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Potential market-stealing effect of FDI on state-owned enterprises: an empirical examination of the case of Vietnam

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Abstract

Despite significant contributions of foreign direct investment to the economies of the host countries, the market-stealing effect on the domestic enterprises could appear as international capital flow rises. Market-stealing effect could be negative to the domestic firms, including the state-owned enterprises (SOEs). For Vietnam, both foreign invested firms and SOEs are of interest to the government. The question of whether the market-stealing effect on SOEs appears as foreign direct investment increases needs to be answered. This study provides insights into the market-stealing effect from the market share and labor productivity perspectives using the random effects models with the panel data of more than 4,000 observations of SOEs in Vietnam. The market-stealing effect on SOEs in Vietnam is not found in either market share or labor productivity perspective in this analysis. From the aspect of market share, this effect is revealed in two important industries, which are agriculture, forestry and fishing (Industry A) and manufacturing (Industry C). In addition, the market-stealing effect is higher for the SOEs with 100% of state capital. From the labor productivity perspective in this analysis, this effect does not exist.

Keywords: Foreign direct investment, Market-stealing effect, State-owned enterprises, Vietnam

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1. Introduction

Foreign direct investment (FDI) is the international capital flow, which plays an important role in the capital accumulation process for host countries. For developing countries such as Vietnam, this type of capital has made a great contribution to its industrialization and modernization process. According to the United States Department of State (2020), Vietnam has attracted 143 billion USD in cumulative FDI over the period from 2010 to 2019. The government approved some significant FDI projects in 2019 such as the Beerco Limited's 3.9 billion USD acquisition of Vietnam Beverage, the Center of Techtronic Tools' project to develop a 650 million USD research and development center in Ho Chi Minh City, the Charmvit's 420 million USD for an amusement park and horse racing field in Hanoi, and the LG Display's 410 million USD expansion. During the period from 01 January 2021 to 20 November 2021, despite the difficulties faced due to the COVID-19 pandemic, Vietnam has still obtained 24.46 billion USD registered FDI and 17.1 billion USD has been implemented with 1,577 newly licensed projects (Figure 1). In the upcoming time, FDI value is expected to be higher as the Resolution 55 was issued and implemented. The Resolution 55 aims to attract 50 billion USD of FDI by 2030 by amending regulations that inhibit foreign investments and codifying quality, efficiency, advanced technology, and environmental protection criteria.

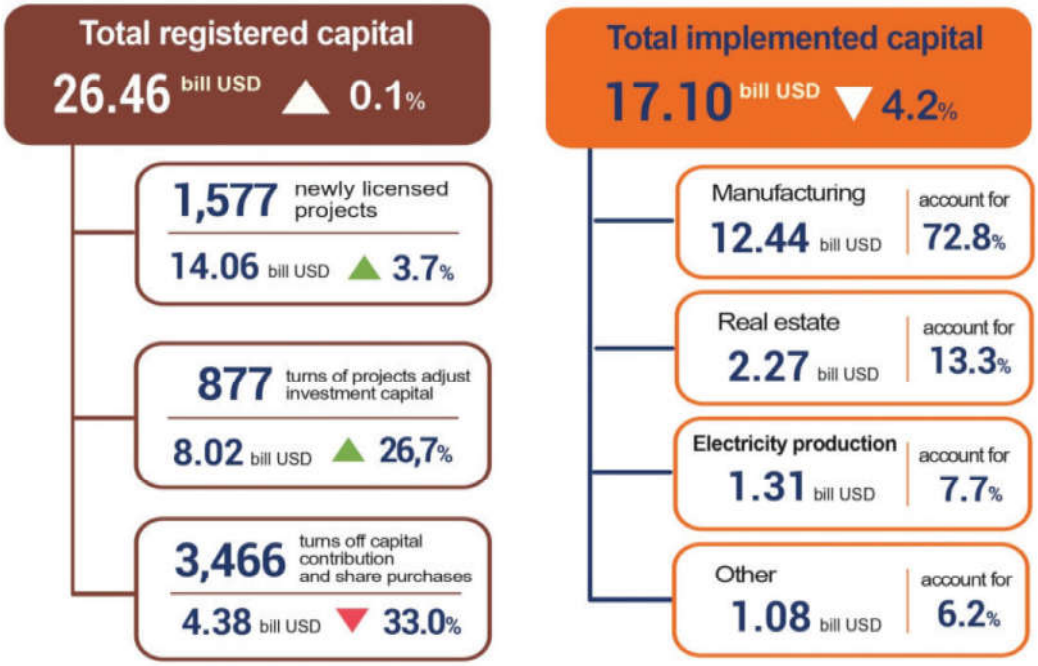

Figure 1. FDI inflows to Vietnam from 01 January 2021 to 20 November 2021

Source: General Statistics Office (2021b)

For the period from 2016 to 2020, manufacturing was the industry that attracted the highest amount of FDI, which was more than 91 billion USD (Figure 2). The second-ranked industry in FDI attraction was the real estate with more than 21 million USD. The power, gas, water, air conditioning, and the wholesale and retail, repair of vehicles industries had obtained a high value of FDI, which exceeded 10 million USD.

Unit: million USD

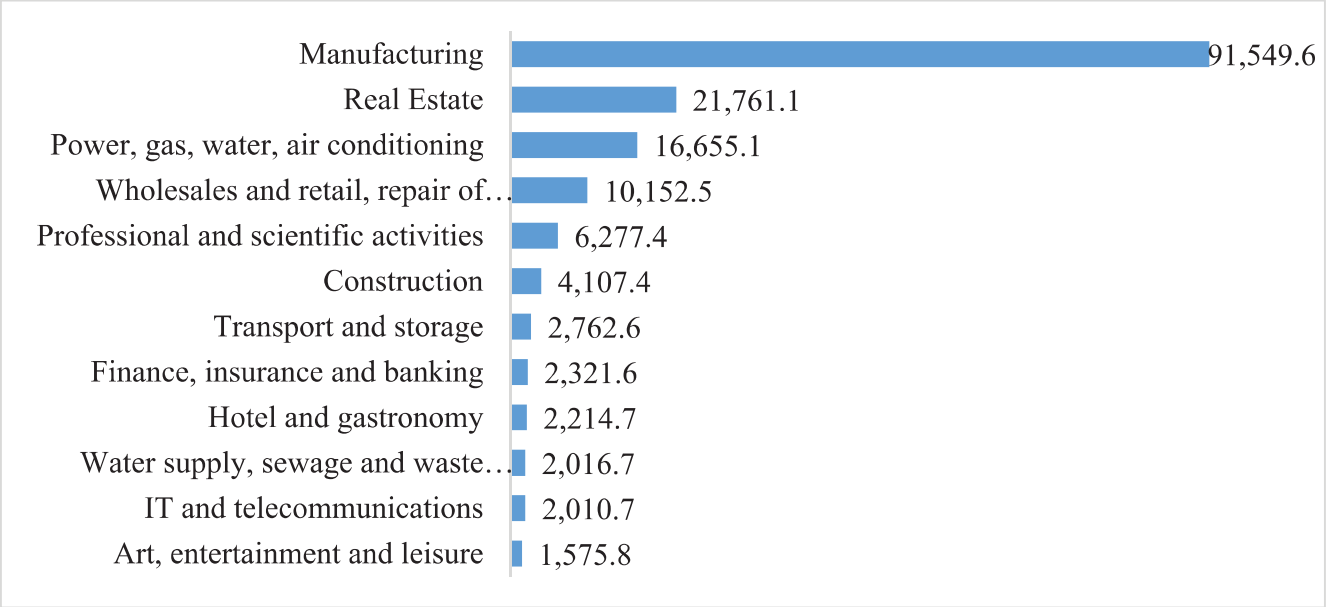

Figure 2. Leading industries in FDI inflow into Vietnam (by FDI value) from 2016 to 2020

Source: Statista (2021)

Despite the FDI's role in Vietnam's economy and the approval of the government for FDI projects, there have been many concerns about the possible negative effects of FDI on the local firms. One of those concerns is about the market-stealing effects of FDI on the state-owned enterprises (SOEs), which is an important pillar for the growth of developing countries.

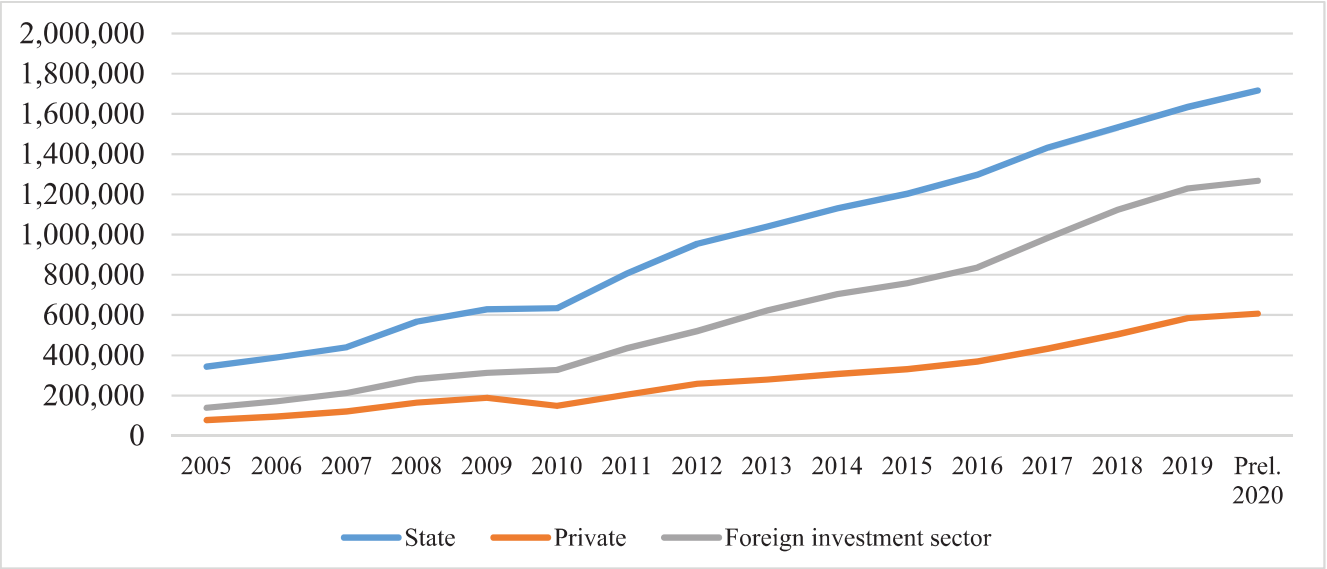

Figure 3. Gross domestic product at current prices by some types of ownership for the period from 2005 to 2020 in Vietnam

Source: General Statistics Office (2021a)

The SOEs are the enterprises in which the government or the state owns the majority of its capital. The SOEs hold important resources of the state and do business in key sectors of the economy. They have a competitive advantage over other enterprises. The SOEs are allowed to use land and natural resources, which provide them the opportunities to become monopolists in some sectors or/and the conditions to do business in some fields. Profit maximization, in many cases, is not necessarily required for the SOEs' operation. The activities of the SOEs are often based on the state's orientation for the purpose of providing public goods or services.

Figure 3 shows that both state and foreign invested sectors increasingly contributed to the country's GDP for a long period from 1995 to 2020. However, the foreign invested sector seems to have a faster growth than that of the state one, possibly thanks to the strong financial capacity, high technology, and other ownership advantages of FDI investors. The concern regarding the market-stealing effect of FDI on SOEs has risen as this phenomenon could negatively affect the economy of Vietnam.

According to Aitken and Harrison (1999), the market-stealing effect has been considered in a number of studies. Generally, this effect appears when there is a decrease in the productivity, output or market share of the domestically owned firms as foreign investment increases. Researchers only focused on the perspectives of either market share or labor productivity as proxies for the market-stealing effect and have not taken the SOEs into consideration. There has been no research about this effect on SOEs from the aspects of market share and labor productivity in Vietnam. To bridge the gap, we are going to analyze the market-stealing effect on SOEs in Vietnam from the market share and labor productivity perspectives as FDI increases.

The remaining of this paper is structured as follows. Section 2 demonstrates the concepts of SOEs and FDI. Section 3 refers to the literature review and theoretical background of the market-stealing effect of FDI. Section 4 and 5 present the empirical strategies and data. Section 6 covers the quantitative result of the market-stealing effect of FDI on SOEs. Section 7 concludes the paper.

2. State-owned enterprises and foreign direct investment

2.1 State-owned enterprises

There have been different definitions of SOEs. Vernon (1979) defines that SOEs from the international business perspective are tax collection agencies by producing and selling goods and services to the public, and they are expected to lead an industry's productivity growth. As a result, SOEs play a role in stimulating international trade by competing with foreign firms and raising the welfare of the other domestic firms in the same industry.

Meanwhile, the Organization for Economic Co-operation and Development - OECD (2009) defines SOEs as "business entities established by central and local governments, and whose supervisory officials are from the government." According to Rudy *et al.* (2016), the definition of OECD (2009) is based on the 100 percent SOEs. SOEs differ substantially from

privately owned enterprises (POEs) as SOEs pursue multiple goals such as economic and social objectives of the state and the profit objectives of the organization. That leads SOEs to behave differently from POEs.

In Vietnam, the views on the SOEs since 1990 have changed significantly. During the centrally planned economy, the SOEs are the enterprises that apply economic accounting according to the principle of planning, but not that of the market mechanism. From a legal perspective, the 1995 Law on State-owned enterprises of Vietnam defined that SOEs are the economic organizations that are invested by the state, established and managed by the state, conducting business or public-utility activities, in order to carry out socio-economic objectives assigned by the state (Article 1). Therefore, the SOEs are not necessarily wholly invested by the state. According to the 2005 Enterprise Law, "SOEs are enterprises in which the state owns more than 50% of the charter capital" (Clause 22, Article 4). However, the 2014 Enterprise Law defined "State-owned enterprises are enterprises in which 100% of charter capital is held by the state" (Clause 8, Article 4).

The change in the approach to the state's equity ratio stipulated in the legal documents shows that the state's policies have made many adjustments to adapt to the new situation, especially in accordance with the international commitments in the new generation of free trade agreements. According to Vietnam's 2020 Enterprise Law, "a SOE means an enterprise with more than 50% charter capital or voting shares of which is possessed by the state." SOEs shall be limited liability companies or joint stock companies, including: (i) wholly state-owned enterprises with 100% of charter capital invested by the state; (ii) partially state-owned enterprises with over 50% of charter capital or voting shares possessed by the state, except the wholly state-owned enterprises.

From all of these definitions, we could define SOEs as enterprises with a large part of capital belonging to the state. SOEs normally pursue two goals. According to Geddes (2008), the first goal of SOEs is profit. This goal is similar to that of POEs. The second one is the socioeconomic goal, which makes them different from POEs.

SOEs are often granted with advantages and preferential treatment to support them in fulfilling their responsibility claimed by the official authority (Tang Van *et al.*, 2016). Firstly, they obtain a soft budget constraint, meaning that they have a better opportunity to access capital even during financial downturns in comparison with POEs (Kornai, 1979). Secondly, among their shareholders, the government plays the role of long-term shareholders. For non-profit goals, SOEs could enjoy long-term investment set by their big shareholders, which are the government (Chang, 2007). As a result, SOEs could have the chances to invest in projects with high short-term risks and high long-term returns, which are not of interest to the private sectors due to its high riskiness. Thus, SOEs own a greater risk appetite than that of POEs. This is regarded as capital market failure by Chang (2007).

2.2 Foreign direct investment

FDI has also been defined in many ways by different organizations and provided in different laws of various countries. Among those, one of the most popularly accepted definitions has been provided by the International Monetary Fund - IMF (2004) in the Balance of Payment Manual, 5th edition in paragraph 359. According to the IMF (2004), "Direct investment is the category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy." What was clarified by the IMF regarding the objective of "establishing lasting interest" is about the wish to "ensure a significant degree of influence by the direct investor". In further clarification, the IMF indicated that in order to achieve that long-term relationship, the investors "own 10 percent or more of the ordinary shares or voting power (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise)." This definition has been mentioned in the Balance of Payment Manual, 5th edition to adopt the Detailed Benchmark Definition of Foreign Direct Investment (OECD, 2018).

From the above-mentioned definition, some main characteristics could be found (Vu, 2012). The most important goal for investment under the form of FDI is the financial benefits such as profit, but not social ones. Although some FDI investors seem to carry out more corporate social responsibility activities, their greatest interest is how much the financial benefit could be achieved, as they are private investors. FDI investors determine investment activities, amount of invested capital, sectors for investment, business strategy, human resource allocation, etc. The second feature that could be found from the definition is the lasting interest of FDI investors in the invested enterprises, meaning that investors aims to establish a long-term relationship, which is demonstrated by their effective voice in management. The next point should be stressed is that the possession of a controlling right, which is decided on the basis of voting power, is essential for FDI investors. As considered by the IMF and OECD, the way for investors to obtain this key right is the ownership of 10 percent or more of the ordinary shares or voting power for an incorporated enterprise or the equivalent for an unincorporated enterprise. Finally, FDI promotes technology transfer as investors bring new modern technologies from their home countries to the host ones. In addition to equipment and machines, which are regarded as the hardware part of technology, investors also make contributions to the technology transfer process as they share their knowledge and apply a variety of updated practices into the business operation.

3. Literature review and theoretical background of the market-stealing effect of FDI

Regarding the market-stealing effect of FDI, the literature review and theoretical background mainly focus on its impacts on domestic firms, including SOEs. There seems to be no separate theoretical background analyzing the impact of the market-stealing effect on SOEs. The number of studies on this topic from the perspectives of market share and labor productivity is limited.

The theoretical background of the market-stealing effect of FDI on domestic firms in the host countries has been originally explained in the study of Aitken and Harrison (1999).

According to them, the market-stealing effect could be considered to appear as there exists a decrease in the productivity, output or market share of domestically owned firms as foreign investment increases.

Due to the ownership of intellectual properties and strategic assets such as technological know-how, patents, intangible productive assets, broad business network, the multinational companies are considered to have the ownership advantages. With these advantages, they can compete with the domestic firms in the host countries. Hymer (1976) affirms that the productivity of these multinational corporations is higher than of domestic firms due to its superior production technologies and organizational techniques. Consequently, when faced with the fierce competition in the host countries' markets, the foreign firms with lower marginal costs will have an incentive in covering the fixed costs of production and, thus, can sell their products at lower prices. As a result, this will restrain the demand from domestic firms, leading to the reduction of the domestic firms' production and market share. Since the local firms have to cover their fixed costs over a smaller market, their productivity will fall.

Figure 4 illustrates the market-stealing effect from Aitken and Harrison (1999). The competition from foreign entrants forces the local plants to reduce their output along the average cost curve AC1 to the level of point B, despite the possibility of the positive spillover effect that helps domestic firms to reduce their average cost, shifting from AC0 to AC1. Hence, at the new equilibrium, the quantity supplied by domestic firms goes down.

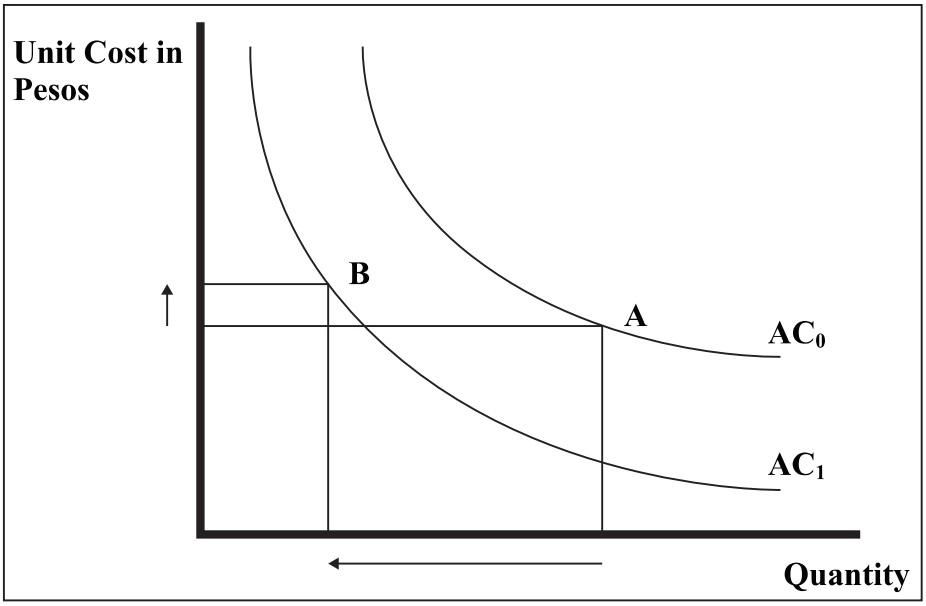

Figure 4. Output response of domestic firms to foreign entrants

Source: Aitken and Harrison (1999)

Following Aitken and Harrison (1999), Hu and Jefferson (2002) analyzed a rich set of data from 1995 to 1999 of the large- and medium-sized companies in the Chinese electronics and textile industries, provided by the Chinese National Statistical Bureau. They found the negative and statistically significant spillover effects of FDI on productivity and market share

of domestic firms in the textile industry in China. This result is consistent with the market-stealing explanation offered by Aitken and Harrison (1999). Using the 1994-2001 firm-level Czech data, Kosova (2010) reinforces the finding that the market-stealing effect appears as the presence of foreign firms significantly affects the growth and even the survival of domestic firms in the short run. According to Caves (1996) and Blomstrom *et al.* (2000), the likelihood that the entrance of multinational companies will crowd out local firms is larger in developing countries than in developed countries. The reason is that the technology gap between domestic and foreign firms in developing countries is normally larger than in developed ones. Lin and Kwan (2016) mention that the potential spillover effects such as the market-stealing effect had not achieved much attention from researchers despite its possible importance in the case of the Chinese firms. Choi (2018) analyzes the impact of the foreign investment on the sales of domestic firms using the 2006-2013 Korean firm-level data and shows that the market-stealing effect was more severe for small firms. Foreign firms does drive small domestic firms out from the domestic market and take away domestic market shares.

There have been some studies about the market-stealing effect of FDI on domestic firms in Vietnam. In a study regarding technological spillovers from FDI using firm-level data across 29 sectors for two different periods of 1995-1999 and 2000-2002, Le (2005) finds the evidence of weaker spillovers from FDI on the productivity of domestic industries in Vietnam over the later period. The market-stealing effect of the FDI on the domestic firms is due to the fact that there may be more competition created by FDI. However, this effect may only be contemporary. The spillover effects may turn positive if the domestic sectors develop well enough to be able to compete with the foreign sector and take advantage of the advanced technologies, know-how, and skills introduced through the FDI. Hoang and Pham (2010) examine the productivity spillover effect of FDI inflow in Vietnam during the period from 2003 to 2007. They estimate the factors and spillover effects of the FDI on the productivity of the domestic companies. They find that the presence of foreign multinationals is substantially positive for the domestic sector, and contributes to the productivity improvement of the local firms. This finding suggests that there is no market-stealing effect on the local firms. Pham (2016) uses a rich dataset of more than 160,000 Vietnamese firms across 28 industries and finds the market-stealing effect of FDI. The domestically owned enterprises lose their market share to their foreign-owned competitors when they compete directly with each other. According to Le *et al.* (2019), FDI has a positive effect on labor productivity in the long-term, which could mean that FDI has no market-stealing effect on the domestic firms. This study assesses the data for a long period from 1986 to 2014 using the methodology of the autoregressive distributed lag model by Pesaran *et al.* (2001) and the Granger causality test with the method of Toda and Yamamoto (1995). Nguyen *et al.* (2020) look into a sample of 537,772 Vietnamese enterprises from 2007 to 2015 and use the generalized methods of moments to examine the spillover effects of FDI on firm productivity. They find that the presence of the foreign entities negatively affects the productivity of the local firms. As Vietnam is still in the stage of attracting FDI, it requires more time for the domestic firms to learn and obtain benefits from this capital flow.

Despite a wide range of studies about the market-stealing effect of FDI on domestic firms, there is limited research about this impact on SOEs. There has been no research about the market-stealing effect of FDI on SOEs in Vietnam in terms of market share and labor productivity.

4. Empirical strategies

For the purpose of clarifying the market-stealing effect of FDI on SOEs in Vietnam, we constructed our models with the dependent variables to be either the market share or the labor productivity of SOEs in Vietnam. Regarding the independent variables, we include the proxies of the number of foreign invested enterprises and the value of FDI by industries. We follow this idea of specification to adopt the measure of the presence of foreign ownership in the industry from Aitken and Harrison (1999).

For controlling firms' basic characteristics, we use capital intensity, age and size, which are normally included in the literature. We also include the dummies of province, sector and year for controlling the heterogeneity of firms across provinces, sectors and years.

$$Mkt_{ikt} = \alpha_1 NuFIE_{kt} \text{ (or } LnFIE_{kt}) + \alpha_2 Capital\_int_{ikt} + \alpha_3 Ln\_em_{ikt} + \alpha_4 Ln\_age_{ikt} + \theta + \in_{ikt} \quad (1)$$

$$Lnlaborpro_{ikt} = \alpha_1 NuFIE_{kt} \text{ (or } LnFIE_{kt}) + \alpha_2 Capital\_int_{ikt} + \alpha_3 Ln\_em_{ikt} + \alpha_4 Ln\_age_{ikt} + \theta + \in_{ikt} \quad (2)$$

where i denotes the firm (or SOE i); k denotes the industry; t denotes the year; Mkt stands for the market share that is the ratio of the sales revenue of firm i from industry k and the sales revenue of industry k; Lnlaborpro denotes the natural logarithm of the labor productivity measured by the ratio of the sales revenue of firm i from industry k and the total number of labor of firm i working for industry k.

Regarding the independent variables, NUFIE denotes the number of foreign invested enterprises; LnFIE denotes the natural logarithm of the value of FDI invested in the industry; Capital_int stands for the capital intensity of the firm calculated by taking the ratio of the value of fixed assets and the number of labor of the firm; Ln_em presents the natural logarithm of the total number of employees; Ln_age denotes the number of years in operation; $\in$ is the error term; Θ includes dummies of industry, province and year.

The interested coefficient is α_1, which shows whether the market-stealing effect of FDI on SOEs in Vietnam occurs or not.

As the panel data is expected to be used and given a short time period, we apply the random effects models (REM) for the above-mentioned two models so that not just the within-firm, but the between-firm effects could be considered.

5. Data

The sample used in this research consists of 4,146 observations of SOEs in 2017 and 2018 with more than 2,300 SOEs. The data have been taken from the annual enterprises surveys in Vietnam, which have been carried out by the General Statistics Office (GSO). These SOEs

are distributed across approximately 18 industries with the first level of VSIC 2007 with five digits, according to the Vietnam Standard Industrial Classification 2007.

Table 1 provides information about summary statistics of the variables (see Appendix 1 for the correlation among variables). The mean of Mkt, which measures the market share of SOE in a specific industry, is small, which reflects the fact that the contribution of sales revenue from SOEs is not high. However, the mean of Lnlaborpro is higher. Both proxies are used to check the market-steal effects and make the expected results more reliable.

Table 1. Summary statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Mkt	4,146	0.0019852	1.71E-02	1.32E-10	0.938542
Lnlaborpro	4,146	6.540524	1.651581	-2.19723	14.73772
NuFIE	4,146	2027.103	3040.446	0	8270
LnFIE	4,145	15.3246	2.030889	10.13986	18.28505
Capital_int	4,146	1863.801	7487.966	0	213306.5
Ln_emp	4,146	4.954933	1.447544	0	10.83899
Ln_age	4,146	2.664506	0.761755	0	4.29046

Source: The authors' calculation

6. Results

6.1 Baseline results of the market-stealing effect of FDI on SOEs

Table 2 shows the results of the market-stealing effect on SOEs in Vietnam as FDI increases with 4,146 observations from more than 2,300 SOEs in Vietnam in 2017 and 2018. The results are based on the REM with panel data.

From Table 2, the market-stealing effect of FDI on SOEs in Vietnam is not detected. For both cases with Mkt and Lnlaborpro as dependent variables, we find statistically insignificant coefficients for NuFIE, which is the number of foreign invested enterprises in an industry that the SOE operates, in Columns (1) and (3). For the case of LnFIE, which is the value of FDI in an industry that the SOE operates, we find statistically significant and positive coefficients, meaning that higher FDI leads to higher labor productivity of the SOEs. In particular, as FDI inflow to an industry increases by 1%, labor productivity of the SOE rises by 0.033%.

From these findings for the whole sample of SOEs in all industries, the effect of FDI value is detected on the SOEs' labor productivity. However, this effect is not negative as suggested by the market-stealing effect. This finding indicates that the rise in FDI value encourages the SOEs to raise their productivity in different ways. According to the White Book 2020 issued by the Ministry of Planning and Investment for the period from 2016 to 2018, the average growth rate of net revenue of the SOEs is 9.9% in comparison with the period of 2011-2015. That growth of the FDI is 91.3%. The value of return on assets of the SOEs in 2008 is 2%

and that of the FDI is 5.8%. The difference in those numbers makes it essential for the SOEs to find a way to raise their productivity to compete with the FDI firms. Regarding the effects of other controlled variables, the impacts are consistent as NuFIE and LnFIE are used. About capital intensity, the statistical significance is at the high level of 1%. Positive coefficients in all cases indicate that as the SOEs possess a higher capital intensity ratio, they could have higher market share and labor productivity.

Table 2. Result of the market-stealing effect of FDI on SOEs in Vietnam

Variables	Mkt		Lnlaborpro	
	(1)	(2)	(3)	(4)
NuFIE	2.50e-07		-6.50e-05	
	(5.00e-07)		(0.000186)	
LnFIE		-9.56e-06		0.0333*
		(4.75e-05)		(0.0177)
Capital_int	3.21e-08***	3.22e-08***	2.48e-05***	2.48e-05***
	(8.25e-09)	(8.26e-09)	(2.58e-06)	(2.58e-06)
Ln_emp	0.000638***	0.000641***	-0.0613***	-0.0618***
	(8.17e-05)	(8.15e-05)	(0.0188)	(0.0188)
Ln_age	0.000105	0.000102	0.0151	0.0146
	(0.000204)	(0.000204)	(0.0376)	(0.0376)
Observations	4,146	4,145	4,146	4,145
Number of id	2,344	2,344	2,344	2,344
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample. Industry, year, and province dummies are included.

Source: The authors' calculation

There exist opposite effects of firm size on market size and labor productivity of the SOEs. While larger firm size raises the SOEs' market share, it leads to reduction in labor productivity. Normally, SOEs pursue two main goals, including financial and socioeconomic ones. The larger firm size of the SOEs could be a signal for a more important socioeconomic role, which is required by the government. As a result, they could obtain better financial support from the government and have more opportunities to raise their market share in a specific industry. However, as the firm size rises without an equivalent growth rate of revenues, it will lead to

a reduction in the labor productivity of those SOEs. The age of the SOEs has no significant effects on both market size and labor productivity.

6.2 Further results of the market-stealing effect of FDI on SOEs

6.2.1 Results of market-stealing effect by some key industries

The SOEs in the sample are distributed across 18 industries according to the VSIC (2007). However, we discover the existence of the market-stealing of the FDI on SOEs in Vietnam for five key industries, which are agriculture, forestry and fishing (Industry A); manufacturing (Industry C); construction (Industry F); wholesale and retail trade; repair of motor vehicles and motorcycles (Industry G); professional, scientific and technical activities (Industry M). Industries A, C, F, and G are selected as they are the top four industries with the highest number of SOEs as shown in Appendix 2. Industry M is included as it is among three industries that have the highest number of FDI enterprises together with Industries C and G. Appendix 3 presents the list of those three industries.

Table 3. Result of the market-stealing effect of FDI on SOEs in Vietnam by some key industries by market share

Variables	Mkt				
	(1)	(2)	(3)	(4)	(5)
NuFIE	-1.34e-05**	-4.21e-08***	-3.28e-07	7.58e-09	-1.79e-06
	(5.22e-06)	(1.55e-08)	(4.18e-07)	(1.42e-07)	(1.21e-06)
Capital_int	4.27e-08***	2.77e-08***	9.02e-08	8.37e-10	4.95e-08***
	(9.86e-09)	(4.53e-09)	(5.58e-08)	(6.69e-09)	(1.60e-08)
Ln_emp	0.000318***	7.17e-05***	0.000132***	1.30e-05	0.000784***
	(6.22e-05)	(1.54e-05)	(4.42e-05)	(1.59e-05)	(0.000254)
Ln_age	0.000292**	3.61e-07	5.14e-05	0.000165**	-0.000167
	(0.000145)	(2.94e-05)	(9.17e-05)	(7.89e-05)	(0.000555)
Observations	621	781	359	558	137
Number of id	343	442	220	324	80
Industry	A	C	F	G	M
Year	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample; Industries: A - Agriculture, forestry and fishing; C - Manufacturing; F - Construction; G - Wholesale and retail trade; repair of motor vehicles and motorcycles; M - Professional, scientific and technical activities. Year and province dummies are included.

Source: The authors' calculation

Tables 3 and 4 present different results regarding the existence of the market-stealing effect of FDI on SOEs from the perspectives of market share and labor productivity. Regarding the market share from Table 3, the increase in the number of foreign invested enterprises significantly reduces the market share of the SOEs in two industries of agriculture, forestry and fishing (Industry A) and manufacturing (Industry C). The higher magnitude of the coefficient for Industry C shows that the impact of FDI on SOEs in the manufacturing industry is larger than that in the agriculture, forestry and fishing industry. The results are also consistent as the variable of LnFIE is used (Appendix 5). For the other industries, in spite of being statistical insignificance, the coefficients are negative. These findings capture the negative effects of the increase in the number of foreign invested enterprises on market share of the SOEs in those industries.

Looking into the manufacturing industry in Figure 2, it has been the leading one in attracting FDI with more than 91 billion USD for the period from 2016 to 2020. As a result, the SOEs operating in this industry seem to face fierce competition with foreign invested enterprises in comparison with the SOEs in other industries.

About labor productivity, the results from Table 4 support the argument that the FDI raises labor productivity of the SOEs in all key industries. Even when capital intensity is controlled for, the effects of the number of foreign invested enterprises are statistically significant for almost all cases. The outcomes obtained as the independent variable changes to LnFIE (Appendix 6) are consistent with what has been achieved from Table 4.

In the agriculture, forestry and fishing (Industry A) and manufacturing (Industry C), the FDI does lead to the reduction of the market share of the SOEs. However, it helps these firms to raise their labor productivity. That means the market-stealing effect occurs for these two industries from the perspective of market share, but not from labor productivity perspective. In contrast, for the construction (Industry F), wholesale and retail trade; repair of motor vehicles and motorcycles (Industry G), and professional, scientific and technical activities (Industry M), the market-stealing effect does not occur and the labor productivity of the SOEs operating in these industries even rises when the number of foreign invested enterprises and the value of FDI invested in these industries go up.

Table 4. Results of the market-stealing effect of FDI on SOEs in Vietnam by some key industries by labor productivity

Variables	Lnlaborpro				
	(1)	(2)	(3)	(4)	(5)
NuFIE	0.0508***	0.000767***	0.0103***	0.00391***	0.00317***
	(0.00407)	(4.14e-05)	(0.000567)	(0.000251)	(0.000472)
Capital_int	5.17e-05***	-7.48e-06	0.000155**	0.000131***	1.62e-05***
	(7.55e-06)	(1.52e-05)	(7.73e-05)	(3.45e-05)	(6.23e-06)
Ln_emp	-0.310***	0.175***	-0.258***	-0.191***	0.0379
	(0.0483)	(0.0440)	(0.0606)	(0.0638)	(0.0988)
Ln_age	-0.0350	-0.257***	0.0931	0.352**	0.332
	(0.113)	(0.0769)	(0.125)	(0.152)	(0.217)
Observations	621	781	359	558	137
Number of id	343	442	220	324	80
Industry	A	C	F	G	M
Year	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample; Industries: A - Agriculture, forestry and fishing; C - Manufacturing; F - Construction; G -Wholesale and retail trade; repair of motor vehicles and motorcycles; M - Professional, scientific and technical activities. Year and province dummies are included.

Source: The authors' calculation

6.2.2 Results of market-stealing effect by types of SOEs

For further discovery about whether the market-stealing effect of FDI on SOEs could be subjected to types of the SOEs, the estimations have been carried out for main types of the SOEs with a large number of SOEs categorized in the survey data. These include one-member limited liability enterprises having 100% central/local state capital (type 1&2) and joint stock or limited liability enterprises having more than 50% of capital to be state one (type 3). Appendix 4 presents the number of observations by types of state-owned enterprises in the sample.

From the market share perspective, Table 5 shows that as the number of foreign invested enterprises or the value of FDI invested in a certain industry increases, the market share of the SOEs reduces for both one-member limited liability enterprises having 100% central/local state capital and joint stock or limited liability enterprises with more than 50% of state capital. The effects on the 100% state capital SOEs are higher than that on the SOEs with less state

capital, meaning that the stealing effect of the FDI on SOEs is more prominent for the SOEs with higher percentages of state capital.

Table 5. Result of the market-stealing effect of FDI on SOEs in Vietnam by types of SOEs by market share

Variables	Mkt			
	(1)	(2)	(3)	(4)
NuFIE	-4.09e-07***	-2.71e-07**		
	(1.14e-07)	(1.38e-07)		
LnFIE			-0.000306***	-9.09e-05***
			(0.000107)	(2.44e-05)
Capital_int	3.13e-08*	2.44e-08	3.53e-08**	1.37e-08**
	(1.75e-08)	(6.69e-08)	(1.76e-08)	(6.40e-09)
Ln_emp	0.00117***	0.000920***	0.00116***	0.000282***
	(0.000191)	(0.000330)	(0.000191)	(5.64e-05)
Ln_age	0.000598	-0.00141**	0.000584	2.85e-05
	(0.000498)	(0.000600)	(0.000499)	(0.000143)
Observations	1,552	2,295	1,552	2,294
Number of id	907	1,324	907	1,324
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
SOEtype	1 &2	3	1 &2	3

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample. SOE type 1: one-member limited liability enterprise having 100% central state capital; type 2: one-member limited liability enterprise having 100% local state capital; type 3: joint stock or limited liability enterprise having more than 50% capital to be state one. Industry, year, and province dummies are included.

Source: The authors' calculation

Regarding labor productivity, on the contrary with the effect on market share, the rise in the number of foreign invested enterprises and the value of FDI significantly helps to increase labor productivity of joint stock and limited liability enterprises that have more than 50% of the capital invested by the state. The impact of FDI on SOEs with less state capital is higher.

Table 6. Results of the market-stealing effect of FDI on SOEs in Vietnam by types of SOEs by labor productivity

Variables	Lnlaborpro			
	(1)	(2)	(3)	(4)
NuFIE	2.78e-05	4.39e-05***		
	(1.93e-05)	(1.28e-05)		
LnFIE			0.0881***	0.117***
			(0.0226)	(0.0146)
Capital_int	2.94e-05***	2.37e-05***	2.87e-05***	2.40e-05***
	(3.86e-06)	(4.29e-06)	(3.86e-06)	(4.27e-06)
Ln_emp	-0.0619*	-0.138***	-0.0582*	-0.118***
	(0.0338)	(0.0280)	(0.0335)	(0.0272)
Ln_age	0.0539	0.0632	0.0525	0.0456
	(0.0749)	(0.0562)	(0.0740)	(0.0547)
Observations	1,552	2,295	1,552	2,294
Number of id	907	1,324	907	1,324
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes
SOEtype	1 &2	3	1 &2	3

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample. SOE type 1: one-member limited liability enterprise having 100% central state capital; type 2: one-member limited liability enterprise having 100% local state capital; type 3: joint stock or limited liability enterprise having more than 50% capital to be state one. Industry, year, and province dummies are included.

Source: The authors' calculation

7. Conclusion

Employing the firm-level data from the GSO with more than 4,000 observations from more than 2,000 SOEs in Vietnam from 2017 to 2018 and applying the REM for panel data, this study presents interesting results. Firstly, there has been no evidence of the market-stealing effect of FDI on SOEs in Vietnam from the perspectives of market share and labor productivity. The advances in technological level with strong financial capacity and specific ownership advantages of FDI do help to spread the positive effects on the labor productivity of the SOEs in general. Meanwhile, as the SOEs possess certain privileges and/or operate in special or monopoly industries, their market shares have not been negatively affected by FDI. Secondly, the market-

stealing effect from the aspect of market share just occurs in two important industries, which are agriculture, forestry and fishing (Industry A) and manufacturing (Industry C). The entry of the FDI leads to the reduction in the market share of the SOEs. The effect is more significant in the manufacturing industry than in the agriculture, forestry and fishing industry. This finding is reasonable as the manufacturing industry has obtained a high level of FDI. Finally, by considering the types of SOEs and market share perspective, it is seen that, the market-stealing effect is higher for the SOEs with 100% of state capital. For the SOEs with higher percentages of state capital, it is more possible that their market shares are affected as FDI increases. From the achieved results, we suggest that the SOEs should be more adaptive to changes of the business to avoid the negative market-stealing effect from FDI inflows. Particularly for manufacturing and agriculture, forestry and fishing industries, SOEs need to consider different ways to be able to compete with foreign directed enterprises such as applying high-quality technologies, doing more training for improving their labors' skills, etc. In addition, from the viewpoint of the government, policy changes with regard to strengthening the competitiveness of SOEs need to be recognized clearly.

Despite the fact that the evidence for policy implications has been obtained, our study still faces some certain limitations regarding the data availability. Although we have taken the advantages of a rich set of SOEs data in Vietnam, the data range only from 2017 to 2018. Due to the short time-series, we have not made good use of the methods for panel data. Moreover, the current situation, such as the COVID-19 pandemic, has not been taken into consideration.

As a result, we suggest that further research should consider other factors such as the appearance and impacts of the COVID-19 pandemic. Moreover, with the data for longer time, it will be better to apply other methods for panel data.

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Appendices

Appendix 1. Correlations among variables

	Mkt	Lnlaborpro	NuFIE	LnFIE	capita~	Ln_emp	Ln_age
Mkt	1						
Lnlaborpro	0.2359	1					
NuFIEindus~y	-0.1115	0.0961	1				
LnFIE	-0.1117	0.2518	0.7761	1			
Capital_int	0.0905	0.1803	-0.0354	-0.0212	1		
Ln_emp	0.2582	0.076	0.1169	0.0291	-0.0099	1	
Ln_age	0.045	-0.0305	0.0816	0.064	-0.0967	0.1953	1

Source: The authors' calculation

Appendix 2. List of industries in the sample (classified by VSIC 2007)

Industry	Freq.	Percent	Cum.
A	621	14.98	14.98
B	136	3.28	18.26
C	781	18.84	37.10
D	155	3.74	40.83
E	326	7.86	48.70
F	359	8.66	57.36
G	558	13.46	70.82
H	320	7.72	78.53
I	175	4.22	82.75
J	104	2.51	85.26
K	48	1.16	86.42
L	171	4.12	90.55
M	137	3.30	93.85
N	93	2.24	96.09
O	1	0.02	96.12
P	12	0.29	96.41
Q	5	0.12	96.53
R	137	3.30	99.83
S	7	0.17	100.00
Total	**4,146**	**100.00**	

Notes: The provision on the contents of each economic industry of VSIC 2007 was issued by the Minister of the Ministry of Planning and Investment at the Decision No. 337/2007/QD-BKH on 10 April 2007.

Source: The authors' calculation

Appendix 3. Three industries having the highest number of foreign invested enterprises in the sample

Industry	Freq.	Percent	Cum.
C	781	52.91	52.91
G	558	37.80	90.72
M	137	9.28	100.00
Total	**1,476**	**100.00**	

Source: The authors' calculation

Appendix 4. Types of state-owned enterprises in the sample

SOE type	Freq.	Percent	Cum.
1	708	17.08	17.08
2	844	20.36	37.43
3	2,295	55.35	92.79
4	299	7.21	100.00

Notes: 1 - One-member limited liability enterprise having 100% central state capital; 2 - One-member limited liability enterprise having 100% local state capital; 3 - Joint stock or limited liability enterprise having more than 50% capital to be state one; 4 - State enterprise.

Source: The authors' calculation

Appendix 5. Further result of the market-stealing effect of FDI on SOEs in Vietnam by some key industries by market share

Variables	Mkt				
	(1)	(2)	(3)	(4)	
LnFIE	-0.000117**	-1.88e-05***	-1.59e-05	9.05e-07	-0.000189
	(4.57e-05)	(6.95e-06)	(2.03e-05)	(1.70e-05)	(0.000128)
Capital_int	4.27e-08***	2.77e-08***	9.02e-08	8.37e-10	4.95e-08***
	(9.86e-09)	(4.53e-09)	(5.58e-08)	(6.69e-09)	(1.60e-08)
Ln_emp	0.000318***	7.17e-05***	0.000132***	1.30e-05	0.000784***
	(6.22e-05)	(1.54e-05)	(4.42e-05)	(1.59e-05)	(0.000254)
Ln_age	0.000292**	3.61e-07	5.14e-05	0.000165**	-0.000167
	(0.000145)	(2.94e-05)	(9.17e-05)	(7.89e-05)	(0.000555)
Observations	621	781	359	558	137
Number of id	343	442	220	324	80
Industry	A	C	F	G	M
Year	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample; Industries: A - Agriculture, forestry and fishing; C - Manufacturing; F - Construction; G - Wholesale and retail trade; repair of motor vehicles and motorcycles; M - Professional, scientific and technical activities. Year, province dummies are included.

Source: The authors' calculation

Appendix 6. Further result of the market-stealing effect of FDI on SOEs in Vietnam by some key industries by labor productivity

Variables	Lnlaborpro				
	(1)	(2)	(3)	(4)	
LnFIE	0.445***	0.343***	0.498***	0.467***	0.335***
	(0.0356)	(0.0185)	(0.0275)	(0.0300)	(0.0499)
Capital_int	5.17e-05***	-7.48e-06	0.000155**	0.000131***	1.62e-05***
	(7.55e-06)	(1.52e-05)	(7.73e-05)	(3.45e-05)	(6.23e-06)
Ln_emp	-0.310***	0.175***	-0.258***	-0.191***	0.0379
	(0.0483)	(0.0440)	(0.0606)	(0.0638)	(0.0988)
Ln_age	-0.0350	-0.257***	0.0931	0.352**	0.332
	(0.113)	(0.0769)	(0.125)	(0.152)	(0.217)
Observations	621	781	359	558	137
Number of id	343	442	220	324	80
Industry	A	C	F	G	M
Year	Yes	Yes	Yes	Yes	Yes
Province	Yes	Yes	Yes	Yes	Yes

Notes: *, **, and *** denote the level of significance at 10%, 5%, and 1%, respectively. The REM for panel data has been applied. Number of id is the identification number of SOEs considered in the sample; Industries: A - Agriculture, forestry and fishing; C - Manufacturing; F - Construction; G - Wholesale and retail trade; repair of motor vehicles and motorcycles; M - Professional, scientific and technical activities. Year, province dummies are included.

Source: The authors' calculation