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IS FDI GOOD FOR EMPLOYMENT? A COMPREHENSIVE LOOK INTO VIETNAMESE FIRMS*

CAO T. H. VINH [a] AND BUI T. DUONG [b]

[a] *Foreign Trade University, Vietnam*
[b] *Development and Policies Research Center, Vietnam*

Taking advantages of a rich firm-level database of Vietnam (with more than 1.3 million observations) and applying fixed effect techniques, we obtained a comprehensive look about three perspectives of quantity, quality, and location effect of FDI on employment (according to UNCTAD, 2014). We found that FDI indeed helps to raise employment (by 0.6%) (the quantity effect) and wages (by 0.3%) (the quality effect) of firms across Vietnam, but makes the provincial employment reduce by about 0.1% (the location effect). In addition, interestingly, the findings are also diversified across the four key industries and two different types of FDI-invested firms.

Keywords: Foreign Direct Investment, Employment, Quantity Effect, Quality Effect, Location Effect, Vietnam, Firm-Level
JEL Classification: F21, E24

1. INTRODUCTION

Foreign Direct Investment (FDI), according to Moosa (2002), is defined as a "process whereby residents of one country (the source country) acquire ownership of assets for the purpose of controlling the production, distribution and other activities of a firm in another country (the host country)". From the characteristic of deep penetration into the operation of invested enterprises, FDI could bring a variety of benefits for host countries such as capital accumulation, job creation, skill upgrading, economic restructuring, etc. Among those, for such a developing country with a large population as Vietnam, the positive effect of FDI on employment is regarded as one of the most

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attractive reasons for Vietnam's attraction of FDI. Normally, the higher value of FDI that the country receives, the more positive employment effect that it expects. In the paper of Vi (2020), citing the talk of the Minister of Labors, War Invalids and Social Affairs, the number of jobs created by FDI has significantly increased. There has been a sharp rise in the number of laborers working in FDI firms from about 330 thousand in 1995 to 6.1 million in 2019. The internal training system of those firms has made a great contribution to upgrading labor skills in Vietnam.

However, despite that positive influence, FDI has caused a wide range of concerns about its effect on employment. For instance, although FDI could lead to job creation, FDI-invested firms recruit skilled labor from foreign countries and unskilled labor from local markets, hence the effect on the quality of employment could be insignificant. According to Dang (2021), the demand for foreign skilled workers in Vietnam has been increasing in the fields related to technology, energy and manufacturing due to a fact that Vietnamese labor could not meet the requirements. As of April 2021, more than 100,000 people have come to Vietnam for work. The more FDI flows into the country, the more foreign-invested firms tend to employ more highly skilled overseas workers. In addition, due to the shift of labor from provinces not getting much FDI to ones obtaining more FDI, the unemployment rate of the provinces receiving FDI does not actually go down. As a result, the question has been raised for Vietnam is "*How is the comprehensive effect of FDI on employment in Vietnam?"*

To comprehensively analyze the employment effect of FDI, UNCTAD (1994) did summarize the three perspectives of the impact, namely the quantity, quality, and location effect. *The quantity effect of employment of FDI* is related to the possibility of creating more jobs for host countries. Besides job creation, the employment effect could also be considered from the rise in wages (regarded as the *quality*) and the addition of jobs in areas (called the *location*). Much research for countries in the world has been done, but has just investigated each or some, not all three perspectives of the above-mentioned employment effect of FDI at the same time. The same situation for literature occurs in Vietnam.

Moreover, due to the unavailability of data at firm-level, most of the research in the world uses the country-level or province level. In comparison with the country and province-level data, the use of firm-level brings many advantages. One important advantage regards the substantial number of observations, which could help achieve a more reliable estimation within a short period of time. In addition, in our point of view, from some perspectives, such as the quality effect of employment, the more proper results could be withdrawn from firm-level rather than the more aggregated data. For example, the data for the proxy for the quality effect (such as wage of labor) could be more reliable from firm level, rather than those provinces or countries – which could be normally obtained from taking an average of firm-level). The lack of research for the above three perspectives using firm-level data occurs similarly to Vietnam.

To bridge the gaps, by using a rich firm-level data of Vietnamese firms (more than 1.3 million of observations), we would like to discover the comprehensive effects of FDI

on employment, by trying to answer the main research question *of whether FDI makes it good for Vietnamese firms for quantity, quality, and location perspectives of employment?*

The rest of the paper is structured as follows: Section 2 clarifies the literature review and theoretical effects of FDI on employment. Section 3 stresses on stylized facts of FDI and employment in Vietnam. Section 4 regards the empirical strategies. Section 5 presents the data, then Section 6 illustrates empirical results, and the last session withdraws conclusions.

2. LITERATURE REVIEW AND THEORETICAL EFFECT OF FDI ON EMPLOYMENT

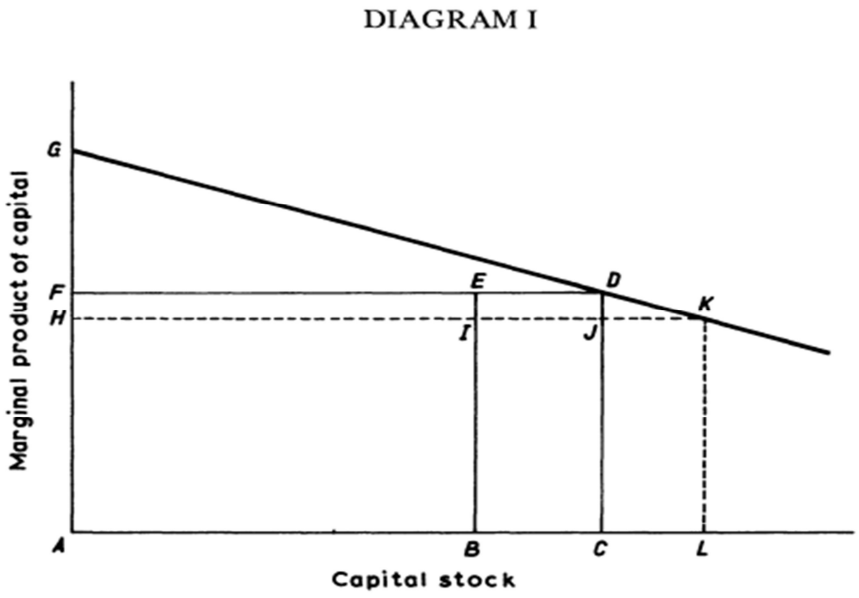
In the literature about FDI's effects, studies investigating the associations of FDI with factors of recipient countries are categorized into different approaches. However, one of the most popular approaches is the standard theory of international trade dating back to MacDougall (1960), which pays attention to the direct effects of FDI on factors such as rewards, employment, and capital flows. Therefore, in this study, authors adopt the traditional trade theory approach to clarify the effects of FDI on employment factor of host countries.

According to UNCTAD (1994), the range of potential effects of FDI on employment could originate from the three perspectives of quantity, quality, and location. The impact of each could be either positive or negative. For example, about the *quantity* effect of employment, although FDI could directly create more jobs for expanding industries, it may result in rationalization and job losses if entering the recipient countries under the mode of acquisitions. About *quality* effect, despite the possibility of paying higher wages for labor, FDI could also introduce practices considered undesirable as well. From the *location* aspect, FDI could add new jobs for areas with high-unemployment rates, but also possibly crowd urban areas and worsen regional imbalances. In this research, we will consider the comprehensive impacts of FDI on employment from the three perspectives.

Quantity effect: Under the perspective of traditional trade theory, MacDougall (1960) has proved that investment originating from foreign countries helped to increase the output of recipient countries. The increase in the output of the recipient countries, or in other words, economic growth can have a positive impact on job creation in OECD countries (Bassanini and Duval, 2009; Döpke, 2001). To use static analysis, this theory has drastic assumptions related to taxation, the labor force, and some other conditions of the economy. The effects of foreign capital on employment of host countries are illustrated in Figure 1.

In Figure 1, line GK associates the physical capital stock with the marginal product of capital. Initially, the capital stock is AC, of which AB is owned by the host country

and BC by foreigners. Total profits are FEBA on the host country capital and EDCB on foreign capital. The total output of the country is GDCA, and labor gets GDF. Suppose a slight increase in foreign capital from BC to BL. Foreign profits become IKLB. The new foreign capital earns JKLC, and the "old" foreign capital loses EDJI. Therefore, as we argued above, the increase in total output leads to a rise in the number of employment opportunities.



Source: MacDougall (1960)

Figure 1. The Effects of Foreign Capital on Employment of Host Countries

After MacDougall (1960), many economists supported the positive effect of FDI on employment from the quantity perspective. Coniglio et al. (2015), Peluffo (2015), Karlsson et al. (2009) and Waldkirch et al. (2009) in their studies found that the appearance of foreign firms leads to higher employment. Karlsson et al. (2009) proved the employment of labors of MNEs as they set up new affiliates or industries in host countries. In addition, employment could further get higher as the links with domestic firms of those affiliates are built up. For example, when foreign firms buy locally produced goods, demand for upstream firms could increase, which leads to potential job creation in host countries Jude and Silaghi, 2016. Moreover, Lipsey et al. (2010) in their study explored the positive relationship between foreign ownership and employment in Indonesia. FDI can also lead to increased volume of employment through spurring

forward and backward linkages (Golejewska, 2002; Ernst, 2005; Lin et al., 2009).

On the other hand, there is evidence that FDI also has *negative effect*s on host economies' employment (Jenkins, 2006; Rama, 2003). FDI may crowd out non-competitive local firms, leading to job losses for host economies. According to Jenkins (2006), the reduction in volume of employment may also be associated with FDI involving the acquisition of local firms and application of labor-saving technologies. Moreover, as multinationals are footloose and able to relocate production and employment between their affiliates in different countries, jobs created are likely to be highly unstable. Similarly, using matched employer-employee data, Almeida (2007) corroborated that an increase in employment following foreign acquisition in Portugal.

Moreover, there have been empirical studies which present different results. Peluffo (2015) argued that the employment effect of FDI has not been distributed evenly across several types of employees in host developing countries. The explanation is that since the technologies of MNEs are highly skilled-complementary in nature, they tend to influence the generation of high-skilled employees, not low-skilled or unskilled ones. In the study of Central and Eastern European countries (CEEC), Jude and Silaghi (2016) discovered a phenomenon of creative destruction due to FDI. They found that the introduction of labor-saving technologies by foreign firms has led to a negative effect on employment, while the progressive vertical integration of FDI into the domestic economy eventually brought about a positive long run effect. Prior to the study of Jude and Silaghi, Onaran and Stockhammer (2008) in a study of 8 CEEC found an overall insignificant effect of FDI on employment.

Quality effect: Concerning the quality effects of FDI, the quality of employment also can be seen through static analysis in Diagram 1. Foreign capital helps to increase the wages of labor. The process which raises wages derives from labor's higher marginal productivity (MacDougall, 1960). As a result, from the general point of view, the boost in wages is understood to reflect the change in employment quality. There have been empirical studies investigating this effect, however, the findings are also ambiguous. Lipsey and Sjoholm (2001) presented that FDI leads to the increase in the demand for skilled labor and raises the average wage level of host countries. The higher wage, the better signals for the upgrading labor skill. As a result, the boost in the wage is considered as a proxy for improved labor skill, or the quality effect of employment. In their research, Saucedo et al. (2020) did find out that FDI inflows to the manufacturing industry increase marginally low-skilled wages, but no statistical effect is captured in high-skilled wages. Feenstra and Hanson (1997) in their previous study about Mexico for the period of 1975-1988 found that FDI growth leads to the rise of demand for skilled labors, which is positively correlated with wages in regions where FDI flows into. Meanwhile, Waldkirch (2010) suggested that wages may be negatively affected by FDI, particularly in maquiladoras, because large FDI tends to reduce wages of skilled laborers.

Besides, empirical evidence from some studies suggested that foreign firms pay higher wages than their domestic counterparts across host countries, industries, and

regions (Görg et al., 2007). The average wages paid by foreign establishments are from 6 to 22% higher in the United States (Feliciano and Lipsey, 2006; Lipsey, 1994) and 4-26% higher in the United Kingdom (Conyon et al., 2002; Driffield and Girma, 2003; Girma et al., 2001). In Indonesia, the average wage in foreign plants is about 50% higher than in private local plants and 60% higher (including other types of labor compensation, such as bonuses, gifts, social security, insurances, and pensions) (Lipsey and Sjöholm, 2004). In Venezuela and Mexico, wages in foreign-owned manufacturing establishments are higher than in domestically owned establishments by 30% (Aitken et al., 1996). Whilst wage gap estimates between foreign and domestic firms are consistent across existing literature, the explanations for such results are varied. One common reasoning is that foreign investors pay higher wages to reduce worker turnover and thus, to minimize the risk of technology and knowledge diffusion through labor mobility (Fosfuri et al., 2001; Glass and Saggi, 2002; Aitken et al., 1996; Balsvik, 2011; Poole, 2013). Other authors have argued that multinational enterprises offer higher wages to compensate for the possible disadvantages of employment in an MNE, for example, greater pressure and labor demand volatility (Görg and Strobl, 2003), or higher foreign plant closure rate (Javorcik, 2015). Another motivation for higher wages paid by foreign affiliates can also be explained via rent-sharing across international borders (Budd and Slaughter, 2004) and between employers and employees (Budd et al., 2005).

Location effect: UNCTAD (1994) did also clarify the positive location effect of employment of FDI, which comes from the possibility of new job creation in areas with high unemployment. However, the organization also showed that FDI could crowd the already congested urban areas and worsen regional imbalances, which is a negative effect. Furthermore, this location effect could be analyzed from the aspect of labor mobility from one region to the others which have attracted a large amount of FDI. Analyzing a sample of 161 countries and regions by applying gravity model, Paniagua and Sapena (2014) found out that FDI inflows promoted regional labor mobility in underdeveloped countries and regions.

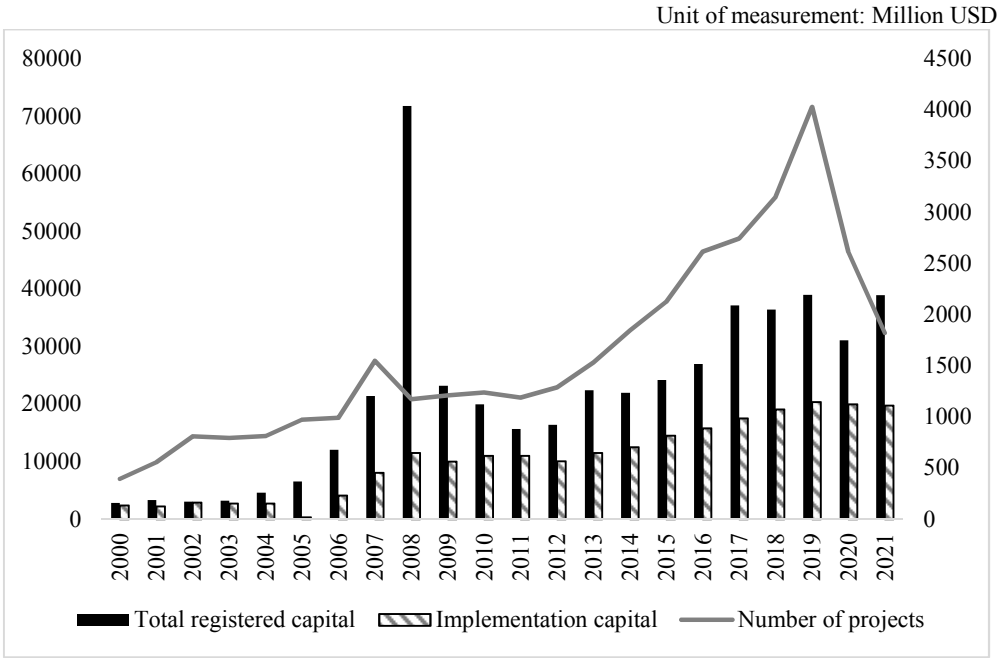
For Vietnam, in our perception, there have been no research looking at these comprehensive perspectives of quantity, quality, and location for Vietnamese firm-level enterprises. In addition, the findings regarding the impacts of FDI on employment (if available) are still also ambiguous and most of them are obtained by using aggregate data, either of country or, industry or province-level, but not firm-level. According to Jenkins (2006), despite the rapid growth of FDI, the employment effect of that financial flow was limited. One of the explanations is that most of the country's labor force still works in the agricultural industry. In their recent research, Nguyen et al. (2020), as using the panel data of all 63 provinces in the 2011-2015 period, did find out the adverse effects of FDI on demand for both aggregate employment and skilled labor in Vietnam. Interestingly, the absolute magnitude of the effect on employment of skilled labor is larger than that of aggregate employment. In addition, the effects are positive in both the services and industry industries, meanwhile those are negative in the agriculture industry. The study of Dao (2020) from 2006 to 2014 investigated the effects of FDI on

employment creation and discovered that the FDI-invested industry has a higher employment creation capability than the domestic one.

3. STYLIZED FACTS OF FDI AND EMPLOYMENT IN VIETNAM

3.1. FDI in Vietnam

Vietnam has seen an increasing trend in the total registered and implemented FDI from 2000 to 2021. From Figure 1, during the period from 2000 to 2005, the amounts of FDI were still at low levels. After that, from 2006, as Vietnam prepared for the participation and then became a member of World Trade Organization, the values of both registered and implemented FDI continued increasing. There was a peak of registered capital in 2008 of more than 7 USD billion which was triple the amount in the prior year. The peak in 2008 was followed by a sharp drop of registered capital in 2009 at around 2.3 USD billion, and this amount continued falling in the next 2 years and then rose gradually until 2016.



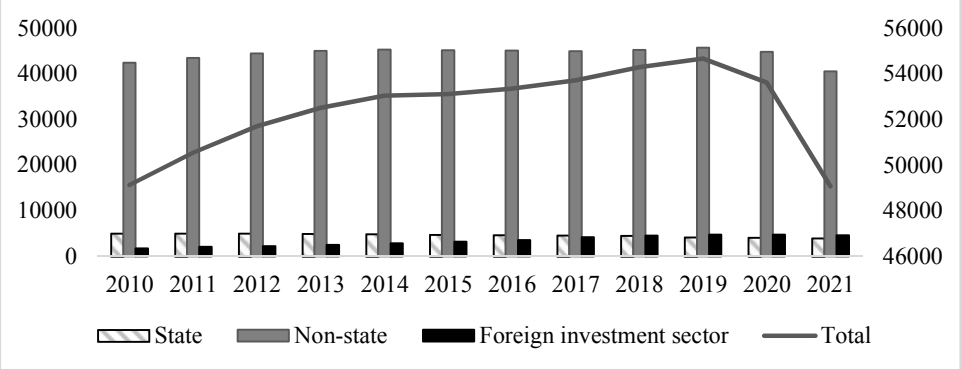
Sources: Author's calculation from General Statistics Office's Statistical Yearbook of Viet Nam 2021. (*) Including new registered capital and supplementary capital to licensed projects in previous years.

Figure 1. FDI in Viet Nam from 2000-2021

In 2017, there was a sharp increase in total registered capital by about 1 billion USD compared to the previous year, and this total amount remained relatively unchanged in 2018 and 2019. Implemented FDI saw a stable increase from 2009 to 2019 with a slight drop in 2012. In 2020, under the impact of the Global Covid-19 Pandemic, FDI inflows went down significantly. The total capital by foreign investors fell to 31 billion USD, which is a 12.8% reduction from that in 2019. The number of projects reduced in comparison with the previous year. As the pandemic was under better control, the outlook for FDI inflows would be positive in the following years. In 2021, with the recovery of the economy, FDI inflows into Vietnam has increased to around 38 USD billion, which approximately equals to the amount in pre-pandemic period.

FDI inflows concentrated on certain industries and provinces and mainly came from specific home countries. Firstly, by the end of 2020, there had been specific prominent industries that were attractive to foreign investors. Those leading industries included Manufacturing (total registered capital of 228,547.9 million USD), Real estate activities (60,320.3 million USD), Electricity, gas, steam, and air conditioning supply (28,641.0 million USD). Secondly, in terms of location choices, foreign investors often directed their capital flows into some provinces such as Ho Chi Minh city, Ba Ria - Vung Tau, Dong Nai, Binh Duong, etc. Finally, among all countries invested in Viet Nam, most of the leading investors came from the Asian region. Until the end of 2020, the Republic of Korea has had the highest number of licensed projects (8,950) and registered capital (70,442.3 million USD), followed by Japan. Interestingly, in the case of China, even though it invested in 3134 projects in Viet Nam and became the top three countries with the most licensed projects, its total capital was relatively small in comparison to that of other countries and only ranked 7th by the end of 2020.

3.2. Employment in Vietnam



Sources: Author's calculation from General Statistics Office's Statistical Yearbooks of Viet Nam

Figure 2. Employed Population at 15 Years of Age and Above by Types of Ownerships from 2010 to 2020

The overall employed population in Viet Nam gradually increased from 2010 to 2021. During that time, it was noticeable that employment in FDI industry witnessed the most substantial rise from 1,729.2 thousand in 2010 to 4,586.3 thousand people in 2021, which highlighted its importance in the labor market by accounting for a larger employment share. Specifically, from 2010 to 2020, the percentage of the workforce in the FDI industry over the total workforce went up by 5.3% while that of state and non-state industries reduced by 2.6% respectively.

4. EMPIRICAL STRATEGIES

Based on the comprehensive look of UNCTAD (1994) of the impact of FDI on employment into three perspectives, namely the quantity, quality, and location effect, we would construct the general specification for our model as follow:

$$\ln emp_{ijnt} = \alpha_i + \beta_1 FDI_{ijnt} + \beta_2 Capital_{intensity_{ijntt}} + \beta_3 Size_{ijnt} + \delta_k D + \varepsilon_{it}, \quad (1)$$

where i denotes firm i; j denotes industry j; n denotes province n; t denotes year t.

The dependent variable: $\ln employment_{ijnt}$ could be one of the following variables: $\ln emp_{ijnt}$ denotes the natural logarithm of total labor in a firm i of industry j in province n in year t[1] (for Quantity effect); $\ln wage_{ijnt}$ regards the natural logarithm of the total wage paid to labor divided by the number of labors in a firm i of industry j in province n in year t[2] (for Quality effect); $\ln province\_em_{nt}$ denotes the natural logarithm of the total aggregated firm-level workers within province n in year t (for Location effect).

The independent variable: FDI_{ijnt} could be proxied by one of two variables: $dFDI_{ijnt}$ is a dummy variable which is one if firm i from industry j, province n in year t receives FDI or not[3]; $FDIpercent_{ijnt}$ is measured as the proportion of FDI in total charter capital of firm i from industry j, province n in year t[4];

Coefficient β_1 is of our interest, which represents the effect of FDI on each of the employment effects (namely, quantity, quality, and location).

Control variables: $Capital\_intensity_{ijnt}$ is measured as the value of fixed asset, net depreciation, divided by number of labor (in accordance with D.T.H. Nguyen et al.,

[1] Similar to Bandick and Karpaty (2011); Coniglio et al. (2015)

[2] Similar to Lipsey and Sjöholm (2004); Onaran and Stockhammer (2008)

[3] Supported by Feliciano and Lipsey (2006); Lipsey and Sjöholm (2004); Bandick and Karpaty (2011)

[4] Supported by Haile et al. (2017); Hale and Long (2011)

2019; Tomohara and Takii, 2011) of firm i from industry j, province n in year t[5]; $Size_{ijnt}$ is measured as total net revenue of goods and services activities of firm i (from industry j, province n in year t) compared to average net revenue of industry j in year t (in accordance with Aitken et al., 1996)[6];

D: dummies for year, industry, and province to control for possible unobservable differences across these dimensions.

We apply the fixed effect technique for the panel data as it comes with a realistic assumption that the regressors are endogenous and handle it by eliminating unobservable time-invariant factors across all firms (This makes the estimations better than what obtains from the random effect and pooled Ordinary Least Squares).[7]

5. DATA

Table 1. Summary Statistics of Variables

	Observation	Mean	St. d	Min	Max
dFDI	1,367,797	0.027	0.162	0.000	0
FDIpercent	1,367,797	2.567	15.617	0	0
ln_emp	1,367,797	1.766	1.238	0	1.099
ln_female_lab	1,123,377	0.975	1.166	0	0
ln_wage	1,363,065	4.235	0.667	0.916	3.942
ln_province_emp	1,367,797	12.405	1.877	0	11.096
capital_intensity	1,367,797	101.943	196.472	0	0
Size	1,367,797	1.128	18.694	0	0.006

[5] As foreign firms tend to have higher level of capital intensity thanks to their owned technologies, they can lower cost structure and thus recruit more employees with higher remuneration packages (T. Q. Nguyen et al., 2020)

[6] Firms with larger size tend to pay higher wage to employees due to their generous compensation policies. Particularly, in Manufacturing industry, foreign-owned plants generally offer higher pay than domestic-owned ones (Lipsey and Sjöholm, 2004).

[7] In addition, we also adopt the System Generalized Methods of Moments (S-GMM) for robustness to see if our results are consistent or not. S-GMM could control for possible endogenous problems arising from simultaneous causality Blundell and Bond, 1998. For example, the problem could occur when higher local wages could be an important contributor to attracting FDI (Cheng and Kwan, 2000; Villaverde and Maza, 2015). SGMM model does not include the time, industry, and province fixed effect, because it is part of the error terms, and this model assumes that the chosen instruments are uncorrelated with the unobserved fixed effects. However, this is a weakness of the SGMM model.

We use rich firm-level panel data for a three-year period from 2017 to 2019. The data was obtained from comprehensive surveys conducted by the General Statistics Office of Vietnam collecting information of Vietnamese firms (more than 1.3 million observations across 63 provinces in Viet Nam and 21 industries) (See Table A1, Appendix for details). Table 1 displays the summary statistics of the main variables. The correlation matrix is presented in Table A2. As all correlations between variables are below 0.34, we can ignore the problem of multicollinearity in our model.

6. RESULTS

6.1. Baseline Results for the Effect of FDI on Employment

Table (2), (3) and (4) represent the baseline results of quantity, quality, and location effect of FDI on employment respectively, using fixed effect[8].

6.1.1. Quantity Effect of FDI on Employment

From Table 2, the coefficients of both $dFDI$ and $FDIpercent$ are positive and statistically significant at 1% level for both cases of using fixed effect and S-GMM. This means that FDI invested firms employ more workers than domestic ones.

The coefficient of $FDIpercent$ in the fixed effect model is 0.006 meaning that as FDI increases by 1%, the number of employed labors rises by 0.6%. This finding affirms that FDI inflows into Vietnam does not result in negative consequences due to the phenomenon of acquisition which results in rationalization and job loss. Rather, FDI inflows make the situation of employment better by offering more employment opportunities to laborers of the host country. This finding also supports the positive impact of FDI on the number of employed labors as proved in the study of Karlsson et al. (2009), Lipsey et al. (2010), and Bandick and Karpaty (2007).

Regarding the control variables, $capital\_intensity$ has a negative and statistically significant relationship with employment for both fixed effect and S-GMM. This means that the more capital-intensive firms are, the less labor firms hire. Indeed, as firms have higher levels of capital intensity, they will need less labor. In terms of $size$, the coefficients are positive and statistically significant in all cases, showing that firms with bigger size employ more labor. Indeed, firms need a bigger pool of labor to serve their operation as it expands (FitzRoy, 1989).

6.1.2. Quality Effect of FDI on Employment

[8] S-GMM is also applied for robustness check.

Table 2. Results of the Quantity Effect of FDI on Employment in Vietnam

	Quantity effect (ln*emp*)							
	Fixed effects		GMM		Fixed effects		GMM	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
dFDI	0.229***	0.227***	1.024***	1.010***				
	(0.022)	(0.022)	(0.017)	(0.017)				
FDIpercent					0.006***	0.006***	0.010***	0.010***
					(0.000)	(0.000)	(0.000)	(0.000)
capital_intensity	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
size		0.002***		0.002***		0.002***		0.002***
		(0.001)		(0.000)		(0.001)		(0.000)
Observations	1,367,995	1,367,797	1,367,995	1,367,797	1,367,995	1,367,797	1,367,995	1,367,797

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dummies for industry, year and province are also controlled.

Table 3. Results of the Quality Effect of FDI on Employment in Vietnam

	Quanlity effect (ln*wage*)							
	Fixed effects		GMM		Fixed effects		GMM	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
dFDI	0.139***	0.139***	1.466***	1.454***				
	(0.017)	(0.017)	(0.016)	(0.016)				
FDIpercent					0.003***	0.003***	0.023***	0.023***
					(0.000)	(0.000)	(0.000)	(0.000)
capital_intensity	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
size		0.000**		0.002***		0.000**		0.002***
		(0.000)		(0.000)		(0.000)		(0.000)
Observations	1,363,261	1,363,065	1,363,261	1,363,065	1,363,261	1,363,065	1,363,261	1,363,065

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dummies for industry, year and province are also controlled.

According to Table 3, the coefficients of interest for $dFDI$ and $FDIpercent$ in all cases are positive and statistically significant at 1% level. Columns (5) and (6) show that as the share of FDI in total charter capital increases by 1%, wages will go up by 0.3%. This result aligns with the explanation of Harrison (1994) which also indicates the benefits of FDI in helping raise the income of labor not only in developing countries. In addition, MNCs often have higher budgets to attract or sustain high-skilled laborers. In certain cases, enterprises also possibly would like to have good brand images when implementing Corporate Social Responsibility with their employees via good remuneration policies.

Regarding the control variables, despite being low, the coefficients of $capital\_intensity$ are still positive and statistically significant, which means the more capital-intensive firms are, the higher wages their workers would receive. This finding is consistent with earlier literature, where the authors found that higher capital intensity implies lower share of labor cost in a firm's cost structure, and thereby would reduce firm's resistance to high wage demand compared to the case when labor cost make up large part of total cost. In terms of *size*, the positive and statistically significant coefficients present that as firms have bigger size, they tend to pay higher wage employees. Compared to small firms, larger firms have more financial capabilities and clear compensation policies, enabling them to pay higher wages (Pittiglio et al., 2015; Villarreal and Sakamoto, 2011; Nguyen et al., 2020).

6.1.3. Location Effect of FDI on Employment

The results of the effect of FDI on province-level employment (location effect), are presented in Table 4. The coefficients of interest for both $dFDI$ and $FDIpercent$ are all negative and statistically significant for both cases of using fixed effect and SGMM. This is with consistent the potential location effect of inward FDI proposed by UNCTAD (1994), which shown that foreign-owned firms with advanced technology would replace local firms and thus contribute to regional unemployment. From Columns (5) and (6), as FDI in a province rises by 1%, the number of labors of that province goes down by 0.1%.

Meanwhile, coefficients of $capital\_intensity$ are negative. This means that as firms in a province become more capital intensive, local employment would fall. This might be explained that capital intensive firms tend to get high market concentration (Arai, 2003), which would result in the destruction of other firms and thereby adding to local unemployment. Regarding the $size$, the negative coefficients imply that that as firms in a province grow larger in size, it would reduce local employment. An explanation could be that larger firms tend to outperform and replace smaller ones, and in turn, crowd out local employment.

6.2. Further Results for the Effect of FDI on Employment

Table 4. Results of the Location Effect of FDI on employment in Vietnam

	Local effect (ln$province_em$)							
	Fixed effects		GMM		Fixed effects		GMM	
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
dFDI	-0.100***	-0.100***	-0.805***	-0.795***				
	(0.028)	(0.028)	(0.034)	(0.034)				
FDIpercent					-0.001***	-0.001***	-0.008***	-0.008***
					(0.000)	(0.000)	(0.000)	(0.000)
capital_intensity	-0.000	-0.000	-0.001***	-0.001***	-0.000	-0.000	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
size		-0.000		-0.002***		-0.000		-0.002***
		(0.000)		(0.000)		(0.000)		(0.000)
Observations	1,367,995	1,367,797	1,367,995	1,367,797	1,367,995	1,367,797	1,367,995	1,367,797

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dummies for industry, year and province are also controlled.

In this section, we would like to further discover the effects of FDI on employment across four key industries (with the most observations in 3-year period from 2017 to 2019) and between distinct types of FDI firms in Vietnam. In part a, we investigate the impacts across four industries, which are Manufacturing (Industry C); Construction (F); Wholesale and retail trade; repair of motor vehicles and motorcycles (G); Professional, scientific, and technical activities (M) (Table A3, A4 and A5). In part b, we consider two types of firms with 100% FDI-invested firms and joint ventures (Table A6).

6.2.1. The Effect of FDI on Employment by Key Industries

From Table A3, the *quantity effects* of FDI are varied across industries. While the effects are significantly positive for Manufacturing (Industry C) (with the highest magnitude), Wholesale and retail trade; repair of motor vehicles and motorcycles (G) and Professional, scientific, and technical activities (M), that is insignificant for Construction (F). In previous studies, Lipsey et al. (2010) and Lipsey and Sjöholm (2004) also found that foreign plants typically generate more employment than domestic-owned plants in the Manufacturing industry. Regarding the Professional, scientific, and technical activities, the positive effect is also consistent with the context of Poland where knowledge-intensive industries tend to offer employment among graduates (Micek et al., 2011; Galgóczi et al., 2015). Regarding the *quality effect*, Table A4 presents an interesting result which proves for the role of FDI on the significant rise in the wage of labors in the industries of Construction (F) and Wholesale and retail trade; repair of motor vehicles and motorcycles (G). *The location effect* presented in Table A5 appears to be statistically significant and negative for just the industry of Manufacturing (C). An explanation could be that since FDI makes notable change in such industry in terms of bringing in new and advanced technology, firms would outperform outdated domestics ones in the locality and crowd out employment in provinces.

6.2.2. The Effect of FDI on Employment by Types of FDI Firms

In this section, we analyze whether two types of FDI, namely those with 100% FDI and joint ventures differ in terms of quality, quantity, and location effect. From Table A6, we saw that the quality, quantity, and location effect of FDI is clearer for 100% FDI-invested firms compared to joint ventures. Specifically, in terms of *quantity effect*, 100% FDI-invested firms hire more labor compared to domestic ones, while the number of employed workers in joint ventures and domestic ones are insignificantly different. In terms of *quality effect*, both 100% FDI invested firms and joint ventures pay higher wages than the domestic ones, but at different levels. Labors in 100% FDI-invested firms receive a higher level of rise in wage than that in joint ventures. Regarding *location effect*, the coefficients of interest are significantly negative. Firms with 100% FDI would lead to more reduction in province employment than the case of joint ventures. These findings are consistent with earlier ones, where they show firms with higher FDI perform better in terms of employment effect than those with less FDI. Specifically, Hale and Long (2011) have shown that the more foreign capital a firm has, the higher average wage it would pay to labor, and Aitken et al. (1996) also share similar findings.

7. CONCLUSION

Applying Fixed effect techniques for a rich information database of Vietnamese firms

with more than 1.3 million observations for a period of 2017-2019 across 63 provinces and 21 industries, we have found interesting results about the comprehensive effects of FDI on employment. Regarding *quantity* effect, FDI indeed helps to raise employment by 0.6% of firms across Vietnam. The rise of FDI also leads to the increase in wage, which supports the positive impact of FDI on employment from the *quality* perspective. Despite more job creation for firms, about the *location* effect for provinces, FDI pouring into a province makes the provincial employment reduce by about 0.1%. These are interesting results which could just be discovered by the advantage of rich firm-level data.

For further results, as looking into 4 key industries with the most observations (Manufacturing; Construction; Wholesale and retail trade; repair of motor vehicles and motorcycles; Professional, scientific, and technical activities), *the quantity effects* occur in almost all industries and the impact is at the highest magnitude for Manufacturing (which obtains the highest value of FDI in Vietnam). However, it is not Manufacturing industry which obtains the rise in wage for labor thanks to FDI, but the other two industries of F and G. These could come from the fact that these two industries recruit more skilled labors as FDI goes up. Regarding the *location effect*, only Manufacturing industry sees the reduction in the employment in a province as that province receives FDI. Considering the types of firms, we found that 100% FDI-invested firms recruit more labors (this effect does not take place for joint-ventures) – *quantity effect* and pay higher wages for labors (this effect is bigger than that for joint-ventures) – *quality effect*. However, it is 100% FDI-invested firms which leads to more reduction in the provincial employment than joint ventures – *location effect*.

APPENDIX

Table A1. The Number of Observations By Industries

Industry	Frequency	Percent	Cumulative	Industry	Frequency	Percent	Cumulative
A	30,070	2.2	2.2	L	34,120	2.49	85.07
B	7,900	0.58	2.78	M	113,042	8.26	93.33
C	216,605	15.83	18.61	N	50,835	3.72	97.05
D	5,111	0.37	18.98	O	5	0	97.05
E	6,336	0.46	19.45	P	18,925	1.38	98.43
F	180,416	13.19	32.63	Q	5,184	0.38	98.81
G	515,400	37.68	70.31	R	6,945	0.51	99.32
H	83,858	6.13	76.44	S	9,329	0.68	100
I	47,341	3.46	79.9	T	17	0	100
J	27,993	2.05	81.95	U	1	0	100
K	8,562	0.63	82.57	Total	1,367,995	100	

Table A2. Correlation Matrix

		1	2	3	4	5	6
1	dFDI	1					
2	ln_emp	0.29	1				
3	ln_wage	0.15	0.1	1			
4	ln_province_emp	0.01	-0.13	0.33	1		
5	capital_intensity	0.08	0.13	0.02	-0.13	1	
6	size	0.06	0.14	0.05	0	0.05	1

Table A3. Results of the Quantity Effect of FDI on Employment in Vietnam's Key Industries

	Quantity effect (lnemp)			
VARIABLES	C	F	G	M
dFDI	0.314***	-0.091	0.184***	0.225***
	(0.046)	(0.079)	(0.046)	(0.073)
capital_intensity	-0.001***	-0.002***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
size	0.004***	0.008***	0.001**	0.004**
	(0.001)	(0.002)	(0.001)	(0.002)
Observations	216,586	180,368	515,341	113,013

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dummies for industry, year and province are also controlled. Industries: C- Manufacturing; F-Construction; G-Wholesale and retail trade; repair of motor vehicles and motorcycles; M- Professional, scientific, and technical activities. Fixed effects have been applied).

Table A4. Results of the Quanlity Effect of FDI on Employment in Vietnam's Key Industries

	Quanlity effect (ln$wage$)			
VARIABLES	C	F	G	M
dFDI	0.003	0.351***	0.286***	0.092
	(0.027)	(0.076)	(0.051)	(0.071)
capital_intensity	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
size	0.001	0.002**	0.000*	0.000
	(0.001)	(0.001)	(0.000)	(0.001)
Observations	216,024	179,795	514,154	112,809

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A5. Results of the Location Effect of FDI on Employment in Vietnam's Key Industries

VARIABLES	**Location effect** (ln$province_em$)			
	C	F	G	M
dFDI	-0.198***	-0.197	-0.041	-0.035
	(0.053)	(0.120)	(0.080)	(0.095)
capital_intensity	-0.000	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
size	-0.000	0.000	-0.000	-0.001
	(0.001)	(0.001)	(0.000)	(0.001)
Observations	216,586	180,368	515,341	113,013

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A6. Results of the Effects of FDI on Different Perspectives of Employment in Vietnam by Types of FDI Firms

VARIABLES	Quantity effect (lnemp)		Quality effect (ln$wage$)		Location effect (ln$province_em$)	
	100%FDI	Joint Venture	100%FDI	Joint Venture	100%FDI	Joint Venture
dFDI	0.311***	0.013	0.308***	0.042**	-0.145***	-0.076**
	(0.030)	(0.018)	(0.021)	(0.019)	(0.035)	(0.036)
capital_intensity	-0.001***	-0.001***	0.000***	0.000***	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
size	0.002***	0.002***	0.000**	0.000**	-0.000	-0.000
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	1,363,150	1,335,591	1,358,423	1,330,895	1,363,150	1,335,591

Notes: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. The dummies for industry, year and province are also controlled.

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Mailing Address: Cao Thi Hong Vinh, Foreign Trade University, 91 Chua Lang Street, Lang Ward, Hanoi, Vietnam, E-mail: caovinhftu@ftu.edu.vn

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