Export Spillovers from FDI in Manufacturing Industry in Viet Nam

Loi Van Ta
School of Trade and International Economics, National Economics University,
Vietnam.
Nhuong Huy Bui[*]
School of Trade and International Economics, National Economics University,
Vietnam.
Ngoc Bich Nguyen
School of Trade and International Economics, National Economics University,
Vietnam.
Hoi Quoc Le
Faculty of Economics, National Economics University, Vietnam.
Duc Tien Vu
School of Advanced Education Programs, National Economics University,
Vietnam.

[*] **Corresponding author**: Email: nhuongbh@neu.edu.vn

Abstract

𝔙iet Nam has reached more than 20 years since the first FDI project. This study aims to examine export spillovers from FDI in the manufacturing industry and measure the effects of country characteristics and linkages between FDI enterprises and domestic firms on the export performance of the industry in Viet Nam. We use   panel data from 4203 manufacturing export firms from 63 provinces, collected from the General Statistics Office of Viet Nam from 2010 to 2016. We employ the Generalized Method of Moment (GMM) to solve the endogenous problem. The empirical findings show that FDI complements exports, and the complementary effect is contingent upon the technology levels of sectors in manufacturing industries. FDI is most effective for promoting exports in high- and medium-high technology level industries, while is least effective in low and medium-low technology level industries. In addition, the findings show that better characteristics of the host country, such as human capital, the business environment, and financial market, contribute to   stronger export spillovers from FDI in the industries. Accordingly, the study advocates for well-designed policies that prioritize strengthening linkages between FDI enterprises and domestic firms, channelling FDI to strategic sectors, and improving the quality of human capital, financial markets, and the business environment.

1. Introduction

Theoretical literature indicates that foreign direct investment (FDI) inflows can promote exports by augmentation of domestic capital, technological and knowledge-based spillovers, improvements in competitiveness, and strengthening export channels, directly and indirectly (Naudé & Szirmai, 2012; Mei, 2021; Girma, Görg & Stepanok, 2020; Kutan & Vuksic, 2007). However, empirical studies have shown the different export benefits from FDI to host countries and may not be automatic and obvious according to the characteristics of these host countries (Ebghaei & Wigley, 2018; Dao & Sun, 2012; Sahoo & Dash, 2022).

FDI inflows to Viet Nam have made positive contributions to Viet Nam's exports in the period of 2011-2020 (Ministry of Planning and Investment, 2020). Although attracting investment and promoting exports are still regarded as the key drivers of economic growth, the concern of whether FDI inflows brings benefits as expected does not fade away. From host countries' perspective, FDI inflows unavoidably become double-edged: on the one hand, relaxing the access to FDI could help promote export growth through reliable funds, source provision, and advanced technology transfer ; on the other hand, it is also necessary to keep a sharp lookout for a potential negative spillover effect from FDI by crowding out local entities from international market share, which harms domestic firms' export performance. Hence, the extent is uncertain, complicating the linkage between FDI inflows and domestic export flows (Jin et al., 2021).

It is widely recognized that FDI inflows create export effects throughout horizontal and vertical (backward and forward) spillovers. Horizontal spillovers within sectors may arise when domestic firms increase their production efficiency by hiring employees of foreign firms or by imitating a new process observed in the local market, which contributes to the increase in exports (Javorcik, 2004). Vertical spillovers have been distinguished between the input sourcing behaviours of backward and forward linkages, where the backward linkage refers to the inputs supplied by domestic firms to multinational firms and the forward linkage refers to the inputs supplied by multinational firms to domestic firms. These relationships between domestic firms and multinational companies reveal the mechanisms and conditions of export spillovers from FDI (Javorcik, 2004; Newman et al., 2015). The consensus is now that the bulk of FDI spillovers is expected to be vertical in nature and have backward linkages in particular (Jin et al., 2021; Moralles& Moreno, 2020; Todo et al., 2009; Abraham, 2010; Cheung & Lin, 2004; Kohpaiboon, 2006; Marin & Bell, 2006; Franco & Sasidharan, 2010), whereas the empirical evidence of such spillover effects thus far has been inconclusive.

Most empirical studies focus on horizontal (intra-industry) export spillovers and find no or negative effects of FDI on the export of domestic firms (e.g., studies of Djankov & Hoekman, 2000 for the case of the Czech Republic; and Bernard & Jensen, 2004 for the case of the US manufacturing industry). Several studies, particularly on vertical (inter-industry) spillovers, provide positive evidence of export spillover effects from foreign to domestic firms (Javorcik, 2004; Newman et al., 2015; Jude, 2015; Bournakis, 2021). The contradictory results are not surprising, as the circumstances through which FDI creates and increases spillovers are left open in these studies. The research has mainly focused on the question of whether export spillovers exist, and few studies explore the conditions which influence the existence and magnitude of export

spillovers. Thus, there is a need for further measures to examine when, where, and how export spillovers from FDI may occur.

This study measures export spillovers from FDI in Viet Nam by using firm-level data from 2010 to 2020. The paper distinguishes between horizontal spillovers and vertical spillovers and examines the impacts of the country's business environment and domestic firms' characteristics on the horizontal and vertical export spillovers from FDI. In particular, the technological gap between MNCs and domestic firms, ownership structure, firm size, trade orientation, and absorptive capacity of domestic firms are considered in searching for different effects of export spillovers. We also address whether or not FDI's characteristics create the emergence and magnitude of export spillovers by measuring the types of FDI firms' foreign ownership and trade orientation.

The study is organized as follows: Section 2 reviews the literature on FDI and export spillovers. The empirical framework is described in Section 3, and the data are discussed in Section 4. The empirical results are in Sections 5-7 which report the baseline findings on horizontal and vertical export spillovers, the relationships between the country business environment, industry technology levels, firms' characteristics (domestic firms and FDI companies), and export spillovers. Section 7 resents conclusions.

2. Export spillovers from FDI

2.1. Horizontal export spillovers

Horizontal export spillovers refer to the effect that MNCs may have on the decision to export and the export intensity of domestic firms in the same sector in which they carry out their foreign investments (Greenaway et al., 2004). MNCs may provide export externalities to domestic firms through several mechanisms. First, domestic firms may be able to learn simply by observing and imitating product innovations or novel forms of organization adapted to local conditions. By forming supply contracts between MNCs and domestic firms, MNCs reduce the risk and cost for domestic firms in accessing new technology, innovations, or producing processes throughout the process of technology transfers and training (Kim & Xin, 2021& Lu, Tao & Zhu, 2017; Hu & Tan, 2016). Secondly, skilled labour moving from MNCs to domestic firms contributes to the better export capability of domestic firms in intra-industries. This skilled labour disseminates technology from MNCs to domestic firms as workers or start their own businesses. This export spillover is particularly important for highly competitive or costly human capital sectors (Mei, 2021; Franco, 2013). However, MNCs naturally tend to discourage highly trained workers from leaving by paying salaries above local standards: labour turnover would be low in countries where MNCs have substantial advantages over domestic firms (Mei, 2021). Thirdly, export spillovers are created by high export pressure for domestic firms in competition generated by MNCs, both for the output market and input resources. Greater competitive pressure may induce domestic firms to produce new products, use new technology, or adapt new management skills, which creates better export capability, whereas it limits domestic firms access to input resources, which forces domestic firms to incur higher costs in producing export products (Tang & Zhang, 2016; Bournakis, 2021; Javorcik, 2004).

Different data sets are used to estimate horizontal export spillovers for domestic firms in many empirical studies. With a firm-level dataset, evidence of horizontal export spillovers is generally inconsistent.

Many studies show negative or insignificant horizontal export spillover from FDI. With the UK data case, Girma et al. (2001) found no significant effect of foreign presence on the overall labour or factor productivity of British firms from 1991 to 1996. Konings (2001) found that FDI is important for transferring technology to an affiliate, whereas it provides evidence of negative export spillovers to domestic firms in Bulgaria and Romania from 1993 to 1997 and no evidence of export spillovers in Poland. Damijan et al. (2003) find that spillovers are rare in 10 transition economies in Eastern Europe, but there is no evidence of negative export spillovers.

On the other hand, Liu et al. (2000), Haskel et al. (2002), and Harris & Robinson (2003) used UK microdata for manufacturing firms and find a significantly positive relationship between a domestic firm's total factor export productivity and the foreign affiliate share of activity in that industry. Furthermore, in the same dataset, Haskel et al. (2002) show positive export spillovers from the presence of MNCs from the United States and France, whereas Japanese firms generate negative export spillovers. Recently, studies showed a positive effect of horizontal export spillovers to domestic firms from MNCs (e.g., Ebghaei & Akkoyunlu Wigley, 2018 for the case of Turkey; Arif-Ur-Rahman & Inaba, 2021 for the case of Bangladesh; Sarker & Serieux, 2022 for the case of Brazil). However, if MNCs are segregated, the horizontal export spillovers are most closely related to high foreign ownership and high export rates.

Besides, studies with industry-level data show differences across industries in export productivity. The positive correlation between MNCs and domestic firms' export-productivity might be partially since most MNCs are in export productive industries. Thus, industry-level data may lead to an endogeneity problem and an upward bias.

Mixed evidence for horizontal export spillovers can be explained by differences in local firm characteristics and host country conditions. The negative impact is usually due to the absorptive capacity of domestic firms along with the technology gap between foreign and domestic firms. Several studies find evidence of horizontal export spillovers from MNCs to local firms engaged in R&D (Kinoshita, 2000 for Czech Republic; Kathuria, 2000 for India; Franco, 2013 for OECD countries). Other studies show that the skill level of the industry and of domestic firms is positively correlated with export productivity spillovers (Girma et al., 2020, for China; Girma et al., 2008, for Canada; Girma et al., 2001 for the UK; Schoors & Van der Toll, 2002 for Hungary). When conducting the study with data from Europe's top six countries, horizontal export spillovers are statistically present and economically important when considering geographical distances between domestic firms and MNCs in the same industries in Europe (Bournakis, 2021). More interestingly, when conducting research in Namibia, Sherif et al. (2022) showed that positive horizontal export spillovers from FDI are promoted by female workers. MNCs in the manufacturing sector prefer female workers due to their efficiency; they are a link to promote export spillover in this southwestern African country.

Regarding the technology gap, Buckley et al. (2010), when doing research with data in China pointed out that the export horizontal spillover effect is smaller in industries with a larger labour productivity gap between local and foreign firms. If the export productivity gap is small, foreign technology seems to be more useful to domestic firms because they have the necessary skills to learn foreign technology. They argue that foreign presence leads to positive effects for companies with a low technology gap and negative effects for companies with a high technology gap. In other words, if domestic firms' technology level is not too different or is able to reach the level of MNCs, then MNCs diffuse the exports of domestic firms.

The emergence of horizontal export spillovers is related to competition in the domestic market. Girma et al. (2001) also pointed out the importance of competition in determining horizontal export spillovers in UK manufacturing. Girma et al. (2020) showed evidence of a link between Chinese firms and MNC subsidies. They find that the greater the degree of foreign competition in the industry, the greater the horizontal export spillover. In addition, there is evidence of improving competitiveness in manufacturing enterprises through the development of a female labour force. Tanaka (2015) in a case study in Japan, and Sherif et al. (2022) in a case study in Namibia, asserted that the horizontal export spillover through the female labour channel tends to be stronger than the total labour channel. Therefore, studies encourage stakeholders to increase investment to develop the capacity of female workers to increase competitive advantage and enhance horizontal export spillovers. The greater the level of competition, the greater the promotion of horizontal export spillovers through the development of the female labour force.

Another factor that may influence horizontal export spillovers is the export orientation of domestic firms. Sinani & Meyer (2004) and Girma et al. (2020) showed a similar result in Estonia and China; Koenig et al. (2010) showed evidence of the presence of export spillovers on the export decision but not on the exported volume. Since export-oriented firms already face competitive pressure from the world market, their productivity is not significantly affected by the presence of foreign enterprises in the domestic market.

2.2. Vertical export spillovers

Vertical export spillovers occur between MNCs and local enterprises across industries. The vertical spillovers have been distinguished between the input sourcing behaviours of backward and forward linkages, where the backward linkage refers to the inputs supplied by domestic firms to MNCs and the forward linkage refers to the inputs supplied by MNCs to domestic firms (Mei, 2021; Javorcik, 2004; Newman et al., 2015).

Backward linkages create export spillovers through several channels. First, MNCs can transfer technology directly to their local suppliers by providing training or technical support to increase the quality of the supplier's product. Second, the higher requirements for product quality and on-time delivery from MNCs may encourage local suppliers to improve production processes or technologies, which indirectly raise domestic firms' export capability (Javorcik, 2004; Hamida, 2011; Giroud et al., 2012).

In terms of research on industry-level data, research perspectives are having mixed conclusions. Javorcik (2004), in his study in Lithuania, argued that the backward effect is more likely to occur when upstream domestic firms supply inputs to downstream multinationals. In contrast, Blalock & Gertler (2008) suggested that MNCs can establish relationships with more domestic suppliers in order to reduce reliance on single suppliers and reduce input prices. Also, with the goal of reducing input prices, Pack & Saggi (2001) argued that downstream MNCs can increase the demand for inputs from upstream firms. Increased demand can increase the output of the upstream business, thereby helping the technology adopters in the local supplier pool. Furthermore, Xu & Sheng (2012) found the negative effects of backward spillovers on Chinese manufacturing firms from 2000 to 2003. According to Barrios et al. (2011), the evidence against backward spillovers stems from the use of aggregate data across sectors from the host country's input-output tables, with the positive effects of backward spillovers appearing only after the input-output tables are switched from the host country to the multinationals' home countries.

From the perspective of research on corporate data, backflow is studied in two directions: group (1) developed countries and group (2) developing countries. With group

(1), studies provide evidence of positive vertical spillovers on exports of domestic firms (Ruane & Sutherland, 2005 for the case of Ireland; Kneller & Pisu, 2007; Greenaway et al., 2008 for the case of UK; Karpaty & Kneller, 2011, for the case of Sweden). In contrast, some studies show no evidence or insignificant vertical export spillovers on domestic firms from MNCs (Barrios et al., 2003 for the case of Spain). However, they also found that FDI has a negative impact on the export intensity of domestic firms (Franco, 2013). With group (2), studies also show a negative export spillover from FDI (Chen et al., 2020 for the case of Taiwan; Ciani & Imbruno, 2017 for the case of Bulgaria). Whereas, other studies indicate MNCs have positive spillovers through backward linkages on exports of domestic firms (e.g. Schoors & Van der Tol, 2002 for Hungary; Javorcik, 2004 for Lithuania; Chen et al., 2013 for China), and positive spillovers through forward linkages on exports of domestic firms (e.g., Arif-Ur-Rahman & Inaba, 2021 for Viet Nam). Besides, Chen et al. (2011) asserted that MNCs' outsourcing creates a positive effect of information spillover on the export intensity of domestic firms, while the technology spillover effect is limited.

Forward linkages may result in export spillovers via a variety of channels. In the beginning, domestic firms may benefit from MNCs' supplies of intermediate goods and machinery, which provide higher-quality products at lower costs. Secondly, as MNCs' marketing outlets, domestic firms may receive assistance in the form of sales training and sales equipment, resulting in increased export externalities. Thirdly, FDI in infrastructure and business services directly increases customer productivity if these services are introduced or improved (Franco & Sasidharan, 2010).

In terms of industry data, a forward spillover effect on domestic firms is expected to occur as domestic firms gain access to newly improved inputs produced by MNCs. MNCs inputs, which have traditionally included advanced technologies, have helped to improve production and organizational processes in domestic firms. Forward spillovers would benefit domestic firms if the inputs provided are accompanied by other services and supports, such as human resource training and know-how for domestic buyers (Javorcik, 2004). In addition, Ciani & Imbruno (2017), looking at the Bulgarian data, showed a positive forward spillover from FDI in terms of export value and quantity through quality upgrading. Anwar & Nguyen (2010) reviewed data from Vietnamese manufacturing firms and concluded that FDI promotes exports of domestic firms through forward spillovers. However, this forward spillover is only significant for domestic firms using less advanced technology. Furthermore, some studies provide evidence of negative forward spillovers on the export productivity of domestic businesses (e.g., Kim, 2015 for the case of Korea; Newman et al., 2015 for the case of Viet Nam; and Jude, 2015 for the case of a group of countries in Central and Eastern Europe).

In terms of firm-level data, it is generally not easy for studies to determine the positive or negative trend of forward export spillovers. Mei (2021), when reviewing data provided by the European Bank for Reconstruction and Development (EBRD) in conjunction with the World Bank Business Environment and Enterprise Performance Survey (BEEPS), produced mixed results. Based on quantitative evidence, forward spillovers have both positive and negative effects. But based on current standard measures, no evidence was found to support vertical spillovers, including forward spillovers. Tomohara & Yokota (2006) conducted research in Thailand and found that forward spillover has no effect on domestic firms. Barrios et al. (2011), when reviewing data in Ireland, found a lack of evidence regarding the extent of forward spillover effects. Moreover, this study further confirms that the present research measures are completely dependent on the assumption that MNCs of different nationalities have the same supply behaviour as domestic firms in the host country, potentially leading to skewed estimates

of forward spillover effects. To alleviate this assumption, studies combine input-output tables taken from the country of each MNCS to estimate forward linkages. However, due to the lack of data on the direct link of domestic firms to MNCs, the magnitude of the forward spillover effects on exports cannot be determined. On the other hand, by arguing that customer-supplier conflicts may differ from those assumed by existing studies, Görg & Seric (2016) used MNCs' supplier data and found that the supply of inputs to multinationals is positively related to firms' productivity. In addition, several studies also show evidence of a negative impact of forward linkage on domestic firms (e.g. Javorcik, 2004, for the case of Lithuania).

Overall, the lack of consistent evidence raises doubts about whether such export spillover effects exist. More importantly, current vertical spillovers are based on industry-level measurements combined with input-output tables, implying that they can only measure indirect industry linkage effects. Differences in sourcing and sourcing practices between firms may be significant for the empirical findings and explain why the empirical evidence mixtures regarding the beneficial vertical spillover effects of FDI on the export productivity of domestic firms emerged. However, the existing empirical literature mainly focuses on the fundamental question of whether vertical export spillovers exist. Simultaneously, there is not much evidence that the circumstances will determine the level of such spillovers. In fact, the latter question deserves the most attention because policy debates are no longer about whether to allow FDI inflows. Instead, the need to disentangle the different channels through which the effect occurs is also a priority in the export spillover studies (Kneller & Pisu, 2007; Franco, 2013; Mei, 2021). This study has been considering the gap by measuring the effects of factors involved, including the local business environment, industries' technology levels, the characteristics of local and foreign firms, and the export spillovers from FDI in Viet Nam.

3. Empirical Framework

We model that export spillovers from FDI to domestic firms in the manufacturing industry in Viet Nam depend on domestic firms' absorptive capability, the industry's technology levels, the country's business environment, and FDI's characteristics.

$$\text{LogEXP}_{ijt} = f(\text{logLAB}_{ijt}, \text{LAQ}_{ijt}, \text{FI}_{ijt}, \text{REV}_{ijt}, \text{logCAP}_{ijt}, \text{SIZE}_{ijt}, \text{DEM}_{jt}, \text{PCI}_{ijt}, \text{IFDI}_{jt}, \mu_{it})$$

(1)

Where, EXP_{ijt} is export value of firm i in industry j during year t. The value of variables such as EXP_{ijt}, LAB_{ijt} and CAP_{ijt} is highly fluctuating between enterprises. Thus, we replace them with variables such as logEXP_{ijt}, logLAB_{ijt} và logCAP_{ijt}.
logLAB_{ijt} is the number of workers in firm i in industry j at year t.

LAQ_{ijt} is the quality of human resources of firm i in industry j at year t, which is measured by the average expenditure for one labourer in the firm i. It is counted by the equation: LAQ_{ijt} = total labour expenditure / total labour numbers. We use the average expenditure per labour to measure the quality of the human resources of a firm because studies in Viet Nam show that higher-quality workers often receive higher payments than lower-skilled workers (Anwar & Nguyen, 2010).

logCAP_{ijt} is the total assets of firm i in industry j at the beginning of the year t. Financial capacity will determine the level of investment in technology innovation by enterprises in the industry and decide whether to expand production scale and export.

FI_{ijt} is the importance of foreign capital for the operation of firms and is measured by the foreign capital proportion of firm i in industry j at year t.

REV_{ijt} is the commercial scale of firm i in industry j at year t and is measured by % of the turnover of firm i compared to the total turnover of the industry j.

$SIZE_{ijt}$ is the size of firm i in industry j at year t. Based on the classification according to Article 3 of Decree 56/2009/ND-CP in Viet Nam, we conclude that 1 is a micro firm, 2 is a small firm, 3 is a medium firm and 4 is a large firm.

DEM_{jt} is the level of production concentration in industry j year t. This variable is measured by means of the Herfindahl index for domestic firms. The level of concentration in industry j is defined as follows: where x_{ijt} is the sales of firm i in industry j at year t and X_{jt} is the total sales of industry j at year t.

$$HERF_{jt} = \sum_{i=1}^{n} \left(\frac{x_{ijt}}{X_{jt}} \right)^2 \qquad i = 1,2,\ldots,n \qquad (2)$$

PCI_{ijt} represents the business environment conditions of firm i in industry j, measured by the Provincial Competitiveness Index (PCI) - an indicator of the competitiveness of provinces and cities in Viet Nam through the evaluation of ratings according to component indicators such as land access, transparency, time costs, informal costs, fair competition, dynamism, business support services, labour training, and legal institutions.

$IFDI_{jt}$ represents export spillovers from FDI inflows. FDI spillovers may occur through both horizontal and vertical linkages between domestic firms and FDI firms where vertical linkages can be divided into forward or backward categories. The degree of horizontal spillovers in industry j at year t, $IFDIHorizontal_{jt}$, is measured as follows: where Y^f_{jt} is sales of the FDI enterprises in industry j at year t, and Y_{jt} is sales of the entire industry j at year t.

$$IFDIHorizontal_{jt} = \frac{Y^f_{jt}}{Y_{jt}} \qquad (3)$$

The vertical spillover effect is divided into two categories: the vertical backward effect and the vertical forward effect. The degree of backward spillover effect in industry j at year t is measured as follows, where Y_{kj} is the output of industry k supplied to industry j. It is considered that the higher the proportion of output provided from industry k to industry j with foreign presence and the more activities of FDI firms in industry j receiving inputs from industry k, the greater the value of the spillover effect (Hamida, 2011; Girma et al., 2008). This measure captures the extent of backward linkages between local firms in upstream industries and foreign firms in downstream industries. An increase in IFDI leads to an increase in the output of foreign firms, which leads to an increase in the supply of inputs to domestic firms.

$$IFDIBackward_{jt} = \sum_{\forall k \neq j} \alpha_{kjt} IFDIHorizontal_{kt} \qquad (4)$$

$$\alpha_{kj} = \frac{Y_{kj}}{Y_k}$$

(5)

The degree of vertical forward spillover effect in industry j at year t is measured as follows, where Y_{hj} is the output of industry h supplied to industry j. This measure captures the extent of forward linkages between local firms in downstream industries and foreign firms in upstream industries. An increase in IFDI leads to an increase in demand for inputs produced by domestic firms.

$$IFDIForward_{jt} = \sum_{\forall h \neq j} \beta_{hjt} IFDIHorizontal_{ht}$$

(6)

$$\beta_{hj} = \frac{Y_{hj}}{Y_j}$$

(7)

α_{kj} is the proportion of output of the industry k supplied to industry j and β_{hj} is the proportion of output of the industry h consumed by industry j; α and β are drawn from the Input-Output Tables issued by the General Statistics Office.

4. Data

The data is collected from the annual enterprise survey conducted by the General Statistics Office of Viet Nam (GSO) and provides information on formal economic entities in Viet Nam from 2010 to 2016. The dataset contains information on the property structure of the enterprise, sales, output, labour, total costs, capital stock, investment, location, ownership, research, and development (R&D) activity, export value, and other specialized questions. The number of firms per year varies from a low of about 10,000 firms in 2010 to a high of more than 25,000 firms in 2016. After deleting firms with missing values, zero export, zero output, zero employment, and observations failing to satisfy other basic error checks, the usable data set is an unbalanced panel of 4,203 export firms, of which 1,795 are FDI firms and 2,408 are domestic firms in the manufacturing industry. All variables are deflated to 2010 prices using the consumer price index.

The sectoral classification of enterprises is at the two-digit level of the Vietnamese Standard Industrial Classification (VSIC). Since the IO table classifies industry into two-digit-level industries, we do not classify industry at a more disaggregate level to make a concordance between the IO table classification and the VSIC classification.

The domestic sector is defined to include state-owned enterprises, non-state collective establishments, domestic private firms, and households. Foreign firms are defined as all establishments with foreign investors (joint ventures and 100% foreign-invested firms). A distinction between joint ventures and 100% foreign-invested firms is made to examine the impact of foreign ownership on domestic firms' performance through export transfer.

5. Horizontal and vertical export spillovers from FDI

This section reports results on the effect of FDI through both horizontal and vertical linkages on the exports of domestic firms. The results in Table 1 show that the effect of horizontal spillovers on export is positive and significant. This implies that greater amounts of intra-industry linkages between foreign firms and domestic firms increase the export of domestic firms in the manufacturing industry in Viet Nam.

Several reasons can explain why intra-industry linkage an important channel of export diffusion from foreign firms to domestic firms in Viet Nam is. Foreign firms are more likely to share their know-how and technology with domestic firms in the same industry because the intermediate goods are supplied by domestic firms through their supply chain in the same industry. Moreover, domestic firms may benefit from technology spillovers through the training and turnover of workers provided by foreign firms, through visits to domestic firms by technical staff of foreign firms, and through the movements of workers from foreign firms to domestic firms in the same industry.

The backward export spillovers from FDI are negative and significant. This result is consistent with recent studies' findings in the case of developing countries. It is understood that more inputs from FDI enterprises from domestic firms may lead to lower exports from domestic firms. The reason for these negative vertical spillovers in the manufacturing industry in Viet Nam may come from the fact that focusing on supplying FDI enterprises' inputs may reduce the resources for export intensity of these domestic firms.

Among the other control variables, labour productivity is positively related to capital intensity. The coefficient of labour quality is positive and significant at the 1% level, suggesting that a larger share of skilled workers increases the labour productivity of domestic firms. The effect of competition on productivity captured by the concentration variable is negative and significant. A reduction in industry concentration (an increase in the level of competition) increases the productivity of domestic firms in the industry.

This reveals that the competition for manufacturing resources in the local market induces domestic firms to enhance their efficiency in using resources to maintain their market share, which in turn enhances their productivity. The coefficient of a country's business environment is positive and significant, suggesting that a better business environment, particularly market entry costs, land access, transparency, time costs, informal costs, dynamic business support services, labour training, and legal institutions, contributes to the increase of positive export spillovers from FDI.

Table 1: Horizontal and Vertical Export Spillovers from FDI

Dependent Variable: Export of Domestic Firms

Independent Variables	Fixed effect (1)		Fixed effect (2)		Fixed effect (3)	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
logLAB	.795*** (9.03)	0.000				
logCAP	.144*** (2.92)	0.004				
LAQ	.000* (1.83)	0.067				
DEM	-.473** (-1.97)	0.049				
PCI	.129*** (10.96)	0.000				
IFDIHorizontal	1.308*** (2.69)	0.007				
IFDIBackward	-1.154** (-2.37)	0.018				
IFDIBackw*SIZE			-1.007** (-1.99)	0.046	-	
IFDIForw*SIZE			1.049* (1.78)	0.075	-	
IFDIHoriz*LAQ			-		-.016** (-2.44)	0.015
IFDIBackw*LAQ			-		-.005** (-2.36)	0.018
IFDIForw*LAQ			-		.019** (2.43)	0.015
Obs.	4203		4203		4203	
R-squared	0.1507		0.1520		0.130	
Adj R-squared	0.1484		0.1491		0.1502	

*Notes: *, ** and *** indicate statistically significant at the 10%, 5% and 1% respectively.*
Standard errors are in parentheses.

Source: Authors calculated from annual enterprise survey data conducted by General Statistics Office of Viet Nam

The absorptive capacity of domestic firms may facilitate export spillovers. To account for the absorptive capacity of domestic firms in determining the extent of export spillovers, we interact labour quality and firm size with the spillover variables. Results shown in column 2 of Table 1 reveal a negative effect of backward spillovers and a positive effect of forward spillovers according to the size of domestic firms. This means that when the larger firms focus more on supplying inputs to FDI enterprises in the domestic market, the pressure of export competition in the industry may decrease, which shows negative export spillover effects in the industry through competition channels. Whereas more large domestic firms are FDI enterprises' customers, export spillovers from FDI are more significant. This implies that the linkages between FDI enterprises and domestic firms are strengthened when these domestic firms have a larger size, which motivates technology and knowledge transfer, then export capability.

The results shown in column 3 of Table 1 indicate a negative effect of horizontal spillovers and backward spillovers and a positive effect of forward spillovers on the horizontal spillover according to domestic firms' quality of human capital. This explains that when the quality of human capital increases, there will be more positive export spillovers from FDI to domestic firms in the same industry. This suggests that in an industry where local labour quality is low, FDI enterprises are forced to employ more skilled workers from other foreign countries, which leads to an increase in labour costs, and a decrease in export spillovers through the knowledge transfer channel. In addition, when labour costs increase, the export spillover from FDI enterprises to domestic firms that supply input to these FDI enterprises will decrease. This suggests that domestic firms bear higher labour costs due to the need for more foreign workers who are instead low-skilled local workers, which means fewer local workers can access advanced skills transferred from FDI enterprises. Thus, this leads to less export spillover from FDI through the labour mobility channel. In contrast, higher labour quality in domestic firms that are FDI enterprises' customers leads to their better ability to absorb technology transfer from FDI enterprises, which helps to increase the export capacity of domestic firms.

6. Industry and firm characteristics and export spillovers

Firm and industry heterogeneity may explain part of the nexus between FDI and export spillovers. In this section, we examine the relationship between a country's business environment, industries' technology levels, foreign firms' characteristics, domestic firms' absorptive capability, and export spillovers.

Table 2: The Impact of Technology Level on Export Spillovers
Dependent Variable: Export of Domestic Firms

Independent Variables	Low technology level		Medium-Low technology level		Medium-High technology level		High technology level	
	Random effect (1)		Random effect (2)		Random effect (3)		Random effect (4)	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
logLAB	.916*** (7.69)	0.000	.652*** (4.36)	0.000	-		-	
logCAP	-		.258*** (2.97)	0.003	.571** (2.43)	0.016	.796** (2.48)	0.015
LAQ	-		.003*** (3.36)	0.001	-		-	
FI	-		.004** (2.16)	0.031	.025*** (4.39)	0.000	-	
DEM	-		- 1.176*** (-2.87)	0.004	-		- 12.720*** (-4.86)	0.000
PCI	.120*** (7.32)	0.000	.126*** (6.51)	0.000	-		.155** (2.19)	0.031
IFDIHorizontal	5.495*** (3.54)	0.000	-		2645.868** (2.02)	0.044	-	
IFDIBackward	-8.943* (-1.81)	0.071	-6.898* (-1.85)		- 3436.606** (-2.03)	0.044	-	

Independent Variables	Low technology level		Medium-Low technology level		Medium-High technology level		High technology level	
	Random effect (1)		Random effect (2)		Random effect (3)		Random effect (4)	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
IFDIForward	-		-		786.867** (2.03)		-	
IFDIHoriz*LAQ	-.045** (-2.49)	0.013	-		-		-	
Obs.	2,299		1,515		266		115	
R-squared	0.1627		0.1589		0.2157		0.4535	
Adj R-squared	0.0432		0.1510		0.1719		0.3892	

Notes: *, ** and *** indicate statistically significant at the 10%, 5% and 1% respectively.
        Standard errors are in parentheses.
Source: Authors calculated from annual enterprise survey data conducted by General Statistics
        Office of Viet Nam

The results in Table 2 show that while the presence of foreign firms generates a positive effect on the export of intra-industry domestic firms in low and medium-high technology industries, domestic firms in industries of medium-low and high technology are not influenced by the competition from foreign firms. This finding is consistent with the hypothesis that the competition effects imposed by foreign firms differ across industries. Domestic firms operating in low-technology industries like textiles and clothing seem to be damaged by the competition effect since the success of these kinds of firms depends on market and input costs. Conversely, domestic firms in industries whose products involve higher technological levels have stronger abilities to compete with foreign firms. There is a negative and significant effect of backward linkages on the export of low- and medium-technology industries. The interactions between labour quality and the horizontal spillover variable are negative and significant. This means that the increase in labour costs may reduce the spillover effects of FDI on domestic firms.

The size of domestic firms can be linked to their capacity to obtain the benefits associated with the presence of foreign firms. Small firms measured in terms of employment or production may not have a sufficient production scale to imitate or adopt technologies introduced by foreign firms. We examine the impact of firm size on the existence of export spillovers by considering three types: large firms, small and medium firms, and micro firms. A large firm is defined as one with more than 100 employees, and a small and a medium firm is one with more than 10 and less than 100 employees. A micro firm is defined as one with less than 10 employees.

The results shown in Table 3 indicate that both large firms and small-medium firms benefit from export spillovers from FDI in the same industries, whereas micro firms are negatively affected by the presence of foreign firms. This proves that when the size of enterprises is too small, the presence of FDI enterprises makes it difficult for micro enterprises to compete with FDI enterprises in exporting. There is a positive and significant effect of backward linkages on the export of micro firms, while there is a negative and significant effect of forward linkages on the export of small-medium firms. These effects are related to domestic firm size, financial capability, and labour quality. Large firms and small-medium firms are big and good enough to be input suppliers to FDI firms; thus, the exports of these domestic firms decrease when they focus on supplying inputs to FDI firms in the domestic market.

Table 3: The Impact of Firm Size on Export Spillovers

Dependent variable: Export of Domestic Firms

Independent Variables	Micro enterprise		Small and Medium enterprise (SMEs)		Large enterprise	
	Random effect (1)		Random effect (2)		Random effect (3)	
	Coef.	P>|t|	Coef.	P>|t|	Coef.	P>|t|
logLAB	-		.914*** (10.2)	0.000	.721*** (3.69)	0.000
logCAP	-		.124** (2.10)	0.036	.254** (2.24)	0.026
LAQ	.004*** (3.42)	0.001	.001** (1.96)		-	
DEM	-		-		-1.544*** (-2.84)	0.005
PCI	.335*** (4.75)	0.000	.108*** (7.78)		.156*** (6.30)	0.000
IFDIHorizontal	-13.700*** (-2.69)	0.008	2.716*** (3.12)		2.770* (1.80)	0.072
IFDIBackward	6.250* (1.94)	0.053	-		-	
IFDIForward	-		-2.448** (-2.20)		-	
IFDIHoriz*LAQ	.105*** (2.94)	0.004	-.017** (-2.00)		-	
IFDIForw*LAQ	-.119*** (-2.89)	0.004	.024** (2.05)		-	
Obs.	210		3005		980	
R-squared	0.1809		0.0865		0.1059	
Adj R-squared	0.1265		0.0124		0.1056	

*Notes: *, ** and *** indicate statistically significant at the 10%, 5% and 1% respectively.*
  Standard errors are in parentheses.

Source: Authors calculated from annual enterprise survey data conducted by General Statistics Office of Viet Nam

7. Conclusions

This study measures export spillovers from FDI to domestic firms in the manufacturing industry in Viet Nam. Using firm-level panel data for the period 2010-2016, the results reveal that export spillovers from FDI to domestic firms in the manufacturing industry in Viet Nam appear through both horizontal and vertical linkages.

The empirical results provide evidence that the horizontal effect is the most important channel for export spillovers from FDI to domestic firms. The presence of FDI firms is examined to bring export market information and improve the export production capacity of domestic firms through some channels such as labour mobility, technology transfer, and training workers in the same industries. Domestic firms in industries with backward linkages with foreign firms gain negative export spillovers. This implies that the more local enterprises focus their resources on supplying inputs to FDI enterprises,

the less export spillover from FDI in the industry will be, because focusing on input supply for FDI enterprises will reduce their resources for export activities.

The empirical results also provide evidence that export spillovers from FDI are different according to the technology levels of industries and the size of enterprises. The horizontal effect is positive in low and medium-high industries and in small, medium, and large firms, whereas it is negative in micro firms. The backward linkage spillover from FDI on export is negative in all technology levels of industries, while it is positive in micro firms. Based on the empirical results, several policy implications can be drawn for both the government and domestic firms.

First, the number of small and medium-sized enterprises in the manufacturing industry in Viet Nam accounts for more than 90% of the total number of enterprises in the industry; large enterprises focus mainly on state-owned enterprises and FDI enterprises. Most enterprises only have 25% of their own capital; the rest must be mobilized from outside at high interest rates, so it is difficult to invest in innovation, production technology, and training to improve the quality of their human resources. In recent years, the input production costs of enterprises have increased. Profits are tight, so this difficulty is even greater. This shortage of capital leads to many difficulties in accessing new advanced technology in production, training skilled human resources, accessing export markets, etc. Thus, increasing capital for   small and medium-sized enterprises is urgent to be able to enhance the positive export spillover effects of FDI in the industry. We recommend a government's adjustment of financing policies to support small and medium-sized enterprises, such as lowering loan interest rates, restructuring debt repayment terms, and loosening the credit room in a flexible, reasonable, and transparent manner, to support these firms in accessing loans.

Second, increasing the linkages between foreign firms and domestic firms is highly relevant to the encouragement of export spillovers from FDI. Domestic firms are encouraged to actively seek foreign partners for business cooperation. Moreover, through the activities of FDI management agencies, trade and investment promotion organizations, technology exhibitions, seminars, etc., FDI firms get more information about domestic production, which assists FDI firms in connecting with domestic firms.

Third, to maximize positive export spillovers from FDI, domestic firms should engage in increasing labour quality, financial capability, and technology level. Thus, R&D subsidies should be accompanied by the promotion of attracting FDI inflows. Education and training enhancement between research institutes, local training centres, and foreign firms is also important. This can be done through the introduction of government-funded programs for exchanges of expertise between research institutes, universities, and enterprises. Last but not least, it may be beneficial for the government to target oligopolistic industries to attract FDI because the benefits of export spillovers from FDI to domestic firms will be greater provided that domestic firms possess competitiveness in research activities.

References

Abraham, F. (2010). FDI spillovers in the Chinese manufacturing sector: Evidence of hetoreneity. *Economic Transition*, *18(1)*, 143-182

Anwar, S. & Nguyen, P.L (2010). Foreign direct investment and export spillovers: Evidence from Viet Nam. *International Business Review*, *20(2)*, 177–193.

Arif-Ur-Rahman, M., Inaba, K. (2021). Foreign direct investment and productivity spillovers: a firm-level analysis of Bangladesh in comparison with Vietnam. *Economic Structures,* 10 (17).

Barrios, S., Görg, H., & Strobl, E. (2003). Explaining firms' export behaviour: R&D, spillovers, and the destination market. *Oxford Bulletin of Economics and Statistics*, *65*(4), 475-496.

Barrios, S., Görg, H., & Strobl, E. (2011). Spillovers through backward linkages from multinationals: Measurement matters!. *European Economic Review*, *55*(6), 862-875.

Bernard, A.B. & Jensen, J.B. (2004). Why some firms export. *The Review of Economics and Statistics*, *86(2)*, 561-569.

Blalock, G., & Gertler, P. J. (2008). Welfare gains from foreign direct investment through technology transfer to local suppliers. J*ournal of International Economics*, 74(2), 402–421.

Bournakis, I. (2021). Spillovers and productivity: Revisiting the puzzle with EU firm level data. *Economics Letters*, *201,* 109804

Buckley, P. J., Wang, C., & Clegg, J. (2010). The impact of foreign ownership, local ownership and industry characteristics on spillover benefits from foreign direct investment in China. In Buckley, P. J, Foreign Direct Investment, *China and the World Economy* (pp.305–326). London: Palgrave Macmillan

Chen, C., Sheng, Y., & Findlay, C. (2013). Export spillovers of FDI on China's domestic firms. *Review of International Economics*, *21(5),* 841–856.

Chen, N., Chen, H. C., & Lin, R. S. (2020). FDI, exports and export spillover in Taiwan's electronics industry. *Journal of the Asia Pacific Economy*, *27(1),* 26–63.

Chen, T., Kokko, A., & Tingvall, P. G. (2011). FDI and spillovers in China: Non-linearity and absorptive capacity. *Journal of Chinese Economic and Business Studies*, *9(1),* 1–22.

Cheung, K. & Lin, P. (2004). Spillover effects of FDI on innovation in China: Evidence from the provincial data. *China Economic Review*, *15(1)*, 25– 44.

Ciani, A., & Imbruno, M. (2017). Microeconomic mechanisms behind export spillovers from FDI: Evidence from Bulgaria. *Review of World Economics*, *153(4),* 703–734.

Damijan, J., Knell, M. S., Majcen, B., & Rojec, M. (2003). Technology transfer through FDI in top-10 transition countries: How important are direct effects, horizontal and vertical spillovers?. *SSRN Electronic Journal*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=404241

Dao, T.H.N., & Sun, S. (2012). FDI and domestic firms' export behaviour: Evidence from Viet Nam. T*he Economic Society of Australia*, *31(3),* 80-390

Djankov, S., & Hoekman, B. (2000). Foreign investment and productivity growth in Czech enterprises. *World Bank Economic Review*, *14(1)*, 49–64.

Ebghaei, F., & Akkoyunlu Wigley, A. (2018). The role of exports in the transmission of horizontal and vertical spillovers of foreign direct investment: The case of Turkish manufacturing industry. *The Developing Economies*, *56(1),* 35–50.

Franco, C. & Sasidharan, S. (2010). MNCs, technological efforts and channels of export spillover: An analysis of Indian manufacturing industries. *Economic Systems*, *34(3)*, 270–288.

Franco, C. (2013). Exports and FDI motivations: Empirical evidence from U.S. foreign subsidiaries. *International Business Review*, *22(1),* 47-62.

Girma, S., Görg, H., & Stepanok, I. (2020). Subsidies, spillovers and exports. *Economics Letters, 186,* 108840.

Girma, S., Görg, H., & Pisu, M. (2008). Exporting, linkages and productivity spillovers from foreign direct investment. *Canadian Journal of Economics/Revue Canadienne D'économique*, *41(1),* 320–340.

Girma, S., Görg, H., & Stepanok, I. (2020). Subsidies, spillovers and exports. *Economics Letters*, *186,* 108840

Girma, S., Greenaway, D., & Wakelin, K. (2001). Who benefits from foreign direct investment in the UK?. *Scottish Journal of Political Economy*, *48(2),* 119–133.

Giroud, A., Jindra, B., & Marek, P. (2012). Heterogeneous FDI in transition economies– A novel approach to assess the developmental impact of backward linkages. *World Development*, *40(11),* 2206-2220.

Görg, H., & Seric, A. (2016). Linkages with multinationals and domestic firm performance: The role of assistance for domestic firms. *The European Journal of Development Research*, *28(4),* 605-624.

Greenaway, D. & Kneller, R. (2008). Exporting, productivity and agglomeration. *European Economic Review*, *52(5),* 919-939

Greenaway, D., Sousa, N., & Wakelin, K. (2004). Do domestic firms learn to export from multinationals?. *European Journal of Political Economy*, *20(4),* 1027-1043.

Hamida, B.L. (2011). FDI and spillovers in the Swiss services/construction industry: Interaction effects between spillover mechanisms and domestic technological characteristics. *International Business Review*, *7(3)*, 224-249.

Haskel, J. E., Pereira, S. C., & Slaughter, M. J. (2002). Does inward foreign direct investment boost the productivity of domestic firms?. *National Bureau of Economic Research. Working Paper* No. 8724.

Hu, C., & Tan, Y. (2016). Export spillovers and export performance in China. *China Economic Review*, *41(C)*, 75-89.

Javorcik, B. S. (2004). Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *American Economic Review*, *94(3),* 605–627.

Jin, Y., Chen, C., & Shi, Z (2021). Spillover effect of FDI on food exports: Based on firm-level analysis in China. *Sustainability*, *13(9),* 1-21.

Jude, C. (2015). Technology spillovers from FDI. Evidence on the intensity of different spillover channels. *The World Economy*, *39(12),* 1947–1973.

Karpaty, P., & Kneller, R. (2011). Demonstration or congestion? Export spillovers in Sweden. *Review of World Economics*, *147(1),* 109-130.

Kathuria, R. (2000). Telecom policy reforms in India. *Global Business Review*, *1(2),* 301–326.

Kim, M. (2015). Productivity spillovers from FDI and the role of domestic firm's absorptive capacity in South Korean manufacturing industries. *Empirical Economics*, *48(2),* 807–827.

Kim, M., & Xin, D. (2021). Export spillover from foreign direct investment in China during pre- and post-WTO accession. *Journal of Asian Economics*, *75(1),* 101337

Kinoshita, Y. (2000). R&D and technology spillovers via FDI: Innovation and absorptive capacity. *SSRN Electronic Journal*. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=258194

Kneller, R., & Pisu, M. (2007). Industrial linkages and export spillovers from FDI. *World Economy*, *30(1),* 105-134.

Koenig, P., Mayneris, F., & Poncet, S. (2010). Local export spillovers in France. *European Economic Review*, *54(4),* 622–641.

Kohpaiboon, A. (2006). Foreign direct investment and technology spillover: A cross-industry analysis of Thai manufacturing. *World Development*, *34(3)*, 541-556.

Kokko, A., Zejan, M., & Tansini, R. (2001). Trade regimes and spillover effects of FDI: Evidence from Uruguay. *Review of World Economics*, *137(1)*, 124–149

Konings, J. (2001). The effects of foreign direct investment on domestic firms: Evidence from firm-level panel data in emerging economies. *Economics of Transition*, *9(3),* 619-633.

Kutan, A.M., & Vuksic, G. (2 007). Foreign direct investment and export performance: Empirical evidence. *Comparative Economic Studies*, *49(3),* 430-445

Liu, X., Siler, P., Wang, C., & Wei, Y. (2000). Productivity spillovers from foreign direct investment: Evidence from UK industry level panel data. *Journal of International Business Studies*, *31(3)*, 407-425.

Lu, Y., Tao, Z., & Zhu, L. (2017). Identifying FDI spillovers. *Journal of International Economics*, *107(C),* 75-90.

Marin, A., & Bell, M. (2006). Technology spillovers from foreign direct investment: An exploration of the active role of MNC subsidiaries in the case of Argentina in the 1990s. *Journal of Development Studies*, *42(4)*, 678-697.

Mei, J. C. (2021). Refining vertical productivity spillovers from FDI: Evidence from 32 economies. *International Review of Economics & Finance*, *74(July 2021)*, 176–191.

Moralles, H.F., & Moreno, R. (2020). What is the name of the article?. *International Review of Economics & Finance*, *70(November 2020),* 257-272

Naudé, W., & Szirmai, A. (2012). The importance of manufacturing in economic development: Past, present and future perspectives. *MERIT Working Papers* 2012-041, United Nations University - Maastricht Economic and Social Research Institute on Innovation and Technology (MERIT).

Newman, C., Rand, J., Talbot, T., & Tarp, F. (2015). Technology transfers, foreign investment and productivity spillovers. *European Economic Review*, *76(May 2015)*, 168-187.

Pack, H., & Saggi, K. (2001). Vertical technology transfer via international outsourcing. *Journal of Development Economics*, *65(2),* 389-415.

Richard, K., & Pisu, M. (2007). Industrial linkages and export spillovers from FDI. *World Economy*, *30(1),* 105–134.

Ruane, F., & Sutherland, J. (2005). Foreign direct investment and export spillovers: How do export platforms fare?. *Institute for International Integration Studies Working Paper No. 58,* 21-34.

Sahoo, P., & Dash, R.K. (2022). Does FDI have differential impacts on exports? Evidence from developing countries. *International Economics*, *172(December 2022)*, 227-237.

Sarker, B., & Serieux, J. (2022). Foreign-invested and domestic firm attributes and spillover effects: Evidence from Brazil. *Journal of Multinational Financial Management*, *63(March 2022)*, 100719

Sherif, R., Adjasi, C. K. D., & Graham, M. (2022). Gender spillovers in foreign direct investments: An analysis of Namibia. *Thunderbird International Business Review*, *64(4),* 273–284.

Sinani, E., & Meyer, K. E. (2004). Spillovers of technology transfer from FDI: The case of Estonia. *Journal of Comparative Economics*, *32(3),* 445–466.

Tanaka, T. (2015). Foreign investors and corporate social responsibility: Evidence from the career advancement of women in Japan. *Applied Economics*, *47*(33), 3510–3524.

Tang, Y., & Zhang, K.H. (2016). Absorptive capacity and benefits from FDI: Evidence from Chinese manufactured exports. *International Review of Economics & Finance*, *42(March 2016), 4*23-429.

Todo, Y., Zhang, W., & Zhou, L. (2009). Knowledge spillovers from FDI in China: The role of educated labour in multinational enterprises. *Journal of Asian Economics*, *20(6)*, 626–639.

Tomohara, A., & Yokota, K. (2006). Does foreign direct investment benefit domestic companies via increased productivity: Horizontal, backward, and forward linkages. *The International Centre for the Study of East Asian Development, Kitakyushu Working Paper Series* Vol. 2006-07. Retrieved from https://www.agi.or.jp/media/publications/workingpaper/WP2006-07.pdf

Xu, X., & Sheng, Y. (2012). Productivity spillovers from foreign direct investment: Firm-level evidence from China. *World Development*, *40(1),* 62-74.