes
Constant	1121 (1132)	-831.5 (534.9)
Observations	1588	1588
Number of groups	397	397
Number of instruments	54	54
AR1	0.000	0.045
AR2	0.000	0.682
Sargan	0.000	0.000
Hansen	-	0.330
Difference in Hansen	0.000	0.335

Notes: Robust standard errors in parentheses (***p < 0.01, **p < 0.05, *p < 0.1). Model (1) is one-step system GMM estimation and two-step is model (2). P-values are reported for the Arellano-Bond test for second-order autocorrelation. AR(2) confirms that there is no second-order serial correlation in the models. The number of instruments (54) is less than number of groups (397) in all regressions. P-values reported for the Sargan and Hansen test confirm the validity of the instruments.

4.3. Are export-oriented sectors more influenced by FDI?

FDI may influence domestic investment differently due to the characteristics, market-orientation and development level of the sector under consideration. Ipek and Kizilgöl (2015) argue that FDI may lead to crowding-in effects on domestic export-oriented sectors through advanced technology, managerial skills, marketing techniques and opportunities to expand into international markets, and Chang (2005) confirms that it is a causal relationship. Vietnam has applied consistent policies towards developing an export-oriented economy. According to the World Bank (2017), Vietnam has become one of the most open economies in the world, with a nearly 180% trade-to-GDP ratio. While Vietnam's export performance has demonstrated increased competitiveness, with an annual growth rate of 9.8% from 2006–14, the presence of FDI plays a key role in the process because it contributes roughly 70% of total exports from Vietnam (World Bank, 2017). In an earlier study, FDI was found to have had a significant effect on the exporting behavior of Vietnamese firms (Ha et al., 2020).

In order to test whether domestic private investment in export-oriented sectors gains more from the presence of FDI, we take a closer look at this relationship. We create dummy variables capturing exports (Exp), with a value of 1 if that sector is export-oriented and 0 otherwise, and interaction between Exp and FDI ($Expfdi$). $ExpH$, $ExpB$, $ExpF$ indicate interactions between export orientation and horizontal, backward and forward linkages, respectively. According to the Ministry of Industry and Trade (MOIT), an export-driven sector is one that has an export volume equal to or above USD100 million per year. Information concerning which sector has the potential to be export driven – so designated by the government – is obtained from MOIT (Ministry of Industry and Trade, 2019). According to the report, around 50 sectors at the 4-digit level are export oriented. We apply the same GMM technique, where we include

Table 5
Impact on the larger FDI-linked sectors.

Variables	(1)	(2)	(3)
$DP_{(t-1)}$	0.324*** (0.0501)	0.356*** (0.0552)	0.290*** (0.0575)
DS	0.228** (0.112)	0.305*** (0.110)	0.299** (0.133)
$DS_{(t-1)}$	-0.104 (0.141)	-0.166 (0.140)	-0.145 (0.162)
$DS_{(t-2)}$	-0.0652 (0.0566)	-0.0537 (0.0576)	-0.0209 (0.0775)
FDI	0.309*** (0.0394)	0.293*** (0.0392)	0.279*** (0.0440)
FDI_(t-1)	0.264*** (0.0381)	0.264*** (0.0394)	0.305*** (0.0471)
FDI_(t-2)	-0.184*** (0.0302)	-0.194*** (0.0294)	-0.171*** (0.0328)
JV	-0.389 (2.085)	0.0247 (2.158)	-0.684 (2.477)
$JV_{(t-1)}$	-1.000*** (0.200)	-0.974*** (0.210)	-1.013*** (0.274)
$JV_{(t-2)}$	-0.182*** (0.0594)	-0.228*** (0.0581)	-0.209** (0.0953)
$Totsales$	0.0247** (0.00358)	0.0246** (0.00363)	0.0276** (0.00449)
Hlinkages	-0.2535* (0.1477)	-0.3324** (0.1438)	-0.4246** (0.1662)
Blinkages	-0.0763 (0.1574)	0.3498 (0.3252)	0.1895 (0.2996)
Flinkages	0.2069** (0.0915)	0.2015** (0.0987)	0.9980*** (0.2796)
Hlarge	0.0089 (0.0081)		
Blarge		-0.2394 (0.2894)	
Flarge			2.9879*** (0.9617)
Year dummy	Yes	Yes	Yes
Constant	-867.2* (467.1)	1115*** (397.8)	-379.3 (516.1)
Observations	1588	1588	1588
Number of groups	397	397	397
Number of instruments	54	54	54
AR1	0.042	0.037	0.026
AR2	0.663	0.651	0.696
Sargan	0.000	0.000	0.000
Hansen	0.398	0.329	0.494
Difference in Hansen	0.206	0.275	0.292

Notes: Robust standard errors in parentheses (**p < 0.01, *p < 0.05, *p < 0.1). Two-step system GMM estimation is applied in all regressions. Model (1) includes a dummy variable representing sectors that have strong links with the presence of FDI through horizontal linkages (Hlinkage > 0.5). Model (2) includes a dummy variable representing sectors that have a strong link with the presence of FDI through backward linkages (Blinkage > 0.5). Model (3) includes a dummy variable representing sectors that have strong links with FDI presence through forward linkages (Flinkage > 0.5). P-values reported for the Arellano-Bond test for second-order autocorrelation AR(2) confirm that there is no second-order serial correlation across the models. The number of instruments (54) is less than the number of groups (397) in all regressions. P-values reported for the Sargan and Hansen test confirm the validity of the instruments. Year dummies are included.

interactions between the dummy variables and FDI as additional explanatory variables. The results are reported in Table 6. Based on the type of multiplicative dummy variable that is included, a range of potential benefits from FDI is considered. Columns (1) and (2) show the difference that being an export-oriented sector can potentially make.

We find significant positive coefficients on FDI in all regressions, confirming that FDI has a crowding-in effect on local private investment and the results tell the same story with the linkages. With regard to export, being an export-oriented sector does encourage domestic private investment (the coefficient of Exp in column 1 is positive and significant), while being an export-oriented industry with the presence of FDI (as reflected by the negative coefficient attached to $Expfdi$) appears to discourage domestic private investment. Domestic investment in export-oriented sectors where FDI is present gains no benefits from FDI presence because the international market share in that sector is dominated by foreign firms (Ha et al., 2020). Sectors that also have links with FDI through backward linkages appears to invest more than others ($ExpF$ in column 2). No such effect occurs if export-oriented sectors have linkages with FDI through horizontal channels and a negative effect occurs for export-oriented sectors though forward linkages. This reveals that FDI in

Table 6
The impact of FDI on domestic investment in exporting and manufacturing sectors.

Variables	(1)	(2)
<i>DP</i> _(<i>t</i>-1)	0.491*** (0.0708)	0.332*** (0.0453)
<i>DS</i>	0.337*** (0.118)	0.277*** (0.0828)
<i>DS</i> _(<i>t</i>-1)	-0.222 (0.159)	-0.304** (0.118)
<i>DS</i> _(<i>t</i>-2)	0.0745 (0.0804)	-0.0935** (0.0406)
<i>FDI</i>	0.417*** (0.0531)	0.348*** (0.0262)
<i>FDI</i> _(<i>t</i>-1)	0.121** (0.0538)	0.276*** (0.0298)
<i>FDI</i> _(<i>t</i>-2)	-0.228*** (0.0403)	-0.132*** (0.0262)
<i>JV</i>	6.082*** (2.102)	2.773** (1.371)
<i>JV</i> _(<i>t</i>-1)	-1.177*** (0.258)	-0.998*** (0.146)
<i>JV</i> _(<i>t</i>-2)	-0.307*** (0.0834)	-0.123*** (0.0440)
<i>Totsales</i>	-0.0399*** (0.00776)	-0.0374*** (0.00414)
<i>Hlinkages</i>	-0.1865 (0.1643)	-0.398** (0.169)
<i>Blinkages</i>	-0.5272 (0.3933)	-1.525** (0.371)
<i>Flinkages</i>	0.5448 (0.740)	0.549*** (0.173)
<i>Exp</i>	11,171* (6604)	
<i>Expfdi</i>	-0.558*** (0.0959)	
<i>ExpH</i>		0.907 (0.569)
<i>ExpB</i>		1.205*** (0.423)
<i>ExpF</i>		-0.777*** (0.269)
Year dummy	Yes	
Constant	-189.9 (646.2)	1029** (508.3)
Observations	1588	1588
Number of groups	397	397
Number of instruments	54	66
AR1	0.009	0.020
AR2	0.295	0.397
Sargan	0.000	0.000
Hansen	0.051	0.175
Difference in Hansen	0.472	0.487

Notes: Robust standard errors in parentheses (***p < 0.01, **p < 0.05, *p < 0.1). Two-step system GMM estimation is applied in all regressions. Model (1) includes a dummy variable representing sectors that are export oriented. Model (2) includes a dummy variable representing interactions between exports and the linkages.

downstream sectors generates greater investment spillover only for export-oriented sectors which are their suppliers in upstream sectors. Domestic investment in those sectors may benefit from projects and contracts with FDI customers that encourage them to invest more.

5. Conclusions

This paper investigates the crowding effects of FDI on domestic private investment at the sector level in Vietnam. After applying two-step system GMM estimation to several dynamic balanced panel datasets, all regressions are seen to be valid, tested for the absence of second order autocorrelation (AR2) and for instrument validity (Sargan/Hansen test). Overall, we find that FDI crowds in domestic private investment, implying that in general, investment by the former increases that of the latter in the same sector. More specifically, an increase of foreign investment in a given sector both in the previous and the current year leads to more investment by local private

firms present in that sector.

We also confirm a negative impact from joint-venture and state-owned investment on domestic private investment. Moreover, we find evidence of FDI spillover effects that pass on to local investment through forward linkages. This means that domestic private investment in downstream sectors appears to be motivated by the presence of FDI suppliers in upstream sectors. Our results from the extended estimations also support the view that export-oriented domestic companies benefit more from FDI than domestic firms in other sectors. Being in an export-oriented sector does not encourage private local firms to increase their annual investment. However, an export-oriented sector that has strong links with FDI through vertical linkages appears to be more likely to invest than other sectors.

Bearing in mind general concerns about the effectiveness of FDI on the host economy, our results suggest that attracting FDI inflow is an effective way to boost investment by domestic firms at the sectoral level. Future government policy should therefore continue to make it a priority to attract more foreign investment into the economy, whether directly or by joint-venture investment. Strengthening the linkages with FDI through vertical channels also helps to boost domestic investment, especially in export-oriented sectors. However, there is still a need to encourage and support the domestic sector by investing effectively in order to compete better with foreign investment operating in the same sectors. Moreover, policies for attracting FDI inflows should also focus on areas where FDI not only creates a positive influence on domestic investment, but also enhances linkages and technology transfers as well as qualities of human capital such as skills, knowledge and know-how in order to boost domestic private investment.

Declaration of competing interest

The author agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare absence of conflicting interests with the funders.

Acknowledgements

The authors declare that there is no conflict of interest in this research.

APPENDIX

Table A1

VARIABLES	(1)	(2)
	Two-step GMM	One-step GMM
DP(t-1)	0.373*** (0.0741)	-0.109 (0.498)
DP(t-2)	-0.191 (0.126)	-0.477 (0.604)
Otherin	0.217*** (0.0256)	0.291** (0.130)
Otherin(t-1)	0.290*** (0.0275)	0.197 (0.146)
Otherin(t-2)	0.00471 (0.0214)	0.00443 (0.0775)
Sector sale	-0.00624 (0.00626)	0.0144 (0.0235)
Interest rate	-1314*** (280.0)	-2907** (1467)
GDP	0.00159*** (0.000336)	0.00327* (0.00179)
Year dummies	Yes	Yes
Constant	1793 (817)	3178 (964)
AR(1)	0.025	0.008
AR(2)	0.144	0.228
Sargan	0.000	0.000
Hansen	0.071	0.086
Observations	1588	1588
Number of groups	397	397

Notes: Robust standard errors in parentheses (**p < 0.01, *p < 0.05, *p < 0.1). Model (1) is the results from two-step system GMM estimation and model (2) is for one-step GMM. Otherin refers to all other investments including state-owned, foreign and joint venture investment.

References

- Aggarwal, R., Demirci-Kunt, A., Peria, M.S.M., 2011. Do remittances promote financial development? *J. Dev. Econ.* 96 (2), 255–264. <https://doi.org/10.1016/j.jdeveco.2010.10.005>.
- Agosin, M.R., Machado, R., 2005. Foreign investment in developing countries: does it crowd in domestic investment? *Oxf. Dev. Stud.* 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. *Proc. Soc. Behav. Sci.* 172, 419–426. <https://doi.org/10.1016/j.sbspro.2015.01.395>.
- Aitken, B.J., Harrison, A.E., 1999. Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *Am. Econ. Rev.* 89 (3), 605–618.
- Anwar, S., Nguyen, L.P., 2011. Foreign direct investment and export spillovers: evidence from Vietnam. *Int. Bus. Rev.* 20 (2), 177–193.
- Apergis, N., Katrakilidis, C.P., Tabakis, N.M., 2006. Dynamic linkages between FDI inflows and domestic investment: a panel cointegration approach. *Atl. Econ. J.* 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. *Rev. Econ. Stud.* 58 (2), 277–297.
- Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-components models. *J. Econom.* 68 (1), 29–51.
- Blomström, M., Kokko, A., 1998. Multinational corporations and spillovers. *J. Econ. Surv.* 12 (3), 247–277.
- Blomström, M., Kokko, A., Globerman, S., 2001. The determinants of host country spillovers from foreign direct investment: a review and synthesis of the literature. In: Pain, N. (Ed.), *Inward Investment Technological Change and Growth*. Springer, London, England, pp. 34–65.
- Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. *J. Econom.* 87 (1), 115–143.
- Chang, S.-C., 2005. The dynamic interactions among foreign direct investment, economic growth, exports and unemployment: evidence from Taiwan. *Econ. Change Restruct.* 38 (3–4), 235–256.
- Chen, G.S., Yao, Y., Malizard, J., 2017. Does foreign direct investment crowd in or crowd out private domestic investment in China? The effect of entry mode. *Econ. Modell.* 61, 409–419. <https://doi.org/10.1016/j.econmod.2016.11.005>.
- De Backer, K., Sleuwaegen, L., 2003. Does foreign direct investment crowd out domestic entrepreneurship? *Rev. Ind. Organ.* 22 (1), 67–84.
- De Mello, L.R., 1999. Foreign direct investment-led growth: evidence from time series and panel data. *Oxf. Econ. Pap.* 51 (1), 133–151.
- Deok-Ki Kim, D., Seo, J.-S., 2003. Does FDI inflow crowd out domestic investment in Korea? *J. Econ. Stud.* 30 (6), 605–622.
- Farla, K., De Crombrughe, D., Verspagen, B., 2016. Institutions, foreign direct investment, and domestic investment: crowding out or crowding in? *World Dev.* 88, 1–9.
- Fujimori, A., Sato, T., 2015. Productivity and technology diffusion in India: the spillover effects from foreign direct investment. *J. Pol. Model.* 37 (4), 630–651. Retrieved from: <http://www.sciencedirect.com/science/article/pii/S016189381500054X>.
- General Statistic Office, 2017. Vietnam economy-General report. Retrieved from: <https://www.gso.gov.vn/default.aspx?tabid=621&ItemID=16174>.
- Ha, V., Holmes, M.J., Hassan, G., 2020. Does foreign investment benefit the exporting activities of Vietnamese firms? *World Econ.* 43 (6), 1619–1646. <https://doi.org/10.1111/twec.12912>.
- Ipek, E., Kizilgöl, Ö.A., 2015. The contribution of FDI flows to domestic investment: an econometric analysis of developing countries. *Yonetim ve Ekonomi* 22 (2), 401.
- Jan Mišun, V.T., 2002. Does foreign direct investment crowd in or crowd out domestic investment? *E. Eur. Econ.* 40 (2), 38–56.
- Jansen, K., 1995. The macroeconomic effects of direct foreign investment: the case of Thailand. *World Dev.* 23 (2), 193–210.
- Javorcik, B., 2002. Does foreign direct investment increase the productivity of domestic firms: in search of spillovers through backward linkages. *Am. Econ. Rev.* 94 (3), 605–627.
- Javorcik, B., 2004. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *Am. Econ. Rev.* 94 (3), 605–627.
- Jude, C., 2012. Horizontal and Vertical Technology Spillovers from FDI in Eastern Europe. Retrieved from: <https://ideas.repec.org/p/leo/wpaper/710.html>.
- Kheng, V., Sun, S., Anwar, S., 2017. Foreign direct investment and human capital in developing countries: a panel data approach. *Econ. Change Restruct.* 50 (4), 341–365.
- Kokko, A., Thang, T.T., 2014. Foreign direct investment and the survival of domestic private firms in Viet Nam. *Asian Dev. Rev. Stud. Asian Pac. Econ. Issues* 31 (1), 53–91.
- Kosova, R., 2010. Do foreign firms crowd out domestic firms? Evidence from the Czech Republic. *Rev. Econ. Stat.* 92 (4), 861–881.
- Markusen, J.R., Venables, A.J., 1999. Foreign direct investment as a catalyst for industrial development. *Eur. Econ. Rev.* 43 (2), 335–356.
- Ministry of Industry and Trade, 2019. Export Potential Assessment. Retrieved from: <https://moit.gov.vn/tin-chi-tiet/-/chi-tiet/hoi-thao-quoc-gia-%C4%91anh-gia-tiem-nang-xuat-khau-103565-22.html>.
- Mišun, J., Tomšik, V., 2002. Foreign direct investment in central Europe: does it crowd in domestic investment? *Prague Econ. Pap.* 2002 (1).
- Morrissey, O., Udomkerdmongkol, M., 2012. Governance, private investment and foreign direct investment in developing countries. *World Dev.* 40 (3), 437–445. <https://doi.org/10.1016/j.worlddev.2011.07.004>.
- Morrissey, O., Udomkerdmongkol, M., 2016. Response to ‘institutions, foreign direct investment, and domestic investment: crowding out or crowding in?’ *World Dev.* 88, 10–11. <https://doi.org/10.1016/j.worlddev.2016.08.001>.
- Mullen, J.K., 2010. FDI and Domestic Capital Stock in US Manufacturing Industries: Crowding-Out and Displacement Effects. National University of Ireland, Galway. Paper presented at the Department of Economics. https://aran.library.nuigalway.ie/bitstream/handle/10379/1446/paper_0160.pdf?sequence=1.
- Navaretti, G.B., Venables, A., Barry, F., 2004. *Multinational Firms in the World Economy*. Princeton University Press, New Jersey, USA.
- Newman, C., Rand, J., Talbot, T., Tarp, F., 2015. Technology transfers, foreign investment and productivity spillovers. *Eur. Econ. Rev.* 76, 168–187. Retrieved from: <http://www.sciencedirect.com/science/article/pii/S0014292115000367>.
- Noorzooy, M., 1979. Flows of direct investment and their effects on investment in Canada. *Econ. Lett.* 2 (3), 257–261.
- Pham, H., 2016. Foreign Direct Investment, productivity and crowding-out: dynamic panel evidence on Vietnamese firms. In: Paper Presented at the Economics and Finance Conferences. https://www.gtap.agecon.purdue.edu/resources/res_display.asp?RecordID=4925.
- Pilbeam, K., Oboleviciute, N., 2012. Does foreign direct investment crowd in or crowd out domestic investment? Evidence from the European union. *J. Econ. Asymmetries* 9 (1), 89–104. <https://doi.org/10.1016/j.jeca.2012.01.005>.
- Rath, B.N., Bal, D.P., 2014. Do FDI and public investment crowd in or crowd out private domestic investment in India. *J. Develop. Area.* 48 (3), 269–284.
- Roodman, D., 2009. How to do xtabond2: an introduction to difference and system GMM in Stata. *STATA J.* 9 (1), 86–136.
- Vu, T.M., Yamada, H., Otsuki, T., 2017. Rise and fall of multinational enterprises in Vietnam: survival analysis using census data during 2000–2011. *Asian Econ. J.* 31 (1), 83–109.
- Wang, Y., 2013. Exposure to FDI and new plant survival: evidence in Canada. *Can. J. Econ.* 46 (1), 46–77.
- World Bank, 2017. Vietnam at a Crossroads-Engaging in the Next Generation of Global Value Chains. Retrieved from: <http://documents.worldbank.org/curated/en/808541488967692813/Vietnam-at-a-crossroads-engaging-in-the-next-generation-of-global-value-chains>.
- Wu, G., Sun, Y., Li, Z., 2012. The crowding-in and crowding-Out effects of FDI on domestic investment in the Yangtze delta region. *China Int. J.* 10 (2), 119–133.