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The Spillover Effect of FDI on Domestic Firms: The Case of Vietnam

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ABSTRACT

The paper examines the impact of spillover effects of FDI on the performance and wage level of Vietnamese firms. By making use of the panel data from 2007 to 2018 at the firm level, the paper finds the following results. FDI labour-turnover has the biggest impact on the manufacturing sector. In the manufacturing sector, FDI labour-turnover has the biggest impact on the manufacture of computers, electronics and optical, the manufacture of motor vehicles, the manufacture of leather, and the manufacture of electrical equipment. FDI labour-turnover has a positive impact on the performance of domestic firms in which the large firm enjoy the most benefits from FDI. FDI labour-turnover and FDI backward linkage have positive impacts on the wage level of domestic firms.

JEL Classification: F2, L6, O1

Keywords: FDI, economic transformation, emerging economy, spillover effect, employment

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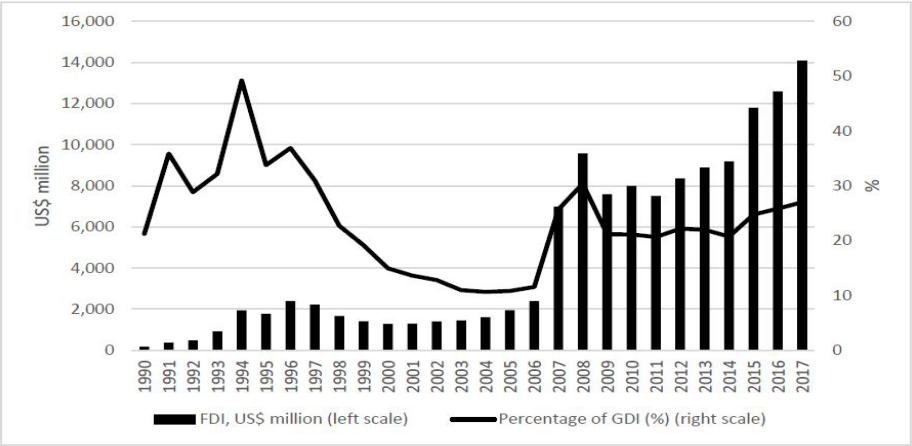
I. INTRODUCTION

Foreign direct investment (FDI) has been playing a significant role in economic growth, in line with globalization, as it is seen in East Asian countries. Vietnam is currently one of the dynamic emerging countries with great potential in Asia (Nguyen, 2020b). In Vietnam, the economic transition towards a market-oriented economy, or *Doi Moi*, began in 1986, has attracted the international attention, including that of foreign investors. FDI in Vietnam has come from over 60 countries and territories around the world, mainly from Asia (Pham, 2003, Ministry of Planning and Investment, 2018). In terms of impacts on the economic structure of the country, FDI was equivalent to over 9% of GDP in Vietnam – well above those of China and Malaysia (5-6%). This made Vietnam the highest recipient of FDI relative to the size of its economy (World Bank, 2000; Nguyen and Amin, 2002, Ministry of Planning and Investment, 2018). Total FDI inflows in 2017 were US$ 14.1 million, a two-fold increase compared to the figure in a decade ago (US$ 7.2 million 2006) The Foreign direct investment in Vietnam from 1990-2017: Value (US$ million) and as a percentage of gross domestic investment (GDI) shown in Figure 1 (Athukorala and Nguyen, 2020).

Figure 1
Foreign Direct Investment in Vietnam, 1990-2017: Value (US$ Million) and As a Percentage of Gross Domestic Investment (GDI)



Source: Athukorala and Nguyen (2020)

The simulation results reveal that the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) will increase the growth rate of FDI into Vietnam from 2.0%-2.4% /year compared to the base scenario. However, the degree of impact will change over time. Between 2019 and 2025, FDI inflows will tend to increase faster than in the following period 2026-2035. This shows that CPTPP will have a faster and stronger impact in the first 6 years (2019-2025) when the agreement officially takes effect for Vietnam. Then the impact will decrease gradually in the following years (Ha and Nguyen, 2020).

FDI is perceived as an engine of growth, by policymakers, which is expected to generate productivity spillover effects in the host economy, such as increase the volume

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and efficiency of investment, augment the stock of knowledge, facilitate new technology, generate chains of new local suppliers, and open new markets (Vacaflores et al., 2017). Host countries offer different incentives to attract FDI because of various potential benefits, in which the employment effect is often mentioned widely in their industrial development policies, in both direct and indirect dimensions. Regarding the direct channel, FDI can create new jobs for local workers, who often have their high demand for employment transition and income improvement, particularly in populated countries. Among investment types, the greenfield is supposed to create the majority of new jobs while mergers and acquisitions might not bring immediate effects (Dunning and Lundan, 2008). Reversely, privatizations might end up with firm restructuring and then might cause job losses (Geishecker and Hunya, 2005). Additionally, FDI can generate the spill-over effects to domestic sectors. It could be both horizontal and vertical spillover ones. In terms of horizontal spillover effect, there are four channels: imitation, labour turnover, competition and export (Görg and Greenaway, 2003). There are two types of vertical spillover effect, including forward and backward linkages. The indirect employment effect can be seen in the horizontal spillover effect within the labour turnover. FDI firms are supposed to hold high technology and advanced management, hence workers in FDI firms could be equipped higher skills to meet the requirement at work. Consequently, when those workers move to domestic firms, they might help to improve the capability of domestic firms. This channel is considered as one of the most important spillover effect (Haacker, 1999; Djankov and Hoekman, 2000; Görg and Strobl, 2001). Another important aspect of the employment effect of FDI is the wage for workers. The domestic firms may have to pay higher wage to attract high-skilled workers or trained workers from FDI ones. According to a recent research work in Vietnam, salary is the most concern by workers at work and the main reason for work disputes (Oxfam, 2019). Salary might be a strong motivation for workers to move from FDI firms to domestic ones and vice versa. Therefore, the paper examines the impact of labour spillover effect on the performance and the wage level of domestic firms in the case of Vietnam.

The paper is constructed in the following sequence. The section 2 emphasizes the theoretical and literature review and elaborates on different approaches of FDI spillover effects. The section 3 presents a methodology to examine the impact of labour spillover effect on the performance and wage level of domestic firms. The next section will discuss the results while the final part will withdraw some conclusions from the findings.

II. LITERATURE REVIEW

FDI is playing an important role in restructuring the economy of the recipient countries. It provides rapid growth in production, export, high skilled labour creation, developed financial sector, and infrastructural development. FDI can have different effects on employment, varying by country, industry, time and institutional factors (Vacaflores, et al., 2017). Vietnam has achieved many results in attracting FDI inflows and commercial transactions with other countries. In 2018, FDI accounted for 24.4% of the total social investment (Nguyen, 2020a). Concerning the impact of FDI on employment, policymakers believe that FDI has a positive impact on employment (United Nations, 2003). The direct effect of FDI on employment may lead to different trajectories in

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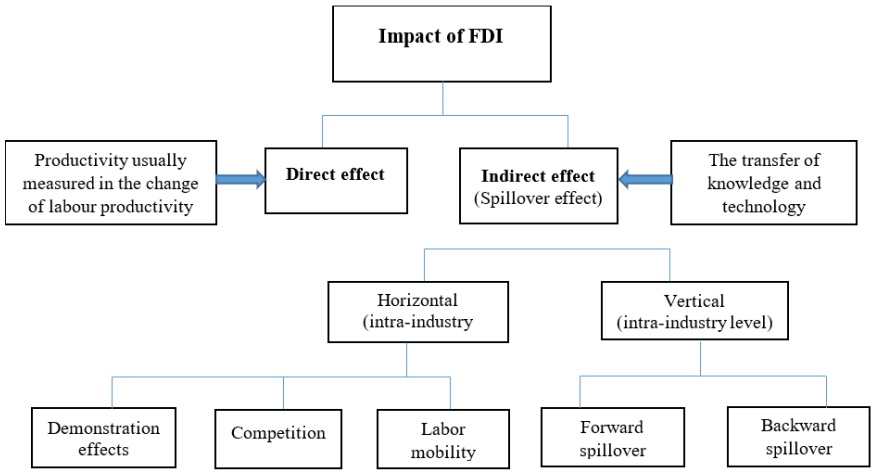
employment while the indirect one on employment depends on forward and backward linkages in the host country (Vacaflores et al., 2017). However, FDI can strongly impacts if its effect goes beyond the intended target (enterprises) (Figure 2).

Figure 2
Impact of FDI



Source: Authors

It has been said that FDI has its direct and indirect effects on economic growth based on the logic that the entry of any company with increased productivity positively influences domestic firms and their competitiveness. It might be affected in a direct as well as an indirect (spillover) way.

A. Direct Effect

The direct effects are generally studied on the productivity usually measured in the change of labour productivity of the enterprises, which came under foreign investment. The direct effect arises from FDI-led increase in the supply of capital which increases the overall production capacity of the host economy (Anwar and Nguyen, 2011). The domestic firms those are not being able to compete within any particular sector subdued to foreign entry will eventually be pushed out of the market (Kathuria, 2000; Damijanet al., 2013). The study of Aitken and Harrison (1999) on Venezuela showed that foreign direct investments can cause negative upshots on the productivity of domestic companies. This is also consistent with a study on the impacts of FDI on India (Kathuria, 2000). FDI can bring negative consequences on the domestic enterprises in two ways: firstly, they can allocate their market share and secondly, they can attract the best human capital, thus affecting the local economy of the acceptable quality of resources. Because of these developments, domestic enterprises might suffer drawbacks of economies of scale and higher costs (Aitken and Harrison, 1999; Girma and Görg, 2007). The realized importance of FDI in generating direct effect is highly praised because FDI enterprises, particularly multinational companies (MNCs), are usually large and typically able to bring the greatest impact on employment (Levinsohn, 1999).

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In the meanwhile, the analysis of the direct impact of FDI on employment depends on the MNC's mode of entry. Greenfield FDI (i.e., the creation of new production facilities) is anticipated to have direct and positive employment effects in the MNC's subsidiary. The alternative mode of entry, merger, or acquisition of firms in host countries is thought to have a neutral short-run direct effect on employment. In the long run, however, MNCs often invest in new technology that alters their capital-labour ratio and has a negative direct effect on employment (Dicken, 2011). Hence, its direct impacts on employment depend on the interaction between productivity growth, output growth, and specialization of labour. Thus, FDI's direct effect on employment may be varied in the host country, i.e., increase, decrease or no change.

B. Indirect Effect

In addition to the direct effect, FDI has also an indirect effect in the form of externalities (i.e., spillover) to home enterprises. Spillover is basically attributed to the transfer of knowledge and technology from foreign companies to the local ones. In other words, we can say that local industries can learn from MNCs investing in the country and also identify the aftereffect of the ownership at the industry level regarding the domestic firm productivity. This is the major concern because of enterprises/region-specific shock which causes endogeneity concern (Apostolov, 2017). Regarding Vietnam, on the one hand, the majority of the foreign investors in Vietnam are small and medium enterprises from ASEAN or the Asian NICs, which do not often have ability to access to the latest technology. On the other hand, the cheap labour cost limits the opportunities to introduce modern technology since the country becomes the attractive destination for labour intensive industries. However, the technology transfer process from the FDI flows also led to several problems viz. transfer pricing and the import of old technology and equipment. The main problem of transfer pricing occurs when foreign investors overstate the price of imported machinery, equipment and technology. In many cases, the stated price can be 10-20% higher than the world market prices (Pham, 2003; Nguyen, 1996).

Spillover is usually divided into horizontal and vertical ones. The horizontal spillover covers domestic enterprises at the intra-industry level, while the vertical one at an inter-industry level as in the case of technology transfer to the domestic suppliers or to the customers in the market. Enterprises that are working in the other sectors and are not related to the foreign enterprises, they are likely to be affected by the FDI if they are related in direct work or business with it through the supply of raw materials, services etc. Because foreign enterprises necessitate higher quality standards from their suppliers to meet their quality standards. Although the direct effect of FDI on performance can be quite clearly understood, the indirect one is still uncertain due to the fact that the results vary between countríe according to the method of analysis or econometric methodology (Hanousek et al., 2011). Notably, most of the research works analyzing the spillover effect focus on the single country study. Several researches have tried to cover the direct and indirect effect of FDI on employment. Becker et al. (2005) and Kokko (2006) have explored the impacts of FDI on home-country employment in decades, reflecting common concerns on FDI that it may hollow domestic job opportunities by transferring the domestic production process abroad. Using country-level data on FDI, trade, and employment, some researches estimated empirically the

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substitutable negative relationship between FDI and home-country employment. Javorcik (2004) and Barrios et al. (2011) indicated that the increased performance of domestic firms due to an increase in overall business process standards and such spillovers is often found to be positive and deserved to be considerable. However, the other researches on developed countries provide evidences on positive productivity spillovers, such as the study on UK manufacturing plants (Haskel et al., 2007) or US manufacturing plants (Keller and Yeaple, 2009).

The economic hypothesis concerning to the potential effect of trade openness on economic growth in main areas viz. improvement in the efficiency of scarce resource allocation, technology spillover effects from developed countries to developing countries, learning-by-doing effects, etc (Çevik et al., 2019).

The FDI in the international market is supposed to have positive influences the performances of the local economy since it follows the same corporate policy everywhere. The foreign firms are willing to transfer technology to particular selected local firms to avoid the single suppliers bargaining power (Blalock and Gertler, 2008). In addition, it is more beneficial for the enterprises to increase the demand on their products by providing the support to domestic consumers and the transfer of process skills (Zhang et al., 2014). In this case, spillover can be found indirectly in four ways namely: (a) improved and higher productivity with higher product quality; (b) economies of scale for domestic enterprises achieved by supplying foreign firms and new entries of domestic enterprises to the same market on behalf of increased demand; (c) the increased productivity of the domestic enterprises due to the easy and smooth availability of the technological goods or downstream technology diffusion through trade and (d) some provisions that are linked to horizontal spillovers, such as imitation or employment turnover are incorporated in vertical spillover as well.

Chen et al. (2016) finds that foreign ownership in China during 1998-2007 significantly affected employment elasticity, but the impact differs depending on the industry and the firm's production and sales patterns. Brincikova and Darmo (2014), by analysing the impact of FDI on employment in the Visegrad Four countries during 1993- 2012, found no statistically significant impact of FDI on employment. Through the examination of the effect of FDI on employment in Latin America during 1980-2006, Vacaflores (2011) found a positive and significant effect on employment generation in host countries, which have high levels of informality and below-average FDI inflows. In the meanwhile, Lipsey et al. (2013) examined Indonesian plants in the stage of 1997-2005 and found that the engagement of foreign firms led to higher rates of employment growth. Thus, it can be said that the employment impact of FDI is very indecisive, both theoretically and empirically.

III. METHODOLOGY

A. Model

Spill-over effects of FDI are measured based on the methodology of Javorcik (2004). There are three spill-over variables: *Forward, Backward* and *Horizontal*.

$$Horizontal_{jt} = \frac{\sum_{i \in j} Foreign\ share_{it} * A_{it}}{\sum_{i \in j} A_{it}} \quad (1)$$

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A_{it} can be revenue of firm i in the industry j or total labor of firm i in the industry j. Therefore, horizontal represents for the appearance of FDI in the industry j. This paper uses total labor to capture labour turnover effect (Aitken and Harrison 1999; Le and Pomfret 2011; Thang et al. 2016; Vu and Le 2017).

$$Backward_{jt} = \sum_{k \neq j} a_{jk} * Horizontal_{jt} \quad (2)$$

a_{jk} is the proportion of industry j's ouput consumed by industry k. Note that $k \neq j$. This coefficient is collected from the Input-Output table of Vietnam in 2012. It is assumed that this coefficient does not change from 2008 to 2018.

$$Forward_{jt} = \sum_{m \neq j} b_{jm} * Horizontal_{jt} \quad (3)$$

Where b_{jm} is the proportion of industry m's output consumed by industry j to produce final outputs. Once again, this coefficient is taken from the Input-Output table 2012.Then, the impact of spillovers which is based on labour turnover on domestic firms is estimated by the following model:

$$y_{ijt} = \alpha + \beta_1 k_{ijt} + \beta_2 l_{ijt} + \beta_3 spill_{jt} + \beta_4 X_{ijt} + \varepsilon_{ijt} \quad (4)$$

Where i is firm i, j is sector j and t is time t. *Y* is output of domestic firm, *K* is fixed capital of domestic firm and *L* is total labour of domestic firm. *Spill* is FDI spillovers include three measurements: horizontal effect (*Horizontal)* backward linkage (*Backward*). It is noted that this paper only examines the impact of horizontal and backward spillovers because the forward linkage is unlikely to happen in Vietnam. The gap between FDI firms and Vietnamese ones is quite large and the latter can only be providers of the latter, not vice versa. *X* is the set of other control variables including HHI (*concentration index), human capital* and *institutions* and *age* of firms. The year and sector dummies are also added to control for time and sector effects. Additionally, the paper creates interactions terms between spill-over and firms' age and size.

Moreover, the impact of FDI spillovers on the wage level of domestic firms is examined in the following model:

$$w_{ijt} = \alpha + \beta_1 spill_{jt} + \beta_4 X_{ijt} + \varepsilon_{ijt} \quad (5)$$

Where w is the wage level of domestic firm i in the industry j in time t. The paper based on the paper of Lipsey and Sjoholm (2001) and add some other control variables X. They include the female share, dummy size of firms, age of firms. HHI index, year dummy, sector dummy and state-firm dummy. The Hausman test is used to show if fixed effect or random effect is more suitable.

B. Data

The paper uses the panel data from 2007 to 2018 that is constructed from the Annual Enterprises Survey in Vietnam. The database provides basic information including operating industries, output, revenue, employees, fixed capital and wage of workers,

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ownership, establishing year. Only repeated firms in the period 2007-2018 are kept to create a strong balanced panel data. Therefore, from 2007 to 2018, there are 117,552 observations including repeated 9,976 firms. The database covers 05 sectors namely Mining, Manufacturing, Manufacturing and Distribution Electricity, Water supply and management and Construction.

In the equation (4), y_{jit}, k_{jit}, l_{jit} are logarithm of total revenue, fixed assets and total labour of domestic firm i in the industry j in time t. $Spill_{jt}$ included $Horizontal_{jt}$, $Backward_{jt}$, $Forward_{jt}$ which are described above. X_{jit} is a set of other control variables *including concentration index, human capital,* institutions and *age of firms*. *Concentration index* is a Herfindhal index of two-digit industry concentration which is log-transformed. *Human capital* is proxied by wage level assuming that higher skilled labour can receive higher wage. Therefore, if a firm pays higher wage per cap, it can have better human capital. Firms are categorized into three groups by size based on the revenue. Finally, *institutions* is a provincial variable which is collected from PCI index in Vietnam. This index allows us to compare the institutional environment among provinces in Vietnam[1]. The age of firm is the minus between the current year and the establishing year of firms. All monetary variables are adjusted by consumer price index. In the equation (5), the wage paid by domestic firms is measured by the real average level of wage per month and female share is the share of female workers in the total number of workers of firms. The description for all variables can be seen in the Table 1.

Table 1
Variable Description

Variable	Obs	Mean	Std. Dev.	Min	Max
Revenue	95,965	85313.7	426907.7	0.6515	31900000.00
Labor	95,965	31673.6	165984.5	1.4869	8967072.00
Capital	95,965	172.0128	482.7297	1.0000	20963.00
Human capital	95,965	3.434679	14.07586	0.0024	4252.99
Age	95,965	13.74197	9.924703	1.0000	87.00
Hor	95,965	0.239243	0.242509	0.0000021	0.98
Back	95,965	0.108908	0.193187	0.0000032	1.08
pci	95,965	59.80131	5.011446	36.3901	77.20
HHI	95,965	38999.81	4113.267	32421.9800	45524.14
Female share	95,869	0.31133	0.216201	0.0007	1.75

Source: Author

IV. RESULTS

A. Direct Effects

The first direct effect on Vietnam's employment brought by the FDI sector is creating more jobs in the economy.

The number of employees in the FDI sector in 2007 after Vietnam joined WTO is 1562.2 thousand people. In 2008, more than 132 thousand jobs were created in this sector to raise total number of employees to 1694.4 thousand. However, this number significantly decreases nearly 170 thousand in the FDI sector in 2009 due to global

[1] For further detail, please look at http://eng.pcivietnam.org/

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economic crisis. The total employment in this sector had increased continuously from 2010 to 2019. More than 204 thousand jobs were created in 2010, while 369.4 thousand in 2011. In 2017, number of new jobs sharply raised to 616.8 thousand. Until 2019, there were 4768.4 thousand of jobs created in the FDI sector. In short, over 12 years from 2007 to 2019, the number of jobs in this sector increases more than 3 times.

Table 2
Number or Employee in FDI Sector

	Number of employments in FDI sector (Thousand people)	**The gap compared with previous year (job creation)**	**Changing ratio (%)**
2007	1562.2		
2008	1694.4	132.2	8.5
2009	1524.6	-169.8	-10.0
2010	1729.2	204.6	13.4
2011	2098.6	369.4	21.4
2012	2249.8	151.2	7.2
2013	2518.3	268.5	11.9
2014	2868.1	349.8	13.9
2015	3197.8	329.7	11.5
2016	3591	393.2	12.3
2017	4207.8	616.8	17.2
2018	4541.2	333.4	7.9
2019	4768.4	227.2	5.0

Source: GSO (2020d)

The contribution of the FDI sector on the total employment increases very significantly from 2007 to 2019 (Table 3). The number of jobs created by the FDI sector accounts for 3.5 percent of total jobs in 2007 and 8.7 percent in 2019. In fact, the FDI sector has been playing a crucial role in creating jobs for Vietnam economy.

Table 3
The Percentage of Employment by Ownership (%)

	State owned sector	**Private sector**	**FDI sector**	**Total**
2007	11	85.5	3.5	100
2008	10.9	85.5	3.6	100
2009	10.6	86.2	3.2	100
2010	10.2	86.3	3.5	100
2011	9.9	85.9	4.2	100
2012	9.7	85.9	4.4	100
2013	9.5	85.7	4.8	100
2014	9.2	85.4	5.4	100
2015	9	85	6	100
2016	8.8	84.5	6.7	100
2017	8.6	83.6	7.8	100
2018	8.3	83.3	8.4	100
2019	7.7	83.6	8.7	100

Source: GSO (2020d)

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Table 4
The Percentage of Annual Employment by Types of Economic Activities

TOTAL	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
	100	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Agriculture, forestry, and fishing	52.9	52.3	51.5	49.5	48.4	47.4	46.7	46.3	43.6	41.6	40	37.6	34.5
Mining and quarrying	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Manufacturing	12.5	12.9	13.5	13.5	13.8	13.8	13.9	14.1	15.9	17	17.8	18.4	20.7
Electricity, gas, stream and air conditioning supply	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Water supply, sewerage, waste management and remediation activities	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Construction	5.2	5.3	5.4	6.3	6.4	6.4	6.3	6.3	6.2	7.2	7.5	7.9	8.4
Wholesale and retail trade; repair of motor vehicles and motorcycles	10.9	11	10.8	11.3	11.6	12.3	12.6	12.6	12.7	12.7	12.8	13.4	13.3
Transportation and storage	3	3.1	3	2.9	2.8	2.9	2.9	2.9	3.1	3	3.2	3.2	3.5
Accommodation and food service activities	2.4	2.8	3.3	3.5	4	4.2	4.2	4.4	4.6	4.6	4.6	5	5
Information and communication	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6
Financial, banking and insurance activities	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.9
Real estate activities	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.6
Professional, scientific and technical activities	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6
Administrative and support service activities	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.6	0.6	0.7
Activities of Communist Party, socio-political organizations; public administration and defence; compulsory security	3.7	3.6	3.3	3.2	3.1	3.1	3.1	3.2	3.2	3.2	3.2	3	2.7
Education and training	3.3	3.2	3.3	3.4	3.4	3.4	3.5	3.5	3.5	3.5	3.6	3.8	3.6
Human health and social work activities	0.9	0.8	0.8	0.9	1	0.9	0.9	0.9	1	1.1	1	1.1	1.1
Arts, entertainment and recreation	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Other service activities	1.6	1.5	1.2	1.4	1.5	1.4	1.4	1.4	1.6	1.6	1.6	1.7	1.8
Activities of households as employers; undifferentiated goods and services producing activities of households for own use	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4

Source: GSO (2020a)

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The share of jobs in agriculture, forestry and fishing sector had decreased dramatically over 12 years from 2007 to 2019. More than 52 percent of total jobs are in agriculture, forestry, and fishing in 2007 while only 34.5 percent in 2019. In 2007, the manufacturing sector accounts for 12.5 percent of the total employment and in 2019, it increases to 20.7 percent. It is noted that most of FDI firms have been operating in the manufacturing sector. After joining WTO in 2006, FDI flows started to rush to Vietnam. This trend also stimulated the transition of labour from agricultural sector to FDI one where the productivity and the income are much higher.

From Table 5, in 2007, the labour productivity of FDI firms are much higher than other sectors. The productivity of FDI firms is 200 million VND/person while that of State-owned and private ones is 127 million VND/person and 22.6 million VND/person correspondingly. Over 12 years, the labour productivity of FDI firms decreased from 200 to 153.64 127 million VND/person, while that state-owned enterprises firms increased from 127.45 to 224.14 million VND/person thank to the advantage of resource allocation, especially the natural resource.

Table 6 indicates the average wage and wage growth rate by ownership from 2010-2018. The average monthly wage in FDI firms is 3,007 thousand Vietnam Dong in 2010 and it increases to 6,622 thousand Vietnam Dong in 2018. Over nearly 10 years, the average wage growth rate in the FDI sector is 10.6 percent. While the average month wage in the FDI sector is quite high, compared with other types of ownership. That might be attributed to the movement of labour from other sectors to this sector.

Table 5

Labour Productivity by Ownership (At Constant 2010 Prices)

	Total	State-owned enterprise	Private enterprise	FDI enterprise
2007	40.27	127.45	22.57	200.05
2008	41.41	131.15	23.25	198.92
2009	42.47	136.88	23.90	231.70
2010	43.93	126.00	21.88	189.09
2011	45.35	132.05	23.04	167.79
2012	46.68	139.92	23.87	168.12
2013	48.44	147.24	24.69	162.00
2014	50.83	156.39	25.97	154.26
2015	54.15	168.70	27.70	153.17
2016	57.26	180.40	29.27	149.43
2017	60.75	192.39	31.20	143.67
2018	64.36	202.37	33.26	149.33
2019	68.40	224.14	35.86	153.64

Unit: Million VND/person/year

Source: Authors compute from GSO (2020b) and GSO (2020c)

Table 6

The Average Wage and Growth Rate by Ownership From 2010-2018

Ownership	Average monthly wage (thousand Vietnam Dong)									Growth rate (%)
	2010	2011	2012	2013	2014	2015	2016	2017	2018	
Household/individual	1,946	2,286	2,729	2,910	3,194	3,514	3,797	4,139	4,504	11.3
Private sector	2,742	3,455	3,681	4,536	4,879	5,148	5,572	6,071	6,580	11.4
State sector	2,945	3,682	4,514	5,097	5,283	5,532	5,834	6,197	6,523	9.1
State owned firms	N/A	4,715	5,466	5,872	6,134	6,392	6,859	7,322	7,663	6.4
FDI sector	3,007	3,869	4,450	4,747	5,136	5,306	5,833	6,261	6,622	10.6

Source: ILSSA (2020)

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Table 7
The Number and Proportion of Employment with Social Insurance by Ownership (In Million)

	2010	2012	2016	2018	2019	Growth rate/year 2018-2019	Growth rate/year 2010-2019
1. The number of employees with social insurance (thousand people)	**9,522.6**	**10,565.4**	**12,852.0**	**14,455.0**	**15,200.0**	**6.5**	**5.5**
Governmental agencies	3,302.2	3,546.0	3,730.0	3,738.0	3,684.0	-1.3	1.7
State-owned enterprises	1,268.0	1,220.4	1,073.0	999.0	961.0	-3.8	-2.5
Private enterprise	2,451.9	2,742.2	3,769,0	4,720.0	5,207.0	15.0	8.4
FDI enterprises	2,014.1	2,507.7	3,747.0	4,403.0	4,736.0	7.6	10.4
Cooperative, self-employment, etc.	486.4	549.1	533.0	595.0	612.0	6.7	7.2
2. The proportion of employees with social insurance (%)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**		
Governmental agencies	34.7	33.6	29.0	25.9	24.2		
State-owned enterprises	13.3	11.6	8.3	6.9	6.3		
Private enterprise	25.7	26.0	29.3	32.7	34.3		
FDI enterprises	21.2	23.7	29.2	30.5	31.2		
Cooperative, self-employment, etc.	5.1	5.2	4.1	4.1	4.0		

Source: ILSSA (2020a)

According to ILSSA (2020a), the total employees in the FDI sector covered by social insurance[2] is more than 2 million, accounting for 21.2 percent of total employees in Vietnam in 2010. Over nearly 10 years, in 2019, total number of employees covered by social insurance is 4.736 million people, accounting for 31.2 percent of total employees in Vietnam. It means that, in the FDI sector, employees are increasingly covered by social insurance in particular and the social security system in general.

So, FDI has an important influence on the Vietnam's employment and economy, by not only contributing to the economic growth but also ensuring the social stability through creating a numerous of jobs. In addition, this sector plays a part in the consolidation of the social protection in Vietnam when the number of insured employees of FDI firms increase dramatically every year. It also has a positive effect on improving labour productivity of Vietnamese workers.

B. FDI Spill-Over Effects

The paper examines the horizontal impacts across 5 sectors: Mining, Manufacturing, Manufacturing and Distribution Electricity, Water supply and management and Construction. The horizontal impact is calculated by the share of FDI workers and then it is proxied for the labour-turnover effect of FDI. From Figure 3, we can see that the FDI labour-turnover has the biggest impact in the manufacturing sector and there is a big gap between the manufacturing sector and the other ones. Importantly, there is a significant upward trend of labour-turnover impact only in the manufacturing sector over years.

The manufacturing sector consists of 24 sub-sectors, in which computer, electronic and optical parts have the highest level of FDI labour-turnover. They are followed by the manufactures of motor vehicles, manufacture of leather, manufacture

[2] Social insurance in Vietnam is commonly known as pension insurance in other countries

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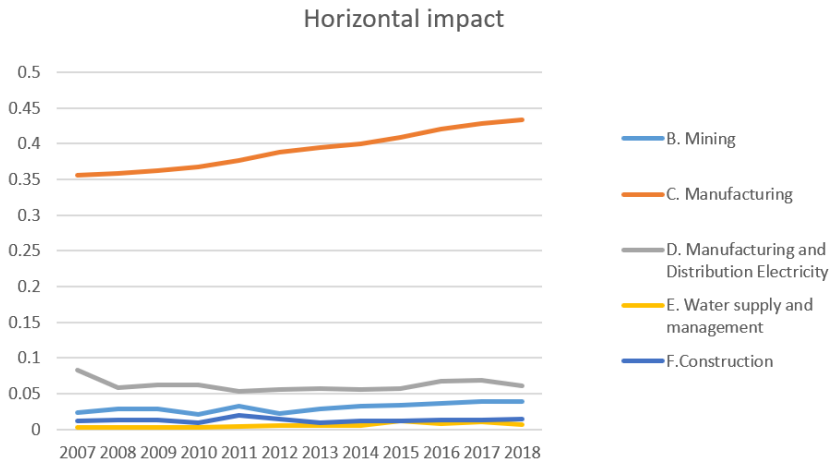
of electrical equipment. Several big FDI firms those are operating in Vietnam in these sub-sectors include Samsung, LG, Canon, Foxconn, Honda, Canon, Intel, etc.

Figure 3
The Horizontal Impact Across Sectors from 2007 to 2018



Source: Authors

Table 8
Labour Turnover by Manufacture

Sub-sector	2007	2011	2015	2018	Average	Rank
Manufacture of computer, electronic and optical	0.909	0.956	0.968	0.977	0.952	1
Other manufacturing	0.893	0.841	0.897	0.913	0.886	2
Manufacture of motor vehicles; trailers and semitrailers	0.662	0.805	0.859	0.880	0.801	3
Manufacture of leather and related products	0.752	0.809	0.798	0.815	0.793	4
Manufacture of electrical equipment	0.766	0.754	0.742	0.714	0.744	5
Manufacture of other transport equipment	0.514	0.681	0.783	0.845	0.706	6
Manufacture of furniture	0.517	0.540	0.622	0.626	0.576	7
Manufacture of wearing apparel	0.560	0.573	0.583	0.588	0.576	8
Manufacture of rubber and plastics products	0.574	0.564	0.571	0.575	0.571	9
Manufacture of machinery and equipment n.e.c	0.374	0.508	0.612	0.652	0.537	10
Manufacture of fabricated metal products, except	0.497	0.523	0.536	0.548	0.526	11
Manufacture of textiles	0.405	0.490	0.513	0.514	0.481	12
Manufacture of chemicals and chemical products	0.327	0.364	0.415	0.460	0.392	13
Manufacture of paper and paper products	0.332	0.341	0.328	0.415	0.354	14
Manufacture of basic metals	0.198	0.240	0.356	0.394	0.297	15
Manufacture of coke and refined petroleum	0.277	0.111	0.234	0.322	0.236	16
Manufacture of food products	0.194	0.221	0.253	0.272	0.235	17
Manufacture of wood and of products of wood and	0.256	0.212	0.232	0.221	0.230	18
Manufacture of beverages	0.175	0.191	0.300	0.242	0.227	19
Manufacture of pharmaceuticals, medicinal	0.174	0.212	0.261	0.240	0.222	20
Manufacture of other non-metallic mineral products	0.125	0.139	0.173	0.214	0.163	21
Repair and installation of machinery and equipment	0.060	0.018	0.034	0.378	0.122	22
Printing and reproduction of recorded media	0.089	0.074	0.118	0.157	0.110	23
Manufacture of tobacco products	0.032	0.029	0.047	0.047	0.039	24

Source: Authors

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C. Regression Results

1. FDI Spill-Overs and the Performance of Domestic Firms

The Hausman test shows that the fixed effect model is more suitable in this case. The estimation results from the fixed effect can be seen from Model 1 of Table 9. Generally, labour and capital are the key factors of the production function and they have positive impacts on the performance of domestic firms from 2007 to 2018. More specifically, a 1% increase in the number of workers and fixed assets for production might yield a 0.505% and 0.1334% increase in revenue of Vietnamese firms. Additionally, human capital also brings a positive influence on domestic firms. It implies that the more skilled workers a firm can hire; the more revenue this firm can gain. Moreover, institutions factors play an important role in accelerating the performance of Vietnamese firms. 1% increase in the PCI index can generate a 0.165% increase in the revenue of firms. The result also shows the positive impact of the concentration index (HHI) but the magnitude of the coefficient is small (0.00067). Furthermore, the dummy variable of firm size shows that there are differences between large and medium firms compared to small firms during the period of 2007- 2018. Then, the impact of age on the performance of Vietnamese firms is positive. Notably, all these coefficients are statistically significant at the 0.1% level.

The key independent variables in the model are horizontal and backward ones. Both of them have positive coefficients. That the coefficient of horizontal effect is 0.039 means FDI firms generate positive externalities to domestic firms in the same industry. Note that, the horizontal effect in this paper is proxied by the share of workers of FDI firms. Therefore, it can be interpreted that the FDI firms can generate a positive labour-turnover to domestic firms. This is an essential impact of FDI which helps the domestic sector to have better-skilled workers. The model shows that a 1% increase in labour-turnover might bring a 0.039% increase in the performance of domestic firms. That the coefficient of backward linkage is 0.009 implies that the presence of FDI firms can create more chances for domestic firms when the latter are providers of the former. Unfortunately, this coefficient is not statistically significant. Hence, it is unable to confirm this linkage from the paper.

This research then examines the impact of size and age of firms on the labour-turnover effects on domestic firms. The interaction term between horizontal effect and firms' size and age are estimated. The positive and statistically significant coefficient of the interaction term from Model 4 of Table 9 shows that large firms enjoy more benefits from labour-turnover. The magnitude of horizontal variable coefficient now is 0.0174 + 0.0373 = 0.0547. It can be seen that a 1% increase in labour-turnover might bring a 0.0547% increase in the performance of domestic firms, which is higher than the single impact of horizontal variable (0.039). The results from Model 2 and Model 3 of Table 9 also indicate that small and medium firms do not benefit from labour-turnover effect when the coefficients of these interaction terms are not statistically significant. Model 5 of Table 9 shows the result of the model with the interaction term between horizontal effect and age of firms. That the coefficient of the interaction is negative means that when the age of firms increases, the impact of horizontal variable decreases. It can be explained by the life cycle of firms which is linear with the age of firms. Firms reach their peak after few years and their productivity can be diminished

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then. Note that the negative sign of the interaction term does not show the negativeness of the impact from FDI labour-turnover, it only indicates the fact that the impact is increasingly lower over years.

Table 9

Regression Results the Impacts of FDI Spill-Overs and The Performance of Domestic Firms

	Model 1 (coef/SE)	Model 2 (coef/SE)	Model 3 (coef/SE)	Model 4 (coef/SE)	Model 5 (coef/SE)
Labor	0.5053*** (0.0040)	0.5134*** (0.0040)	0.5235*** (0.0040)	0.5180*** (0.0040)	0.5252*** (0.0040)
Capital	0.1334*** (0.0036)	0.1450*** (0.0036)	0.1644*** (0.0035)	0.1583*** (0.0035)	0.1686*** (0.0035)
Human capital	0.3044*** (0.0039)	0.3069*** (0.0039)	0.3104*** (0.0040)	0.3087*** (0.0039)	0.3117*** (0.0040)
Age	0.1341*** (0.0119)	0.1359*** (0.0120)	0.1437*** (0.0120)	0.1466*** (0.0120)	0.1113*** (0.0141)
Hor	0.0394*** (0.0086)	0.0426*** (0.0089)	0.0429*** (0.0087)	0.0373*** (0.0086)	0.0672*** (0.0102)
Back	0.0090 (0.0306)	0.0219 (0.0307)	0.0277 (0.0308)	0.0133 (0.0307)	0.0135 (0.0309)
Institutions	0.1652*** (0.0388)	0.1588*** (0.0389)	0.1686*** (0.0391)	0.1884*** (0.0390)	0.1470*** (0.0396)
HHI	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)
Size					
2.Medium	0.2515*** (0.0090)				
3.Large	0.5678*** (0.0165)				
hor*small		-0.0024 (0.0042)			
small		-0.2553*** (0.0145)			
hor*medium			-0.0044 (0.0038)		
medium			0.0695*** (0.0126)		
hor*large				0.0174** (0.0066)	
large				0.3576*** (0.0224)	
hor*age					-0.0129*** (0.0027)
year dummy	yes	yes	yes	yes	yes
sector dummy	yes	yes	yes	yes	yes
Constant	2.8675*** (0.5927)	3.1997*** (0.5948)	2.8307*** (0.5967)	2.5797*** (0.5956)	3.1647***(0.6040)
N	95959	95959	95959	95959	95959
r2_o	0.7313	0.7239	0.7117	0.7185	0.7099
sigma_u	0.9087	0.9384	0.9684	0.9386	0.9711
sigma_e	0.6239	0.6258	0.6281	0.6267	0.6284
F	592.0120	578.9480	563.0216	572.7358	571.0885

Dependent variable: The revenue of domestic firms (performance of domestic firms)

Note: Adjusted Standard errors in parentheses

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001"

2. FDI spillovers and the wage level of domestic firms

The level of wage is another important aspect of employment. The appearance of FDI firms is supposed to increase the level of wage for local workers. FDI can either pay higher salary or generate competition from which domestic firms must pay higher to recruit workers. At the first glance, the correlation between the average wage level of domestic firms and horizontal and backward effects are positive and significant (Table 10). Based on the value of the coefficient, we can say that the correlations are medium. It implies that an increase in one variable is accompanied by an increase in another. However, the Pearson correlation cannot show the casual relationship amongst variables. Therefore, the paper applies the fix-effect model to see the impacts of spillovers on the wage level of domestic firms.

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Table 10
Pearson Correlation between Horizontal Effect, Backward Linkage and Average Wage Level

Pearson correlation	Average wage level
Horizontal effect	0.3310*
Backward linkage	0.4807*

*Statistically significant at the 0.1% level
Source: Authors

The results show that both horizontal and backward effects have positive impacts on the wage level of domestic firms and both coefficients are statistically significant at a 0.1% level. Interestingly, the impacts within sectors (horizontal) and between sectors (backward) are similar when the magnitudes of the coefficient are 0.1628 and 0.1760. Once again, it is noteworthy that the horizontal effect is referred to as labour-turnover effect. It means that the way FDI firms recruit their workers positively influences the wage level of domestic firms. Regarding backward linkage in the case of domestic firms being providers of FDI firms, they must meet several requirements from demanders to compete with other providers. Therefore, the domestic firms must improve their capability which includes their workers' capacity. Consequently, workers can benefit from this process. Table 11 also shows other significant variables including female share, HHI index, size of firms, and state firms' dummy. The model controls the year and sector effect by adding year and sector dummy into the regression.

Table 11
Regression Results the Impacts of Spillovers on the Wage Level of Domestic Firms

lh	0.1628*** (0.0131)
lb	0.1760*** (0.0119)
fms	0.4063*** (0.0237)
la	0.0001 (0.0164)
HHI	0.0001*** (0.0000)
state	0.0442 + (0.0231)
2.Medium	0.0677*** (0.0103)
3.Large	0.1197*** (0.0192)
sector dummy	yes
year dummy	yes
N	95863
r2_o	0.3374
sigma_u	0.7111
sigma_e	0.5825
F	94.7150

Dependent variable: The wage level of domestic firms
Source: Authors
Adjusted standard errors in parentheses; + $p<0.1$, *$p<0.05$, **$p<0.01$, ***$p<0.001$

V. CONCLUSIONS

The study investigates the employment effect of the FDI in Vietnam, regarding the spillover effects. It considered the data obtained from 2007 to 2018 from the Annual Enterprise Survey in Vietnam. The research result showed that the FDI labour-turnover has the biggest impact on the manufacturing sector, in which it has the biggest impact on the manufacture of computer, electronic and optical, motor vehicles, leather and

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electrical equipment. FDI labour-turnover has a positive impact on the performance of domestic firms in which the large firms enjoy the most benefits. FDI labour-turnover and FDI backward linkage also have positive impacts on the wage level of domestic firms. These findings imply that the Government of Vietnam should focus on the quality of FDI investment, i.e, the attraction of large FDI enterprises, particularly those are capital and technology intensive ones in the manufacturing factor. This will facilitate the improvement of performance of domestic enterprises who have been integrating to the world market recently. Furthermore, large and multinational FDI enterprises, with a higher affordability, also have positive impacts on workers' income. This will allow the Government to consolidate its social policies, especially through the enhancement of workers' income and living standards.

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