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Article

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The Effect of Institutions on Productivity Spillovers from FDI to Domestic Firms: Evidence in Vietnam

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A B S T R A C T

Purpose: The purpose of this study is to investigate the impact of formal institutions and their components on productivity spillovers from FDI enterprises to domestic firms' TFP in developing countries like Vietnam.
Design/methodology/approach: The study, conducted in two steps to explore the relationship, is to estimate the firm's TFP in accordance with the semi-parametric method of Levisohn and Petrin (2003). Regression is in accordance with the equation with panel data and adjusted by Driscoll and Kraay standard errors. An unbalanced panel data, related to more than 61,600 Vietnamese manufacturing firms from 2012 to 2017, is combined with the Provincial Institutional Quality Survey (PAPI index) and IO table.
Findings: The local institutions have a positive impact on promoting learning ability and increasing productivity of domestic firms, especially small and medium enterprises (SMEs) that take better advantage of this effect. Vertical linkages with FDI enterprises assist local firms to increase productivity while horizontal linkages bring in negative effects. Domestic enterprises with high productivity (in the top 25%) receive positive spillover effects from horizontal linkages and vertical linkages and gain positive impacts of the institution on productivity whereas the group of low-productivity enterprises records negative impacts. This research highlights those enterprises operating in the region where institutions have transparency, accountability, participation in comments and effective corruption control can absorb spillovers and improve their productivity as well as the transparency and corruption control are recognized as having a positive impact through horizontal linkages.
Research limitations/implications: With the limitation of research data being conducted only on manufacturing enterprises, there is a lack of data on the impact of service enterprises. The study only stops at understanding the impact of formal institutional effects on productivity spillovers whereas informal institutional effects will be studied in the future. Furthermore, the productivity spillovers of FDI enterprises are explored in general besides other FDI forms that will have different productivity spillovers like offshore. From the results of this study, the governments of developing countries should improve their institutions to encourage local enterprises to take the advantage of spillover effects from FDI enterprises as well as pay more attention to regional factors by supplementing development priority policies based on the capacity of each region. Institutional quality at provincial level has a positive impact on productivity spillovers; consequently, it is essential to have policies for further institutional improvement.
Originality/value: This is the first research paper on the impact of the institutional factor at provincial level on firm's productivity in developing countries like Vietnam. Theoretically, the impact of formal institutions on spillover effects from FDI enterprises is also clarified. In addition, our findings have implications for local economic development policies: vertical linkages promote domestic firms to increase their productivity while horizontal linkages of FDI enterprises in the same industry generate adverse impacts. This paper suggests some feasible solutions for SMEs in developing countries towards their productivity improvement.

Keywords: Institution region, Foreign direct invest, Spillover, Absorption, Total factor productivity

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I. Introduction

In particular, economic growth has always been regarded as a measure of the prosperity of a country in general and a firm in particular, in which the important role of capital and labor in increasing productivity has been proven by previous studies. Despite the same inputs, the output can be different by improving the quality of labor and science and technology; therefore, the increase in total factor productivity (TFP) is associated with innovation, application of scientific and technical progress, improving management methods and workers' skill levels (Solow, 1956). International trade enables developing countries with resources for imported modern technology machine development and optimization. Due to the fact that foreign direct investment (FDI) is defined as a form of long-term investment in which a foreign entity is involved in the operation and management of a domestic firm, an argument that FDI contributes positively to the development of host countries is presented. Developing countries are interested in FDI due to the direct effects from more capital for economic development as well as indirect effects of FDI that can promote technology transfer to developing countries (Meyer & Sinani, 2009). The spillover effects of FDI on local firms can arise from multinational enterprises (MNEs) both horizontal and vertical linkages. Similarly, vertical linkages (e.g., customer or supplier relationships with MNEs) provide (1) demonstration effect (2) labor transfer from MNEs to domestic firms or start-ups and (3) most by common mechanisms through which FDI spillovers affect productivity (Saggi, 2004). In addition, knowledge and skills of managers or workers are improved, which helps to enhance efficiency and productivity in production through possessing better production technology, management skills, export contacts, reputation, and goodwill. FDI can encourage local firms to strive in a highly competitive environment and boost demand from domestic firms (Aitken & Harrison, 1999). However, all of these effects depend on the quality of institutions in host countries as these institutions shape both commercial and market relationships between foreign and domestic firms, leading to the indirect effects on the range of potential spillovers (Krammer, 2015). In according with Douglas North's theory, institutions are rules of the games so as to regulate and shape human interactions. Institutions create both barriers and opportunities for FDI since institutional differences between the host country and the registered country of investment firms influence a multitude of microeconomic decisions, listed as market entry methods, payroll and alliances among enterprises (Xu & Shenkar, 2002). Economic growth is intrinsically related to institutions, encouraging new technology application for economic efficiency promotion (Tebaldi & Elmslie, 2008). All of these results reveal important direct and indirect effects of institutions on both productivity and economic growth. Therefore, the fact that institutional aspect is a strong predictor of the intensity and the type of international business activities in a country (Henisz & Swaminathan, 2008) determines potential benefits from spillovers through international trade and FDI.

Vietnam has made great strides upon its progress towards economic transformation, in which the institutional quality of its economic transition is particularly impressive after the 6th National Congress of the Communist Party of Vietnam in 1986 with the "Doi Moi" policy. After the dissolution of the Soviet Union, the Vietnamese economy has started to develop the foundation in the socialist direction. That the previous studies support an argument that local governance is significantly important in institutional settings that are less supportive of entrepreneurship means that business performance can be affected by the existence of traditional corporate culture (Makino & Tsang, 2011). The quality of governance has become more important in case of the compensation necessity for the lack of business culture and productivity spillovers.

Major contributions in accordance with the following literature are proposed as follows. First, defining the role of institutions is important when studying FDI spillovers in emerging economies, in which institutions are too complex with rapid changes in a dynamic area like South East Asia. Second, regions within

a given country may differ significantly in institutional settings, however, the previous studies on FDI determinants focused only on national-level institutions with states that institutions are homogeneous among regions within a country (Krammer, 2015). Ignoring consideration of local impacts may not be totally important for recipient countries with relatively homogeneous local institutions. However, these effects may be of much greater importance for the recipient countries whose institutions are not heterogeneous among regions. In fact, very few studies have discussed how regional institutional characteristics shape the way in which FDI firms affect TFP of local firms in the same region while the previous studies partially provide documents and insights on the phenomena of FDI spillovers in the region. In short, this paper examines how regional institutional dimensions affect local firms' TFP through absorptive capacity with the effects of FDI firms.

The subsequent section of this paper encompasses the following sections: Section 2 presents literature review; Section 3 concentrates on methodology and data; Section 4 explains the results obtained from the data processing by the selected model; Section 5 proposes conclusions and recommendations on various related policies.

II. Literature Review

A. FDI and Productivity Spillovers

As analyzed, FDI does have spillovers effects on domestic firms' productivity through vertical and horizontal linkage. Horizontal spillovers refer to the knowledge spillovers within an industry due to the presence of MNEs in the same industry. The market entry of MNEs can provide technology outsourcing to local firms through a few mechanisms. First, domestic enterprises can learn by observing and imitating product innovations or new forms of organization that are appropriate to local conditions (Blomström & Kokko, 1998). Besides that, local firms can learn from FDI's products and process by innovating or working closely with foreign firms. In this case, demonstration effect depends upon the degree of similarity of goods and the proximity of business partnership (Barrios & Strobl, 2002; Meyer & Sinani, 2009). Second, a noticeable mechanism of technology spillovers in the same industry is labor mobility, which can diffuse from MNEs to other enterprises with trained or employed staff by MNEs move to domestic firms or start their own business. The fact that MNEs' employees can learn and accumulate knowledge and skills at work with dedicated efforts to staff training is crucial for firms that are in lack of technological capacity and management skills in a highly competitive global market (Glass & Saggi 2002; Meyer, 2003; Meyer & Sinani, 2009). Third, technology spillovers derive from competition due to the presence of MNEs. If MNEs have more advantages over local firms in technology, the greater competitive pressure can lead local firms to the introduction of new products or new technology to maintain their market share and apply new management methods to increase productivity (Blomström & Kokko 1998). However, MNEs may impact negatively on domestic firms as they may be overly demanding on local firms, causing the enforcing domestic firms to reduce output and productivity (Aitken & Harrison, 1999). This situation mainly occurs in developing countries where domestic firms often lack competitive capabilities to foreign firms (Meyer & Sinani, 2009; Le & Pomfret, 2011).

Technology spillovers occur through backward linkages through a number of mechanisms (from buyers to suppliers) (Blalock & Gertler 2008; Blalock & Simon 2009, Javorcik, 2004). First, local suppliers are beneficial from the presence of MNEs as it expands demand for their input products of domestic firms. Second, it is possible that MNEs support their local partners to meet high-quality standards by providing technical support and personnel training to increase product quality of the suppliers. Higher demands on product quality and punctual delivery set by MNEs can encourage local suppliers to improve their production processes or technology. Third, it is assumed that the close relationship between MNEs

and local suppliers may result in labor mobility from MNEs to local suppliers, leading to disseminating technology from MNEs (Javorcik, 2004).

Although numerous empirical studies regarding spillovers from FDI to domestic sector have been performed, the results are not similar. Differences are revealed upon conducting research in terms of economies as well as groups of developed and developing countries. These researches on developed countries show a lot of differences, most of which have not showed significant effects between FDI and domestic firms (Meyer & Sinani, 2009). Specifically, in terms of the industry data (Driffield, 2001) and the firm level data (Girma, 2005; Imbriani et al., 2014), no impact was displayed. On the other hand, some studies have pointed out the positive effects from horizontal linkages to backward linkages (Liu et al., 2000; Haskel et al., 2001; Görg & Strobl, 2003; Tanaka, 2015) whereas forward linkages have a negative impact on productivity. Most studies in developing countries indicate positive spillover effects with industry data (Blomström & Wolf, 1994; Kokko, Tasini & Zenia, 1996) or even with firm level data (Blomström & Sjöholm, 1999; Kokko et al., 2001; Görg & Strobl, 2001). Some studies specify no spillover significant effects on productivity (Kathuria, 2000; Kugler, 2006) while others prove positive effects on a linkage but a negative one on the other (Javocirk, 2004).

In the case of Vietnam as one developing country, the study of spillover effects based on the data from an annual enterprise survey of the General Statistics Office (GSO) has attracted much attention from experts, in which, the above impacts are examnied under multi-angles. Initially, Thuy (2005) with Vietnam's industry, affirms the positive impact of FDI on the domestic industry. Le & Pomfret (2011) argued that backward linkages make an important impact on domestic firms' productivity while horizontal linkages are negative effects. Recent studies focus on analyzing spillover effects influenced by geographical factors. Anwar and Nguyen (2014) present positive spillover effects on domestic firms' TFP because of the horizontal linkages with four out of six economic regions of the Red River Delta, South Central Coast, Southeast and Delta Mekong River, an area with a good foundation in infrastructure, human resources and advanced technology. The results verified by Huynh et al., (2019) also indicate that backward linkages have a positive impact on the productivity of domestic firms while horizontal and forward linkages leave negative effects. Moreover, enterprises are more effective when located within 100 km^2 with a large number of FDI enterprises. Ni et al., (2017), with insights about the effects of original FDI nationality, suggest that horizontal linkages affect negatively on domestic firms' TFP whereas backward linkages, depending on the partner, have positive effects. These effects are possibly obtained from FDIs in Southeast Asia, Taiwan, in contrast to those in other countries listed as Japan, Korea, North America and Europe.

The difference in empirical results can be explained by different characteristics of the host country. Some studies demonstrate that it is due to technological gap between local firms and FDI or the delay of new technology adoption. Another hypothesis states that the difference is due to the absorptive capacity of domestic enterprises. They need a certain degree of absorption, which proves that the distance is not too far, compared to other firms in the same region so as to benefit from high-technology enterprises (Meyer & Sinani, 2009).

B. Institutional impact on the spillovers of the FDI sector to the domestic sector

First, one eminent representatives of 'neo-institutional economics' theories is that of Douglass. In accordance with C. North (1990), institutions are rules of the game, which are man-made constraints to regulate and shape our interactions. The main role of institutions in a society is to reduce uncertainty by providing a regulatory structure for activities of daily life (North, 1990). Williamson (2000) consider that governance institutions through laws, policy and market institutions or the micro level, each institutional level has a different impact on economic growth. Institutions

also influence the choice of input modes by reducing the switching costs of the alternative institutions (Meyer & Nguyen, 2005; Peng et al., 2008; Kramer, 2015). The fact that attracting FDI may encourage foreign investors to enter joint ventures with local firms does create more spillover effects than subsidiaries due to a stronger interaction with local factors. Foreign investment enhances competitiveness and penetrates the industry by increasing the number of competitors and through the introduction of a competitive way (Blomström & Kokko, 2003). Knowledge spillovers from FDI enterprises to domestic firms are argued through both vertical and horizontal linkages.

Second, that institutional effects increase competition improves productivity of domestic firms. When market institutions are underdeveloped, local firms can gain benefits from preferential access to key (public sector) clients and solid local business networks, this reduces the motivation to compete with foreign investors. As the economy becomes more competitive and formal market support institutions are gradually expanded, local firms have to adapt their strategies to deal with challenges so as to improve their advantage to survive in the market (Peng, 2003). Pressure from big players with more experiences and customers in the market causes domestic firms to change their strategy. It is argued that large firms are more experienced and inert with complex structures whereas small enterprises tend to be younger, more flexible with fewer resources and may be more interested in deep restructuring. The fact that the presence of new foreign firms contributes to improved institutionalization as the transition takes place, startups and foreign participants gradually become central players affirms their standards in the organizational sphere and turns market-based competition into new institutionalization modes (Peng, 2003). An important aspect of the institutional framework is international trade liberalization which enhances both opportunities and incentives for innovation (Saggi et al., 2004). Institutional quality is directly tied to innovation, affecting both productivity and the added value of economic activities. A prime example of these effects is the role of strong intellectual property rights (IPR) (Krammer, 2015). Therefore, institutions have a significant impact on technology transfer and improve the productivity and efficiency obtained by creating efficient technology transfer (Tihanyi & Roath, 2002). In addition, that better institutions facilitate increasing FDI inflows as well as international cooperation enhances competitiveness in the domestic market stimulates enterprises to conduct more researches and development or to acquire technologies from foreign firms to successfully compete in the domestic market. The biggest impact is productivity enhancement for domestic firms and that of the host countries (Amendolagine et al., 2013, Krammer, 2015; Xiao et al., 2018).

Recent studies have shown that institutional environment of the host country is important for not only FDI strategies listed as site selection and accession process (Peng et al., 2008; Meyer et al., 2009; Amendolagine et al., 2013) but also firm performance and spillovers (Meyer & Sinani 2009). Amendolagine et al., (2013), studying 19 sub-Saharan countries, Africa on institutional quality and FDI enterprises' participation, stated that good institution, especially a credible legal system, is the premise for fostering linkages created by foreign enterprises. Krammer (2015) demonstrates that institutional quality controls the impact of foreign technology through spillover effects on productivity. However, the different impacts between institutional factors and countries need to be considered. The institutions that regulate business environment (listed as: the ease of doing business) appears to interact positively with both trade and spillover effects of FDI in determining productivity levels. Recent studies also identify the importance of local institutions towards business performance and international business, especially in emerging economies, in which domestic institutions have significant differences because of uneven economic development and political reforms between regions (Yi et al., 2015; Hong et al., 2016; Xiao et al., 2018; Zang, 2018). In most Chinese researches, local government plays an indispensable role in providing public goods, enforcing laws and implementing policies within their jurisdiction. The interpretation and enforcement of the law varies among regions

although the legal code is unified nationwide. Zhang (2019) examines the impact of institutions on FDI spillovers considering firm heterogeneity and different spillover mechanisms. The study verifies hypotheses by using the data of Chinese manufacturing firms from 1998 to 2013. For companies with highly specific relationships, vertical spillover effects through backward and forward linkages are more significant than in those in regions with better law regulations. Yi et al., (2015) examine the role of sector-specific institutions in explaining the spillovers of FDI with the Chinese business data in the 2005-2007 period, affirming that operating in regions have a higher degree of protection for intellectual property rights with better market development and international openness in order to absorb spillover effects and to improve their productivity.

By demonstrating how location-dependent institutions influence spillover effects of FDI, this article expands the literature of the previous studies which largely focused on firms and industry-specific determinants or the unique characteristics of national institution. Institutions are argued to differ from one region to another in each country and this difference can account for a significant part of the FDI spillovers. Our findings in this study support the premise which suggests that enterprises operating in regions with higher levels of intellectual property protection (IPR), market development and international openness are likely to absorb spillovers and to improve their productivity more effectively. Therefore, this article expands the previous literature on Xiao et al., (2018) using the panel data set of manufacturing firms in China from the 1998-2007 period to identify that the heterogeneous development in the region of the institutional environment significantly affects FDI spillovers on local firms. Local firms in the region with a well-developed institutional environment may reach the top of the inverted-U shape earlier than other firms with a slightly developed institutional environment. In particular, compared to enterprises in some regions with slowly developed institutional environment, local firms in regions with established and developed institutional environment are possible to have less potential and opportunities for technology spillovers learning in the context of FDI spillovers.

Extensive studies exploring the effects of FDI spillovers on the productivity of local firms have provided conflicting evidence. Specially, the important role of changing institutional mechanisms in FDI the spillover effects on domestic firms' productivity is largely ignored. In the context of markets transforming from low to middle income, the market economy institution is gradually shifting to the socialist orientation. The fact that Vietnam has provinces with different level of comprehension when applying the law affects the supporting level towards the local firms (Nguyen et al., 2018).

III. Research Methodology

A. Research Data

In this paper, three datasets are used to explore the relationship between institutions and the spillover effects of FDI firms. Both Viet Nam annual enterprises surveys (VES) and the Viet Nam Provincial Governance and Public Administration Performance Index (PAPI) conducted survey all 63 provinces and cities in Vietnam between 2012 and 2017.

The first dataset is VES collected annually by General Statistics Office of Vietnam (GSO). The survey was first conducted in 2001 with annually updated data collection on production and business activities of enterprises until December 31st, 2000. As a rule, all enterprises in the State sector and the FDI sector are completely investigated, in which non-state enterprises conduct a sample survey as well as the sample frame is determined by territorial and economic sector. At the first stage, the survey selects enterprises with less than 10 new employees in the sample survey group. Nevertheless, the number of small enterprises is currently increasing so the sample enterprises with the number of employees has reached 50 people in some areas like Ha Noi Capital and Ho Chi Minh City. Particularly, in the years of the Economic Census in 2002, 2007, 2012, and 2017 (data collected for

the 2001, 2006, 2011 and 2016 years), all enterprises in the territory are the subjects to information collection. VES is the collection of information regarding assets and sources of capital, investment capital, business activities, budget contribution, labor and performance. The investigation scope includes enterprises from all economics by sub-sectors Vietnam Standard Industrial Classification System and all economic sectors.

The intersectoral balance sheet (IOTs) was prepared by GSO in 2012 to calculate the linkages between 164 economic sectors. The table shows the input factors related to the production technology applied to product development, total capital formation, final consumption, exports and other indicators.

The third one is the PAPI, the largest sociological survey in Vietnam with an assessment of the formulation, implementation and supervision of public policy and service delivery. The content axes are especially designed for both national and local level in Vietnam. PAPI is built on the philosophy of people as 'users' (or 'customers') of public agencies (or 'service providers') with capability of monitoring and evaluating effectiveness of governance and local public administration.

B. Model and Methodology

The study is conducted in two steps to explore the relationship.

From the production equation of the Cobb-Douglass production function

$$Y_{ijpt} = A_{ijpt} (K_{ijpt})^{\alpha} (L_{ijpt})^{\beta} (M_{ijpt})^{\gamma} e^{Z_{ijpt}} \quad (1)$$

$$\text{Ln } (Y_{ijpt}) = \ln (A_{ijpt}) + \alpha \ln (K_{ijpt}) + \beta \ln (L_{ijpt}) + \gamma \ln (M_{ijpt}) + Z_{ijpt}$$

Y_{ijpt} , K_{ijpt} and L_{ijpt}, M_{ijpt} are the output, capital, labor force intermediate raw material inputs of domestic firms i in industry j at time t, respectively. $Aijpt$ represents an element shaped by specific corporate factors and other intangible factors. Logarithm is taken and total factor productivity (TFP) is determined as a measure like the Levinsohn-Petrin method. This semiparametric approach may address the potential endogenous problem.

$Zijpt$ is an exogenous factor to generate and it is explained in more detail below

$$Z_{ijpt} = (Labour\ Quality_{ijpt}, Spillovers_{jpt}, Papi_{ijpt}, Technologygap_{iipt})$$

Step 1. Estimating the firm's TFP according to the semiparametric method of Levisohn and Petrin (2003). The LP method emphasizes that the mediators can respond more smoothly to productivity changes. The natural log of the Cobb-Douglas production function is also taken, resulting in a logarithmic linear production function. Compared with the OLS estimation method, the Olley-Pakes method (1996), this semi-parametric method solves the endogenous problem of estimating TFP when the investment capital is zero (Levisohn & Petrin, 2003).

$$\ln TFP_{ijpt} = \ln Y_{ijpt} - \alpha k_{ijpt} - \beta l_{ijpt} - \gamma m_{ijpt} \quad (2)$$

Step 2. Regression according to equation with panel

Table 1. Means, Standard Deviations, and Correlations of Variables

		Mean	SD	1	2	3	4	5	6	7
1	LnTFP	0.1423	0.0478	1						
2	Labourquality	-0.3167	1.666	0.3033	1					
3	Horizontal	0.1214	0.1619	0.0998	0.1986	1				
4	Vertical	0.1185	0.1638	0.0555	0.0869	0.6768	1			
5	Papi	35.5263	1.7451	0.0558	0.1317	0.0555	0.0293	1		
6	Technologygap	-0.9743	0.26051	-0.1365	0.0107	0.0164	0.0133	0.0131	1	
7	Scale	0.034	0.6161	0.1112	0.056	0.0225	0.0194	-0.001	-0.1255	1

data and adjusted by Driscoll and Kraay (1998). The equation is based on previous research of Krammer (2015); Yi et al., (2105); Hong et al., (2016); Xiao et al., (2018); Zhang (2019). In order to avoid the endogenous factor since FDI enterprises invest in high-productivity industries, the estimation focuses only on groups of domestic enterprises (Sun, 2009). All estimates are stable with panel data and adjusted by Driscoll and Kraay standard errors.

$$\begin{aligned}\text{Ln}\,TFP_{ijpt} = {} & \delta_0 + \alpha_1 Labourquality_{ijpt} \\ & + \alpha_2 Horizontal_{jpt} + \alpha_3 Vertical_{jpt} \\ & + \alpha_4 Papi_{ijpt} + \alpha_5 Technologygap_{ijpt} \\ & + \alpha_6 Scale_{ijpt} + \alpha_i + \alpha_j + \alpha_p \\ & + \alpha_t + v_{ijpt}\end{aligned}$$

1. Variable

LnTFPijpt: TFP is calculated based on the method by Levinsohn & Petrin (2003) as well as that of Zhang (2019).

$Labourquality_{ijpt}$: Labor quality, represented by the average of the training and coaching costs per employee of the enterprise (Le & Pomfret, 2011).

$Horizontal_{jpt}$: total revenue of industry j of all FDI firms year t divide total sales of industry firm j year t (Javorcik, 2004).

$Vertical_{jpt}$: $\sum_{r=1}^{p} \alpha_{jrt} * horizontal_{jpt}$, presence of FDI enterprises according to the downward linkage of industry j. a_{jrt} ($0 \leq a_{jrt} \leq 1$) is the ratio of industrial output r pulse to industry j. Values $a\,jrt$ from 2012 to 2017 are based on 2012 I-O Table prepared by GSO of Vietnam (Ni et al., 2017).

$Papi_{ijpt}$: Papi index from the annual survey from Centre for Community Support Development Studies; Viet Nam Fatherland Front; United Nations Development Programmed and Real-Time Analytics (Bach et al., 2017).

$Technologygap_{ijpt}$: Technology gap, measured by the ratio of firm's yield gap i to the average of the productivity of FDI firms in the same industry j (Anwar & Nguyen, 2011; Le & Pomfret, 2011).

$Scale_{ijpt}$: is the ratio of company i sales to the industry's total sales (Le & Pomfret, 2011).

α_i ; α_j; α_p,:α_t, dummy variables

v_{ijpt} : Errors

IV. Results

Table 2 presents the results of the regression of equation (3). In Col* (1), regression results for all domestic firms are displayed as follows: variable PAPI interactions, vertical and horizontal linkage effects. The institutional factor (PAPI) positively affects the aggregate productivity of domestic firms with an increase of 1.2%. This implies that the more transparent and accountable where the institutions can be, the better spreaded from the FDI sector the productivity of enterprises are (Yi et al., 2015; Zhang, 2019).

Overall, the impact of institutions on horizontal linkages reduces the productivity of domestic firms (Horizontal* PAPI has a value of -0.002). This can be explained in this way: when institutions are transparent, intellectual property rights are more monitored and the demonstration effects from domestic firms can get the attention of FDI enterprises.

Institutions reduce the impact on the learning ability of local enterprises through vertical linkages (the coefficient of impact Vertical*PAPI has a value of -0.021). This can be explained in this way: when supply contracts are tighter, Vietnamese firms in a low supply position are at a disadvantage when conducting negotiations. Furthermore, the learning process through labor migration becomes more and more difficult when breaking contracts from FDI enterprises to local firms is closely supervised.

That horizontal linkages have a negative impact on the productivity of enterprises in the same industry is due to the impact of competition that dominates the market of FDI enterprises. Besides, FDI enterprises

in the same industry with better wages and benefits than those of domestic enterprises can easily seize high-quality human resources from local firms (Gu & Lu, 2011; Xiao & Park, 2018).

Vertical linkage is an important spillover channel for domestic firms during this period with a positive impact on productivity (Le & Pomfret, 2011; Huynh et al., 2019). Once domestic enterprises provide inputs or participate in the supply chain of FDI enterprises and are in a good institutional environment, these FDI enterprises consider local firms as their partners. With collaboration, they can help domestic firms improve TFP by increasing the input demand and strengthening training for their other partners in the country.

The technology gap has a negative impact on productivity spillovers. This can be explained in this way: when this gap of domestic firms is closer to FDI firms, they can learn to increase productivity (Le & Pomfret, 2011). The remaining control HHI, scale variables have the same effects as expected in previous studies (Le & Pomfret, 2011). The variables in Equation 1 explain 16% of the effects of the studied factors on the TFP of domestic firms, this result is similar to that of Ni et al., (2017).

Column (2) in Table 2 examines the impact of institutions on SMEs. The institutions contribute to increasing the productivity of SMEs with less than 200 employees. That the impact coefficient of PAPI has a positive value of 0.015, larger than the impact on the total of enterprises means that SMEs have less hidden incurred costs for administrative work and devote considerable resources to improving productivity in a good institutional environment. The horizontal linkage effect of SMEs is competitively influenced more than the total one of enterprises (with a coefficient -0.028 compared to -0.017), which results from the insufficient resources of small-sized enterprises in comparison with other firms to protect their market share against FDI enterprises.

The sample is divided into groups, based on aggregate productivity as shown in Table 3, so as to comprehend the impact of institutions on productivity spillovers. Column (1) shows the results of domestic firms with TFP below 50% while Column (2) shows the results of enterprises with TFP above 50% as well as Column (3) highlights the results of the enterprises with TFP above 25%. The PAPI impact factor of column (1) is negative while those of columns (2) and (3) are positive. It is suggested that the enhanced institutional environment of local firms with low-capacity causes decreasing productivity; however, they can take the advantage of learning to improve productivity through horizontal linkages while vertical linkages have a negative impact. This can be explained in this way: enterprises with low productivity are not much capable of negotiating with their FDI partners and easily trammeled to reduce profits. Column (3) represents the resulting model of the group of domestic enterprises with a TFP higher than 75% of the total. This is a positive impact received through the horizontal linkages for the group

Table 2. Regression Results (Dependent Variable: lnTFP)

	All firm	SME workers less than 200 employees
Labourquality	0.047	0.060
	(0.006)***	(0.011)***
Horizontal	-0.017	-0.028
	(0.006)***	(0.006)***
Vertical	0.848	0.797
	(0.147)***	(0.598)
Horizontal* papi	-0.002	-0.004
	(0.000)***	(0.001)***
Vertical*papi	-0.021	-0.019
	(0.004)***	(0.015)
Papi	0.012	0.015
	(0.000)***	(0.001)***
Technologygap	-0.514	-0.476
	(0.035)***	(0.057)***
Scale	0.030	0.099
	(0.003)***	(0.017)***
Cons	-0.398	-0.532
Year dummy	Yes	Yes
	(0.003)***	(0.043)***
N	61,656	57,567
R square	0.1605	0.154

* p<0.1; ** p<0.05; *** p<0.01

of enterprises with high productivity (impact coefficient of 0.013). These firms can address the competitive impact of FDI enterprises and make effective use of spillover effects through observation, imitation and labor mobility. Horizontal linkages' impact recorded positive and larger than Column (2) proves that these firms, due to great capacity, can easily negotiate and learn when they join the supply chain. What is more essential, our results suggest that the institutional effects increase productivity for firms with a highly competitive advantage. Furthermore, it is indicated that self-reforming enterprises within an integrated environment are more beneficial while the institutions are gradually completed. In contrast, enterprises, based on friendly relationships and operating under the old model, are increasingly eliminated (Peng, 2003).

Table 3. Regression Results by Firm Productivity Group (Dependent Variable: lnTFP)

	<=50% lnTFP	>50% lnTFP	75% lnTFP
Labourquality	0.011	0.010	0.004
	(0.001)***	(0.002)***	(0.000)***
Horizontal	0.076	0.003	0.013
	(0.014)***	(0.001)***	(0.000)***
Vertical	-3.319	0.287	0.326
	(0.239)***	(0.022)***	(0.135)**
Horizontal* papi	0.002	-0.000	-0.001
	(0.000)***	(0.000)***	(0.000)***
Vertical*papi	0.082	-0.007	-0.008
	(0.006)***	(0.001)***	(0.003)**
Papi	-0.006	0.001	0.001
	(0.000)***	(0.000)***	(0.000)***
Technologygap	2.007	-0.370	-1.232
	(0.077)***	(0.070)***	(0.381)***
Scale	-0.085	0.039	0.059
	(0.168)	(0.001)***	(0.000)***
Cons	0.329	0.152	0.154
	(0.022)***	(0.000)***	(0.007)***
Year dummy	Yes	Yes	Yes
N	23,257	38,399	18,858
R square	0.893	0.608	0.742

* p<0.1; ** p<0.05; *** p<0.01

Studying the institutional effects on absorptive capacity from the FDI sector to domestic firms is further studied. Table 4 shows the effects of the components of the PAPI on equation (3) with the following factors: participation, transparency, accountability and corruption control for regression analysis results with Columns (1), (2), (3), and (4), respectively. The coefficient of impact of variable Papi on TFP of domestic enterprises is positive and statistically significant. This means that: when local institutions are improved, it will help local businesses learn to actively improve their TFP. That the sum of the coefficients of Horizontal and Horizontal*papi is negative shows that a good institutional environment limits the horizontal spillover. This result indicates that the ability of domestic enterprises to learn from FDI enterprises through demonstration and imitation effects will be limited uopn the impact of increasingly-developed institutions, especially intellectual protection rights. That the impact coefficient of the interactive variable (Vertical*Papi) has positive values in Columns (2) and (4) indicates that the two factors of transparency and corruption control make domestic firms receive positive impacts from vertical linkages. That the total impact coefficients of vertical and vertical*papi from all 4 Columns are positive affirms that: in one environment, the channel is linked once all components of the participation (transparency, accountability, and corruption control regimes) are developed. Horizontal is being an essential channel to help domestic business spread.

Therefore, regions with improved formal institutional components enable local firms to increase their overall productivity.

Table 4. Regression Results according to the Components of PAPI (Dependent Variable: lnTFP)

	Papi Participaion	Papi Transparancy	Papi Accountability	Papi Corruption control
Labourquality	0.047	0.050	0.047	0.049
	(0.006)***	(0.006)***	(0.006)***	(0.056)***
Horizontal	0.005	0.014	0.011	0.006
	(0.001)***	(0.002)***	(0.000)***	(0.017)***
Vertical	0.002	-0.022	-0.001	-0.004
	(0.000)***	(0.003)***	(0.001)	(0.000)***
Horizontal*Papi	-0.082	-0.228	-0.179	-0.104
	(0.011)***	(0.027)***	(0.006)***	(0.259)***
Vertical*Papi	-0.039	0.353	0.014	0.085
	(0.008)***	(0.043)***	(0.010)	(0.001)***
Papi	0.053	0.029	0.064	0.057
	(0.001)***	(0.001)***	(0.001)***	(0.018)***
Technologygap	-0.641	-0.310	-0.606	-0.256
	(0.032)***	(0.039)***	(0.035)***	(0.529)***
Scale	0.032	0.025	0.028	0.036
	(0.003)***	(0.003)***	(0.003)***	(0.031)***
Cons	-0.223	-0.096	-0.308	-0.310
	(0.010)***	(0.005)***	(0.009)***	(0.043)***
Year dummy	Yes	Yes	Yes	Yes
N	61,656	61,656	61,656	61,656
R square	0.152	0.137	0.168	0.165

* p<0.1; ** p<0.05; *** p<0.01

V. Discussion and Conclusions

This paper examines the institutional effects of FDI on the productivity of firms in Vietnam. Based on a panel data set of enterprises that were doing business from 2012 to 2017, the research emphasizes one formal institutional importance that influences absorptive capacity from the FDI sector to domestic manufacturing enterprises. Different to previous studies, our research in Vietnam mainly focusses on spillover channels to further explore the impact of institutions on spillover effects. Our findings contribute to different perspectives to the spillover effects due to the absorptive capacity (Meyer & Sinani, 2009), in which formal institution is a factor. In the context of finding the motivation to overcome the middle-income trap, the research paper may assist policy makers to make reasonable decisions. Moreover, small-sized enterprises take the advantage of positive impact from institutions; consequently, they are more productive than the total sum of enterprises.

Horizontal linkages with FDI firms in the same industry leave a negative impact on productivity while vertical linkages remain a significant role (Le & Pomfet, 2011; Ni et al., 2017). Enterprises with high integrated productivity can benefit a lot in the increasingly completed and transparent local institutional environment whereas firms with low productivity may have disadvantages while numerous FDI firms are emerging. From our research result, it is argued that local governance quality including participation, transparency, accountability and corruption control affects corporate productivity positively, in which

the transparency of local authorities and effective corruption control can help domestic enterprises gain positive impacts upon a supplier being to FDI partners.

Our findings recommend significant practical policy implications for managers and policy makers. Upon building the legal document system to encourage investment, the governments should pay attention to regional factors and provide development priority policies based on the current capacity of each region as well as conduct in-depth researches on business analysis tables in each area. More importantly, SMEs should be prioritized for further consideration in financial support with quick access and administrative procedure completion to promote their faster learning ability.

Institutional quality at the provincial level has a positive impact on productivity spillovers; as a result, regions need to have policies for further institution improvement. It is important to create forums for regular discussions with leaders of domestic and foreign firms to listen to feedbacks related to local policies on those issues that need to be improved.

Vertical linkages in the supply chain are essential for productivity spillovers; consequently, there should be additional policies to encourage multinational FDI enterprises to invest. Tax incentives for FDI enterprises to participate in buying input materials for domestic firms are especially proposed.

In terms of domestic firms, the regulatory agency should create a forum to help enterprises acquire knowledge and management skills besides sharing experiences in participating in the supply chain. A consulting center to support enterprises restructure with the goal of increasing productivity should be built while the institutions are increasingly perfect.

What is more, this study has the limitation of not having access to the most updated data until 2020 and only stops at analyzing manufacturing enterprises without analyzing the spillover effects on the group of businesses operating in the service industry. Further researches should deeply analyze the origin of FDI in order to see more clearly the impact of institutions on productivity spillovers to enterprises in the host country. A possible direction for further research is to examine the impact of informal institutions (for example: culture element) on spillovers from the FDI sector on the ability to absorb productivity gains of the domestic firms.

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