

EFFECTS OF FOREIGN DIRECT INVESTMENT ON VIETNAM DOMESTIC FIRMS

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Abstract

FDI has been consider as one of the most important factors for domestic companies to grow in many developing countries. This paper will examine the impacts of FDI on productivity of manufacturing and non-manufacturing domestic companies in Vietnam by using panel micro-level firm data from 2010-2014. The data is withdrawn from enterprise survey which is conducted annually by General Statistics Office (GSO) Vietnam. Based on some recent research (Negara and Adam 2012; Chuang and Hsu 2004), the basic ideas of investigating the evidence of horizontal along with vertical effects is through examining a firm production which using a basic Coub-Douglas production function. The results show that FDI would trigger improvement of technology in the local firms the mainly through horizontal linkages whereas backward linkages have negative influence on local firm's productivity. Moreover, absorptive capacity seems to be a burden on firms. However, I believe that after the period of "disruptive technology", absorptive capacity would definitely be prominent precondition for improving productivity of local firms.

Introduction

FDI in Vietnam

Among ASEAN countries, Vietnam has experienced a dramatic increase in FDI inflows in recent years. Especially, after 20 years of implementing the first Law on Foreign Investment, the inflow of FDI to Vietnam achieved the highest record in 2008 with US\$71.7 billion of registered capital and US\$11.500 implemented capital (see Table 1). According to General Statistic Office, by the end of 2015, Vietnam has accumulated about US\$300 billion of total registered capital from 20150 FDI projects.

Year	Project	Registered capital (millions	Implemented capital
		USD)	(millions USD)
2005	970	6.840	3.300,5
2006	987	12.004,5	4.100,4
2007	1.544	21.348,8	8.034,1
2008	1.171	71.726,8	11.500,2
2009	1.208	23.107,5	10.000,5
2010	1.237	19.886,8	11.000,3
2011	1.186	15.598,1	11.000,1
2012	1.287	16.348	10.046,6
2013	1.530	22.352,2	11.500
2014	1.843	21.921,7	12.500
2015	2.120	24.115	14.500

Table 1. Total registered and implemented capital by year in Vietnam

Source: General Statistic Office of Vietnam (GSO Vietnam)

As showing in "Flying Geese Paradigm" which related to the dynamics of comparative advantage and the waves of industrialization in developing countries, Vietnam is considered as the new attractive destination for FDI flows. Due to advantages of location in a rapidly economic growing region as well as a high expectation of foreign investors after joining WTO in 2007, Vietnam has overtaken Philippines and Indonesia to become one of the largest recipients of FDI inflows in the ASEAN (Tran and Dinh, 2013). As results, the contribution of FDI to economic growth in Vietnam has increased over the years and accounted for around 5.5% of GDP in the period of 2010-2014. Particularly, in 2014, this contribution was 4.94% of GDP, reaching to US\$ 9,2 billion (see Figure 1)

The contribution of FDI can be presented clearly in the economic figures overtime. According to GSO Vietnam, FDI has created about 5 million jobs including 2 million direct jobs and 3 million indirect jobs, improved human resource quality as well as contributed to the transition of new technologies and experience from developed countries. It also has a strong impact on labor restructuring in Vietnam on the framework of labor towards industrialization – modernization. In addition, FDI inflows are also the main source in export proportions. It has facilitated Vietnam in enhancing export capacity which gradually improves Vietnam status in the global value chain. Especially, FDI investors affected the structure of export in the direction of decreasing the proportion of primary commodity, mineral product whereas increasing the percentage of the intensive-technology product.





Source: The World Bank

Drawbacks of attracting FDI in Vietnam

Although in recent years, Vietnam has become one of the most attracted destinations for FDI inflows, there is still some existing limitation related to FDI effects. In particular, the added value which is generated from FDI is low, the capability of Vietnam domestic firms in joining the global value chain seems to be limited, and the economic scale of FDI projects is still small, etc. Due to the advantage of young and cheap labor workforce, most of FDI inflows to Vietnam mainly focused on labor-

intensive sectors that do not create much added value for the own country (Nguyen and Nguyen, 2007).

Many FDI projects are small and medium sizes. Although the average registered capital in the period of 2010-2015 is quite large with over US\$ 23 billion, the real implemented capital is only US\$ 9 billion per year (see Table 1). Besides, more than 80% of FDI companies use world-average technology whereas only 5% using high-tech to invest in Vietnam. Therefore, the technology spillover effects seem to be limited.

As a typical host country to attract FDI inflows in South East Asia, the contradiction impacts of FDI on economic growth raises the question about the effects of foreign corporations' activities on Vietnam's local firm. This paper will focus on examining the impacts of FDI spillovers on the productivity of manufacturing and non-manufacturing firms in Vietnam by using firm micro-level data from 2010 to 2015. The main hypotheses will be tested in this study are:

H1: FDI has a positive impact on firm's productivity in both manufacturing and non-manufacturing sector

H2: The spillover effects in the manufacturing sector are more significant than in the non-manufacturing sector

Literature review

Empirical studies

In long period of time, there are several empirical studies to assess the effects of FDI inflows on domestic enterprises. It is noted that the analytical framework of these studies is relatively similar. However, there are few researches that have examined both vertical and horizontal spillover effects of FDI on local firms. In 1986, Blomstrom was one of the first researchers who attempted to investigate the spillover effects in developing countries. Then, a number of studies were conducted in different developing countries such as Aitken and Harrison (1999) in Venezuela, Fu (2008) in China and Crepo, Fontoura and Proenca (2009) in Portugal.

By employing data of manufacturing industries from 2000 to 2004 in Malaysia, Khalifah and Adam (2009) indicated that FDI has positive technology spillover effects on local firms in the same industry. He also noted that both foreign-owned and local-owned enterprises have insignificantly negative impacts on labor productivity. Similarly, Behera, Dua et al. (2012) also suggested that the technology spillovers "are relatively higher in industries like food products, textiles, chemicals, drugs and pharmaceuticals and nonmetallic mineral products" (Behera, Dua et al., 2012).

Interestingly, there are also some studies that failed to find the positive linkages between foreign presence and local firms' productivity. While studying three emerging economies including Bulgaria, Romania and Poland, Konings (2001) found an insignificant impact of FDI on high productive capacity of local firms. He suggested that restructuring may take time to appear on the indicator. Especially, Germidis (1977) also indicated the negative or insignificant spillover impacts associated with FDI when conducting research on 12 developing countries. One of the most common explanations for the contradictory results in above papers is the technology gap. Due to the constraint of labor capability and technology, the gap between foreign and local firms is too large so that domestic enterprises cannot benefit from the transition of the new technology from foreign firms. Another reason is the situation of losing market share of domestic firms because foreign cooperations have advantages of capital and technology. As result, local enterprises cannot be able to achieve productive scale and therefore reduce their productivity.

Horizontal and vertical effects

FDI can affect local firms in two ways: horizontal and vertical linkages. Horizontal effect includes demonstration, competition, labor turnover and export externalities whereas the vertical effect contains two opposite linkages (backward and forward) (Guide who is, 2011).

Demonstration occurs when new technology is brought to the host country and then, local firms will be able to observe and learn the techniques and skills which help to improve their productivity (Le, 2005). Saggi (2002) and Meyer (2004) explained that before foreign investors come to the host country, most of the domestic firms are lack of technological innovation. Therefore, after new technology is introduced, local firms can perceive techniques and skills which generate high productivity (Wang and Blomstrom, 1992).

Besides, in the context of globalization, local enterprises have no choice but operating more efficiently by adopting new technology in order to enhance their competitive capacity (Gorg and Strobl, 2001). However, foreign presence is also the main reason for the losing market situation of domestic enterprises in the host country (Aitken and Harrison, 1999).

While working for foreign enterprises, workers have a chance to learn advanced techniques and skills which later can start their own business or work for other local companies. Therefore, the movement of labor is also considered as an important channel for spillover (Gorg and Greenaway, 2004). There is a big threat to domestic companies by losing high-skilled worker to foreign ones because they can offer better work condition, high salary and stable career path.

Most studies about vertical linkage illustrated the significant impact of backward effects because it provides knowledge (Giroud, 2003) and involves intensive interaction between buyer and supplier. One of the main explanation for the less attention to forward effects is the less significant empirical study in comparison with backward effects.



Data and methodology

Data

This paper uses a micro-level firm panel data which is built from the sample of both manufacturing and non-manufacturing companies in Vietnam. The data is withdrawn from enterprise survey which is conducted annually by General Statistics Office (GSO) Vietnam. The survey contains all information of the total sales, revenues, number of employees, R&D, fixed asset, foreign share in total equity capital and others. After excluding enterprises with total sales which are smaller than \$250 and employees are less than 50, the number of observations is 45495.

Year	Horizontal		Backward		Forward	
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
2010	15.87233	17.30632	15.58588	16.57395	16.25636	17.88382
2011	16.57767	17.53944	16.4816	17.21963	16.91817	17.65316
2012	16.27917	17.9113	15.90995	16.91041	16.30118	17.25262
2013	15.8389	16.07906	15.55458	15.22728	15.9174	15.49671
2014	15.57021	15.06376	15.30931	14.33046	15.61707	14.56111
2015	14.43923	15.84859	14.18034	14.094867	14.1382	15.22157

Table 2. Statistical description of spillover variables

Methodology

Based on firm production, horizontal and vertical effects will be calculated. The equation of Coub-Douglas production function will be used in this paper (Chang, Chung and Xu, 2007):

 $\ln (Y_{it}/L_{it}) = \alpha + \beta_1 \ln(K_{it}/L_{it}) + \beta_2 \ln (M_{it}/L_{it}) + \beta_3 FS_{it} + \beta_4 Horizontal_{jt} + \beta_5 Backward_{jt} + \beta_6 Forward_{jt} + e_{it}$

 Y_{it} is total sale of firm *i* at time *t*, deflated by industry price index

K_{it} is capital input which measured by number of fixed assets

 L_{it} is number of employees at time t

M_{it} is raw material input

 FS_{it} is foreign shares in total firm capital

While horizontal effect is calculated as the ratio of foreign shares over total sale of each firm in industry *j*:

$$Horizontal_{jt} = \frac{\sum_{i:i \in j} FS_{it} \times Y_{it}}{\sum_{i:i \in j} Y_{it}}$$

Backward and forward linkages are computed as:

$$Backward_{jt} = \sum_{k \ if \ k \neq j} \gamma_{jk} \times Horizontal_{kt}$$

Forward_{jt} =
$$\sum_{m \ if \ m \neq j} \delta_{jm} \times Horizontal_{kt}$$

 γ_{jk} is ratio of industry j's output which is supplied to industry k

 δ_{jm} is share of inputs that firms in industry j purchase from industry m in total inputs sourced by sector j (Nguyen et al. 2013)

Empirical results and discussion

Fixed effect estimation is used to analyze the influence of FDI to local enterprises.

	Manufacturing		Non-manufacturing		
Variables	All firms	Domestic	All firms	Domestic	
Horizontal	0.0391**	0.0419**	-0.00831	-0.0197	
	(0.0106)	(0.0116)	(0.0604)	(0.0622)	
Backward	-0.0413**	-0.0446**	0.00577	0.0221	
	(0.0128)	(0.0138)	(0.0556)	(0.0584)	
Forward	-0.0176	-0.0176	-0.00736	-0.0101	
	(0.0942)	(0.0601)	(0.0958)	(0.0910)	
Observations	9,861	8,807	18,482	17,288	
R-squared	0.327	0.325	0.315	0.317	
Number of ID	5,452	4,908	8,083	7,500	
Number of year	6	6	6	6	
Note: Robust t statistics in parentheses		* significant at 5%; ** significant at 1%			

Table 3. Horizontal and vertical effects on domestic enterprises

The result indicates that the participation of foreign investment contributes to the growth of domestic enterprises' productivity. In the manufacturing sector, FDI has positive and significant horizontal effect on all firms as well as on domestic firms. For example, the coefficient of 0.0391 explains that if 1% of foreign share is added, the productivity will increase by 3.91% as a result of horizontal effect. Especially, it influences even larger on the productivity of domestic firms with coefficient of 0.0419. The result also shows some evidence of the negative effect of backward linkage on firm's productivity while the forward effect is insignificant.

The results suggest that domestic firms can get benefit from the participation of foreign investment through horizontal spillover. This phenomenon will be a force to push up domestic enterprises to improve their productivity and reduce its cost in order to compete and survive in the market. Besides, backward linkage has a negative effect on firm's productivity, it can be explained by the fact that domestic enterprises get difficulties in absorbing high technology due to the growing expenses of local providers.

In non-manufacturing sector, there is no significant coefficient to explain the relationship between FDI and domestic firm's productivity. One of the reasons for this result is investment forms. Since 2000, it seems that joint venture company is no longer attractive to the foreign investor but set up 100% foreign-owned enterprises. Moreover,



foreign investors establish the business in Vietnam to take advantage of incentives such as tax exemption, low labor cost, etc. Especially, in the non-manufacturing sector, they bring low effective and old technology which has no spillover effect on the domestic market.

Variables	(1)	(2)	(3)	(4)	(5)
valiables	Bac Ninh	HCM	Dong Nai	Binh Duong	Hanoi
Horizontal	0.155*	0.0276**	0.0326*	0.0364*	0.0403*
	(0.0445)	(0.0142)	(0.0268)	(0.0230)	(0.0290)
Backward	-0.112	-0.00851*	-0.00875*	-0.137*	-0.0500*
	(0.0825)	(0.0226)	(0.0381)	(0.0409)	(0.0355)
Forward	-0.0580	-0.0336*	-0.0452*	0.0869*	-0.0104*
	(0.0628)	(0.0132)	(0.0318)	(0.0328)	(0.0170)
Observations	255	6,079	760	914	4,981
R-squared	0.257	0.325	0.290	0.331	0.346
Number of ID	104	2,144	258	324	1,568
Note: Robust t statistics in parentheses * significant at 5%; ** significant at 19				ant at 1%	

Table 4. Spillover effect in different provinces in Vietnam

Table 4 shows the influence of FDI to five provinces where attract highest FDI flow in Vietnam, including Hanoi and Bac Ninh in the North and Ho Chi Minh, Dong Nai and Binh Duong in the South. The results report that FDI has a significant impact on firms' productivity in all five regions in Vietnam. For example, as the capital of Vietnam, Hanoi is one of the most attractive destinations for foreign investors, leading to the high spillover effect on domestic enterprises, with coefficient of horizontal effect is 0.04 which means that if investment increases 1%, the productivity will rise by 4%. However, these firms also get negative effects of forward and backward linkages because that most of investment projects here focus on real estate, finance, and banking. Ho Chi Minh city is also getting the same pattern as it is in Hanoi. Whereas the other three provinces are attractive destinations for manufacturing enterprises which relates to high technology transfer and new management skills to enhance productivity.

Variables	Manufacturing		Non-manufacturing		
	State-owned	Private Firms	State-owned	Private Firms	
	Firms		Firms		
Horizontal	-0.0106*	0.0642*	-0.0236*	0.00879*	
	(0.0187)	(0.0174)	(0.0224)	(0.0185)	
Backward	0.0129*	-0.0608	0.0402*	-0.0449*	
	(0.0204)	(0.0643)	(0.0268)	(0.0351)	
Forward	-0.0184**	-0.0263	-0.0205*	0.0210*	
	(0.0138)	(0.0917)	(0.0165)	(0.0228)	
Observations	0 116	12 802	10 777	16 104	
	9,110	12,803	12,777	10,104	
R-squared	0.283	0.335	0.231	0.215	
Number of ID	1,760	4,069	2,424	5,310	
Note: Robust t statistics in parentheses * significant at 5%; ** significant at 1%					

Table 5. Relationship between ownership structure and spillover effect

Examination of the connection between ownership structure and spillover effect. As expected, private companies receive the highest impact of FDI on productivity. It is related to the nature of private sector because, without subsidies and support from the government, private enterprises need to absorb new technology and attract more investment especially from foreign investors who can provide both technology and management skills. There is the same situation in the non-manufacturing sector. In state-owned firms, the results express evidence of the negative effect on productivity. For example, if investment increases by 1%, horizontal effect will decrease 1.06% and the forward linkage goes down 1.84%. It explains the mission to turn state-owned enterprises to joint stock companies under the direction of Vietnam government in order to make the firms to be more dynamic and competitive.

Conclusion

This paper explains the spillover effects of FDI to domestic firms in Vietnam based on firm-level data analysis. The main finding of this examination is that FDI flows influence productivity of domestic enterprises in different ways. First, there is a significant effect of FDI to firms in manufacturing sector whereas no clear evidence in the non-manufacturing sector. Second, the result also suggests that if local government wants to push up local firms, it is needed to establish policy in order to attract more FDI for the region. However, there is a concern of vertical effect which shows a negative impact on local firms.

In the trend of globalization, Vietnam government should implement the policy to attract foreign investors to bring high-technology to establish, transfer not only technology but also knowledge to operate high performance. Especially, negative vertical effects also suggest that domestic enterprises should consider carefully to provide inputs for foreign investors due to technology gap or capital shortage. Besides, while joining global value chain, the domestic enterprises need more supporting policy from the government to meet the requirement of the global competitive market.



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