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Foreign entrants and domestic entrepreneurship: Evidence from Vietnam

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Abstract

This paper examines the impacts of foreign entrants and international trade on potential entrants in Vietnam. Based on a discrete entry model, estimates show that foreign direct investment (FDI) stimulates more domestic entrants in the short run, while the aggregate effect of FDI varies across FDI types. Horizontal FDI tends to have no impact on local start-ups while vertical FDI is found to have a positive impact on the inflow of domestic entry for only the backward linkage and not for the forward linkage. Moreover, industries with more exports accommodate more domestic entrants, whereas imports tend to deter domestic start-ups.

KEYWORDS

FDI, start-up, entry, export, Vietnam

JEL CLASSIFICATION

F14; F21; F23; F61; L26

1 | INTRODUCTION

Entrepreneurship is recognized as a key driver of economic growth; hence various enterprise development policies have purposed to promote the development of start-ups across countries, depending on those countries' stages of economic development (Acs & Szerb, 2007). For developing countries, human capital, technology availability, and financial access may prevent local entrepreneurship from flourishing. Attracting foreign direct investment (FDI) therefore, becomes one vital economic strategy for the economic growth of developing countries. FDI can create jobs, bring new knowledge and technologies, and generate productivity spillover effects.

From the entrepreneurship perspective, the interdependence between foreign entry through FDI and domestic entrepreneurship is an important research question and policy issue. FDI has two opposing

effects on domestic entry. Foreign firms can discourage entry of domestic firms by raising the degree of competition in input and product markets, as well as by raising technological barriers to entry, thereby causing a crowding-out effect (Grossman, 1984; Caves, 1996; Markusen & Stahler, 2011).

Alternatively, foreign firms might generate demand for intermediate goods and local products and services, creating a production linkage effect (Markusen & Venables, 1999). Blomström and Kokko (1998) also claim that FDI can create forward and backward linkages by providing technology information to relevant local networks. Demand creation and linkage effects are complementary to the local industry and encourage more domestic firms' entry into the markets, creating a crowding-in effect (Ayyagari & Kosová, 2010). This can result from both horizontal and vertical FDI. Meanwhile, the presence of export-oriented FDI (generally vertical FDI) also generates an export spillover effect that fosters exportation by local firms (Aitken, Hanson, & Harrison, 1997; Anwar & Nguyen, 2011; Kneller & Pisu, 2007; Mayneris & Poncet, 2015; Farla, De Crombrugghe, & Verspagen, 2016). If the market expansion effect for both domestic and international markets is strong enough, then the crowding-out effect is probably dominated by the market creation effect, leading to a crowding-in effect even in the short term.

Clarifying the role of FDI presence in shaping industry dynamics is particularly relevant to developing economies. Industrial development in host developing countries may be hampered by the dominance of the crowding-out effect brought about by FDI over the corresponding crowding-in effect. Foreign firms with higher productivity have stronger power to dominate the market; and the outflow or reallocation of FDI weakens industrial competitiveness if domestic firms cannot raise their technological capability. This subject however, remains less well examined.

Vietnam, a transition economy, provides a typical case for the investigation of this issue in developing countries. Like Central and East European transitional economies (CEETEs), China, and other Southeast Asian developing countries, Vietnam has been attracting increased inflow of FDI since the mid-1990s. For example, the FDI amount increased from U.S.$2,283 million in 1999 to U.S.$ 23,108 million in 2009. Meanwhile, Vietnam made a major amendment on the Enterprises Act in 1999 that removed most restrictions on the establishment of private firms, in order to facilitate its growth towards a more market-oriented economy. Thus, Vietnam's economy performed extremely well, with a 6.8% GDP growth per annum from 1990 to 2014. Two of the most conspicuous changes in Vietnam are large increases in both international trade and activities by foreign-owned multinational corporations (MNCs). As depicted in Figure 1, manufactured exports were only U.S.$4.053 billion in 1995 but this figure increased sharply to U.S.$79.380 billion in 2012. The corresponding contribution of exports to the GDP rocketed from 26.28% in 1995 to 73.80% in 2012, highlighting the importance of exports to the Vietnam economy's economic development.

Expansion into the international market can help increase the number of firms that can be accommodated in an industry. For Vietnam, MNCs' activities accounted for a stably increasing share of manufacturing output, reaching 47.2% in 2012. As a result of the implementation of the Enterprises Act in 1999, domestic private firms (not including state-owned enterprises) have played an emerging role in the manufacturing sector, accounting for 38.8% of manufacturing output in 2010, which subsequently portrayed a slight decrease. The trends of the contributions of shares of both MNCs and private firms to the manufacturing output seem to suggest a complementary relationship between FDI and domestic entrepreneurships.

The purpose of this paper was to investigate the impacts of FDI and international trade on private entrepreneurs in Vietnam, aiming to add to the empirical literature in several ways. First, under international production fragmentation, the inflow of FDI causes a spillover effect by promoting the expansion of domestic firms into international markets and creation of an intermediate goods domestic market. The shifts in the product market and support for an intermediate goods industry can

incentivize more private entrepreneurs. Apart from the short-term effect of FDI, which is measured as the number of foreign start-ups in the country annually, the possible long-run spillover effect of foreign presence is also measured using the stock measure of FDI. This study further differentiates FDI into horizontal FDI (HFDI) and vertical FDI (VFDI), that is, within-industry and inter-industry FDI, then examines their potential differences in affecting domestic entrepreneurships. We further differentiate VFDI into forward linkage and backward linkage, enabling us to understand how foreign firms purchasing from and selling to firms in other industries affect local entrepreneurship.

Secondly, we examine the impacts of international competition, whether exports or imports, on domestic entrepreneurships in Vietnam. As international trade is one of the main driving forces of this nation's economic growth, it inevitably influences the dynamics of the market structure. Defining the market from a global viewpoint, exports allow domestic firms to expand the size of their markets, thereby accommodating more firms. In contrast, domestic firms may suffer tough competition from imports as imported products might have competitive advantages in terms of price and/or quality.

Thirdly, we provide new evidence on the roles of FDI in influencing domestic entrepreneurs in Vietnam. While there are some relevant studies for developing countries, they generally focus on CEETEs and find inconsistent results. The Asian development model relies heavily on export-led growth through attracting FDI, implying a potentially different role played by MNCs on defining the dynamics of domestic firms. This study intends to deepen the understanding of the entry process of Vietnam's manufacturing sectors and to provide insightful implications to other developing countries that are moving towards global production fragmentation under the same circumstances.

Fourth and finally, instead of using the entry rate as a measure of domestic entrepreneurs, we use the number of entering firms as the entry variable to investigate the determinants of domestic entry,

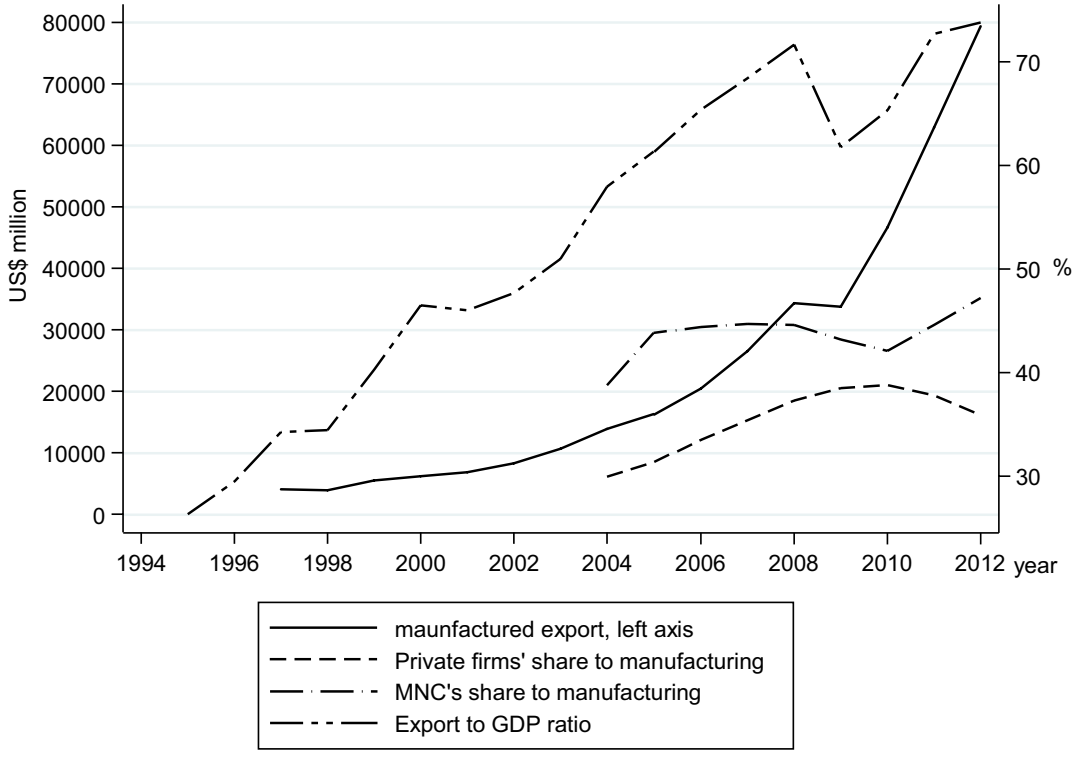

FIGURE 1 Openness, MNCs, and economic growth in Vietnam (%)

particularly the influence of FDI. The entry rate could be a measure of industrial dynamics but is not an adequate one when the number of firms is limited. The entry rate also seems difficult to explain using profitability and entry barriers (Geroski, 1995, p. 430). Since the number of entrants is an integer value, it suggests that the statistical specification of net entry calls for a discrete probability distribution (Chappell, Kimenyi, & Mayer, 1990; Mayer & Chappell, 1992), particularly for industries with a limited number of entrants annually.[1] This study adopts the technique of a count data model to examine the effects of FDI on domestic start-ups by using the number of firms entering an industry as the entry variable.

Based on a panel dataset of a four-digit manufacturing industry for the period of 2001 to 2005, the empirical results obtained by using the count data model show that FDI has a positive effect on promoting both short-run and long-run entry of domestic entrepreneurship. Horizontal FDI has a slightly negative impact on a local start-up, whereas vertical FDI exerts a larger positive impact thereby attracting higher rates of domestic entry, particularly through backward linkage. A positive relationship between exports and the number of domestic entrants was observed, whereas imports tend to deter domestic start-ups.

The paper is organized as follows. The next section discusses the theoretical argument regarding how FDI affects domestic entrepreneurship and reviews empirical literature. Section 3 introduces the data and then offers a brief investigation on the distributions of entry rates and entry flows for Vietnam's manufacturing sectors. Section 4 presents the theoretical and empirical frameworks. Section 5 employs the technique of the panel count data model to estimate the entry behaviors and analyze the empirical results. Concluding remarks are summarized in the final section.

2 | HOW FDI AFFECTS DOMESTIC ENTREPRENEURSHIP: LITERATURE REVIEW

Does FDI facilitate or retard potential domestic entrants in host countries? From the theoretical perspective, Grossman (1984) first developed an occupational choice model that discusses firm starts-up in an open economy.[2] Assuming the inflow of FDI triggers tougher competition in the labor market by increasing the minimum wage, FDI discourages individuals from entrepreneurship, thereby generating a crowding-out effect. The inflow of FDI entails new competition not only in the labor market, but also inflows of capital and technology, which are exogenous to the conditions prevailing in the domestic market (De Becker & Sleuwaegen, 2003). Since MNCs have better production technology and are more capital intensive compared with local firms, they carve out the domestic input market at least in the short term and cause the number of domestic entrepreneurs to fall. In a monopolistic competition model developed by Navaretti and Venables (2004), this crowding-out effect also emerges if foreign and domestic firms have similar marginal costs in production but foreign firms have superior production technologies. In a fixed and endogenous domestic market structure, increasing the output of MNCs comes generally at the expense of market entry and exit of domestic firms (Markusen & Stahler, 2011). The above theories overall predict a crowding-out effect caused by foreign entrants.

While FDI may generate competition in the labor and final goods markets, both Rodriguez-Clare (1996) and Markusen and Venables (1999) model how MNCs stimulate the entry of local firms through linkage effects in developing economies. MNCs in downstream industries generally use intermediate goods intensively. When the communication cost between the headquarters and the production plant is high, and the variety of intermediate goods produced is not too broad between the home and host countries, MNCs need the support of local firms to provide intermediate goods and components. Thus, the linkage effect generated by MNCs is stronger, fostering the formation of local suppliers,

thereby inducing more domestic firms to enter related industries. However, if these conditions are reversed, then MNCs could even hurt the entrepreneurship in a developing economy by continuing to crowd out local firms. In other words, models developed by Rodriguez-Clare (1996) and Markusen and Venables (1999) consider both horizontal and vertical effects of FDI on local firms' entry and overall predicts a possible positive crowding-in effect.

Inspired by the inconsistent theoretical arguments, an emerging line of literature has empirically examined whether FDI crowds out or crowds in domestic start-ups. The limited studies reach contradictory findings. For advanced economies, De Backer and Sleuwaegen (2003) relate net entry rate to foreign entry to investigate these issues. Based on a pooling dataset of 129 three-digit manufacturing industries in Belgium for the period 1990 to 1995, they find that FDI discourages entry for Belgium firms in the short term, while the crowding-out effect may be moderated or even reversed in the long run owing to the long-term positive effects of FDI on domestic entrepreneurship. Although their censored estimation procedure accounts for zero cells in the dataset, industrial unobserved heterogeneity is not well dealt with in their pooling estimation. The Portugal case study conducted by Barbosa and Eiriz (2009) uses two measures of FDI: one is a dummy variable equaling one if there is presence of foreign-owned firms in an industry; the other is the ratio of employment in foreign-owned firms to total employment at industry level. Results obtained by using the generalized method of moments technique show that the impact of foreign investment is positive at first, while the marginal impact of additional investments appears to be negative.

Evidence from developing countries emerged in the past decade, and tends to support the crowding-in effect caused by the demand creation (linkage) brought about by FDI as theoretical arguments in Rodriguez-Clare (1996) and Markusen and Venables (1999). Ayyagari and Kosová (2010) examined the impact of FDI on domestic firm entry in the Czech Republic in the period 1994 to 2000. Measuring foreign presence by the share of industry sales captured by foreign firms in industries, they found out that a larger foreign presence is associated with a higher entry rate in a three-digit industry, indicating the existence of positive horizontal spillovers from FDI. Using an input–output (IO) table to separate FDI into backward and forward linkages, both types of FDI facilitate entry only for service industries, but not for manufacturing industries. The positive crowding-in effect has also been evidenced in China. Based on four-digit industry-level panel data over the period 2003 to 2007, and using the output share of foreign firms in an industry as the indicator of foreign presence, Anwar and Sun (2012) found that FDI originating from the rest of the world (other than FDI from Hong Kong, Macau, and Taiwan, HMT) is positively related to the entry rate of domestic firms, whereas FDI originating from HMT has contributed to an increase in the exit rate of domestic firms. Moreover, the spillover effect of FDI arising from backward linkages is also positive and significant.[3]

Reviewing the literature, the limited evidence from developing countries suggests the need for more empirical studies. More importantly, the global production fragmentation circumstances imply that we have to consider the effects of FDI on domestic entrepreneurship in terms of short-run and long-run effects, as well as backward and forward linkages. Underpinned by a game theoretic model of entry, our empirical evidence can shed new insights into this line of literature.

3 | DATA SOURCE AND MARKET ENTRY IN VIETNAM'S MANUFACTURING SECTOR

The dataset utilized is plant-level panel data for Vietnam from the Annual Economic Census (AEC) for years 2000 to 2005. The AEC survey was conducted by the General Statistical Office (GSO) of Vietnam since 2000 after the Enterprises Act simplified the process for the establishments of private

firms. The questionnaire contains basic information on firms, such as firm identification, industry code, and ownership types, helping us identify domestic and foreign entrants and exiters, and construct an industry-level panel dataset and FDI variables. The dataset is a good representation of the entire economy.

The availability of qualified micro-level data is the main obstacle to conducting empirical analyses for developing countries. Although the dataset is not updated for other years besides 2000 to 2005, it remains an adequate set for several reasons. First, the registered number in AEC switched from firm identification to the taxation number in 2006, preventing us from compiling new entrants' codes for 2006 and onward. Moreover, comparing several numbers between those reported by the GSO and those gleaned from the dataset, we obtained consistent statistics, suggesting that the quality of the 2000 to 2005 dataset is reliable. Secondly, using this dataset helps to avoid substantial macroeconomic shocks in Vietnam's 2007 WTO accession and the 2008 to 2009 global financial crisis. Thirdly, this dataset might also be relevant to the 2010s, because the inflow of FDI exhibited a stably increasing trend between 2000 and 2015 with slight exceptions over the period 2007 to 2009 when subjected to Vietnam's WTO accession and the global financial tsunami.[4]

The process of data construction is as follows. Based on the industry code reported by individual firms, we classify each firm into the four-digit industry it locates (130 industries per year) and then construct a four-digit industry-level panel dataset for the 2001 to 2005 period. Then, using the unique firm identification and a firm's ownership type to identify new entrants, this study counts the number of domestic entrants and foreign entrants, and calculates the entry rate in each four-digit industry. It also calculates the output share contributed by MNCs in each four-digit industry. Finally, because of the lack of trade information in the GSO firm survey, the study adopted the concordance table between International Standard Industrial Classification (ISIC) and Standard International Trade Classification compiled by Muendler (2009) to sort out each four-digit industry's trade value by referring to the UN Comtrade database.

As indicated in Table 1, the number of manufacturing firms in Vietnam increased sharply and stably from 10,405 in 2000 to 23,384 in 2005, accompanied by an average of more than 5,000 entrants annually. The numbers in column (3) show a considerable variation in entry rates in the manufacturing sector across the year. As there was a sudden boom in entrants after the start-up restrictions on private firms was lifted in 2000, the entry rate went as high as 53.12% in 2001. It then declined and hovered between 28.02% and 36.03% in subsequent years, reaching an average of 35.24% during 2001 to 2005. The entry rate for Vietnam's manufacturing sector is extraordinarily higher than that of other countries. For instance, the entry rate in European countries hovered between 5.9% and 20.1% in the 1990s (De Backer & Sleuwaegen, 2003). The transition economy of the Czech Republic only experienced an average entry rate of 8.03% during the period of 1994 to 2000 (Kejzar, 2011).

Domestic entrants are naturally the newcomers who benefited from the amendment of the Enterprises Act. They account for 89.44% to 93.03% of total entrants in various years, as displayed in column (4). The number of foreign entrants remained stable with an average of 438 firms annually across 2001 to 2005, accounting for a ratio of lower than 10% of the total entrants on average.

As mentioned previously, this study will use the number of domestic entrants as the measure of entrepreneurship and adopt count data model for implementing empirical estimations. It suggests that the number of entrants within an industry should be a small integer value, even zero. Although Vietnam is not a small country (with a population of around 80 million in 2001), there is evidence to this situation. As indicated in Table 2, there are 43 to 50 industries with less than 10 entrants across 130 industries in various years, accounting for 32.85% to 37.06%. Actually, there are also about four industries without foreign presence each year.[5] If we look at industries with less than 50 domestic

TABLE 1 Ownership distribution of manufacturing entrants in Vietnam, 2001–2005

Year	Number of firms (1)	Number of entrants (2)	Entry rate (%) (3)	Foreign firms (4)	Domestic firms (5)
2000	10,405				
2001	13,232	5,527	53.12	605	5,122
				(10.56%)	(89.44%)
2002	14,773	3,707	28.02	292	3,411
				(7.89%)	(92.11%)
2003	16,885	4,554	30.83	416	4,138
				(9.13%)	(90.87%)
2004	20,494	6,083	36.03	424	5,659
				(6.97%)	(93.03%)
2005	23,384	5,780	28.20	451	5,329
				(7.80%)	(92.20%)
Total		25,651		2,188	23,463

Note: Entry rate is measured by the ratio of the number of entrants in year t to total firms in year $t-1$.

Source. Calculated by the authors based on the GSO firm survey.

entrants, they account for almost 74% of all industries in average. Therefore, using the count data model technique to examine the influence of FDI on domestic entrepreneurship is appropriate.

Moreover, the count of entrants varies substantially across four-digit industries, ranging from 0 to 671. Indeed, there are only a few industries attracting more than 500 new entrants every year, such as the manufacturing of food products and the textile and wearing apparel industries. It implies that industry characteristics play important roles on attracting new firms. We also find an increasing average number of domestic start-ups in the 2000 to 2005 period.

Given the lower total number of foreign entrants shown in Table 1, it is natural that the mean value of foreign entrants across four-digit industries is lower than that of domestic entrants, ranging between 2.68 and 6.03. Moreover, most industries (82.31%–93.08%) attract only fewer than 10 foreign entrants per year, whereas there is no industry attracting more than 100 foreign start-ups. The few annual foreign entrants in most industries seem to suggest that the short-term impact of FDI on domestic entrants might be inconsiderable, and one might therefore focus on the long-term relationship.

4 | EMPIRICAL SPECIFICATION AND ESTIMATING STRATEGY

4.1 | Empirical model

For entrepreneurs, the goal of establishing a new firm is to maximize profit. Incentive and deterrence factors are assumed to be relevant to entrepreneurs' decisions, including FDI. Borrowing the reduced-form second-stage profit function developed by Berry (1992), this study starts from the following additively separable components form:

$$\pi_{ijt} = X_{jt}\beta + f_i(\delta_i, Z_{jt}) + \varepsilon_{ijt}. \quad (1)$$

TABLE 2 Distribution for the number of entrants in four-digit industries

	2001		2002		2003		2004		2005	
Count	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**
<10	49	107	47	121	43	115	50	116	45	122
	(37.69%)	(82.31%)	(36.15%)	(93.08%)	(33.08%)	(88.46%)	(36.23%)	(89.23%)	(32.85%)	(89.05%)
$10 \leq N < 50$	50	21	54	8	59	14	50	13	50	14
	(38.46%)	(16.15%)	(41.54%)	(6.15%)	(45.38%)	(10.77%)	(36.23%)	(10.00%)	(36.50%)	(10.22%)
$50 \leq N < 100$	17	2	7	1	12	1	19	1	24	1
	(13.08%)	(1.54%)	(5.38%)	(0.77%)	(9.23%)	(0.77%)	(13.77%)	(0.77%)	(17.52%)	(0.73%)
$100 \leq N < 500$	14	0	12	0	16	0	18	0	16	0
	(10.77%)		(9.23%)		(12.31%)		(13.04%)		(11.68%)	
≥ 500	0	0	0	0	0	0	1	0	2	0
							(0.72%)		(1.46%)	
Observations	130	130	130	130	130	130	130	130	137	137
Maximum	372	90	255	57	368	89	506	62	671	58
Mean	46.31	6.03	29.90	2.68	44.03	4.61	51.82	3.96	59.44	4.77
Minimum	0	0	0	0	0	0	0	0	0	0
SE	73.5	11.2	48.3	6.25	68.4	9.66	89.1	7.82	110.9	9.34

Note: SE = standard error. Figures in parentheses are percentages.

Source. Author's calculations.

Here, π_{ijt} is the post-entry profit of firm i entering into industry j at time t.

The term X_{jt} is an industry-specific vector.[6] The additive component $f(\delta,Z)$ is an unspecified function of explanatory variables that aims to capture the effects of FDI and international trade. Because the inflow of FDI, imports, and exports are exogenous for potential entrants, we thus specify the unspecified function $f(\cdot) = Z_{jt}\gamma$.

A potential domestic entrant i will enter into industry j if $\pi_{ijt} \geq 0$. Firm heterogeneity in productivity induces firms to acquire different levels of profitability, leading to an equilibrium number of firms, N^*_{jt}, in industry j in a given year[7]:

$$N^*_{jt} = \max_{0\leq n\leq N_{jt}} \left\{ n:(X_{jt}\beta + Z_{jt}\gamma) \geq 0 \right\}. \tag{2}$$

Here, n takes a nonnegative integer value, and the total number of potential firms (N_{jt}) is a finite number. Let $N^*_{j,t-1}$ be the number of firms in industry j in the previous year, and $s \in [0,1]$ is the survival rate of those firms in the current period. Thus, the number of entrants in the current year is:

$$ENTRY_{jt} = N^*_{jt} - sN^*_{j,t-1} = \max_{0\leq n\leq PE_{jt}} \left\{ n:\pi_{jn}(n + sN^*_{j,t-1}) \geq 0 \right\}. \tag{3}$$

Here, *ENTRY* and *PE* are the numbers of actual and potential entrants, respectively.[8]

Based on Equations 1 to 3, we can relate the number of domestic entrants (*ENTRY*) to industry-specific characteristics (X) and the vector of variables Z, which is the main concern in this study, including FDI, exports, and imports. These variables might spur or deter potential domestic entrants. Therefore, we can specify the baseline model as:

$$\begin{aligned} ENTRY_{jt} = {} & \beta_0 + \beta_1 \ln MES_{j,t-1} + \beta_2 \ln KL_{j,t-1} + \beta_3 PCM_{j,t-1} + \beta_4 \ln SCALE_{j,t-1} \\ & + \beta_5 GR_{j,t-1} + \beta_6 DEXIT_{j,t-1} + \beta_7 FENTRY_{j,t-1} + \beta_8 \ln EXPORT_{j,t-1} \\ & + \beta_9 IMPORTER_{j,t-1} + u_j + \varepsilon_{jt}. \end{aligned} \tag{4}$$

Here, *ENTRY* is the number of domestic entrants in industry j in year t.

To mitigate the endogenous problem of covariates, we include all explanatory variables in the form of a 1-year lag, which is a common practice by many researchers—for example, De Backer and Sleuwaegen (2003) and Kosová (2010). Two entry barrier variables included are the ratio of the minimum efficient scale (*MES*) and the capital to labor ratio (*KL*). Geroski (1995) argues that MES is frequently measured by the median firm size, in terms of the number of employees in the industry, and this measure is also adopted in Sutton (1998)—this study thus adopts this measure. An industry with a higher *MES* denotes that it accommodates fewer firms that operate on the minimum efficient scale, thereby allowing fewer entrants to enter this industry. Term *KL* is the capital to labor ratio, which is measured by industrial fixed capital to total employment in an industry. It is a measure of the exogenous sunk cost, serving as a proxy for entry barrier. As *KL* increases, the capital requirement needed to enter an industry increases and then lowers the willingness of potential entrants to participate (Dunne, Roberts, & Samuelson, 1988). This is relevant to domestic entrants in Vietnam, as small- and medium-sized entrants tend to be more labor intensive and will be discouraged by the capital requirement. We thus expect *KL* to have a negative impact on entry flow.

High profit among incumbent firms is the main incentive that attracts potential entrants into an industry. We include the industry-wide price–cost margin (*PCM*), measured as industry profitability to sales, to capture this incentive. This positive incentive effect has been supported in literature (e.g., Austin & Rosenbaum, 1991; Ilmakunnas & Topi, 1999; De Backer & Sleuwaegen, 2003). Alternatively, Cowling and Waterson (1976) developed a theoretical rationale for expecting industry

profitability to be positively correlated with the level of concentration, and this relation implies that a high-profit industry might accommodate fewer newcomers, because concentration accounts for strategic entry deterrence. Two other characteristics affecting industry dynamics are the scale of industry (*SCALE*) and industry growth (*GR*), measured as industry sales and sales growth, respectively. An industry with a larger scale and higher growth potential accommodates and attracts more firms. Both variables are predicted to be positive in the entry equation.

DEXIT is the number of exiting domestic firms in the previous year. Foreign firms are generally larger and can set the market price, whereas small domestic firms generally have higher marginal costs and are inefficient (Kosová, 2010). Thus, small domestic firms are often forced to exit, while their vacancies may consequently attract potential entrepreneurships into the market.

FDI and international trade are the main covariates that the study is concerned about. Corresponding to the count measure of domestic start-ups, the short-run effect of FDI (*FENTRY*) is measured as the number of foreign entrants in the previous year. Based on the discussion in the previous section, most theoretical and empirical studies claim a negative impact, while its real effect should depend on the relative strength of the competition and the demand creating effect. A more liberalized environment of international trade also influences the industry dynamics for open economies. *EXPORT* is the total exports for each four-digit sector in the previous year. This variable is intended to control for the fact that an export-oriented industry may accommodate more entrants arising from the demand from the world markets. In contrast, *IMPORTR* is the ratio of imports to total sales in a four-digit industry in the previous year.[9] An increase in *IMPORTR* generates a tougher competitive pressure on domestic firms and lowers the incentives for potential domestic entrants in the short-run. It is thus expected to be negatively related to domestic start-ups.[10] Moreover, u and ε are unobserved industry heterogeneity and the error term, respectively.

Table 2 also shows that the count of foreign entrants is low in each year, suggesting that the influence of FDI on domestic entrepreneurship might take a long time as suggested in De Backer and Sleuwaegen (2003). Specifically, studies such as De Backer and Sleuwaegen (2003), Ayyagari and Kosová (2010), and Kokko and Thang (2014) highlight that horizontal and vertical FDI may have different impacts on domestic entry and exit. The competition effect brought about by HFDI is generally stronger than the demand creating effect, thereby executing a crowding-out effect; whereas VFDI can generate a stronger demand creating effect, thereby inducing more entrants. The inclusion of HFVI and VFDI can partly capture the difference in FDI knowledge transfer across industries, Equation 4 is thus extended as follows:

$$\begin{aligned} ENTRY_{jt} = {} & \beta_0 + \beta_1 \ln MES_{j,t-1} + \beta_2 \ln KL_{j,t-1} + \beta_3 PCM_{j,t-1} + \beta_4 \ln SCALE_{j,t-1} \\ & + \beta_5 GR_{j,t-1} + \beta_6 DEXIT_{j,t-1} + \beta_{71} FENTRY_{j,t-1} + \beta_{72} HFDI_{j,t-1} \\ & + \beta_{73} VFDI_{j,t-1} + \beta_8 \ln EXPORT_{j,t-1} + \beta_9 IMPORTER_{j,t-1} + u_j + \varepsilon_{jt}. \end{aligned} \tag{5}$$

The terms *HFDI* and *VFDI* are stock measures of horizontal FDI and vertical FDI, respectively. They are used to examine how various kinds of foreign presences in the same industry affect domestic entrepreneurship in the long run. The calculations for these two variables follow the measures in Javorcik (2004). HFDI measures the foreign presence in the firms' own four-digit industry j at time t and is calculated as follows:

$$HFDI_{jt} = \frac{\sum_f FDI_{fjt}}{OUTPUT_{jt}}. \tag{6}$$

Here, FDI_{fjt} are the outputs of foreign firm f at time t, while the denominator $OUTPUT_{jt}$ is the total output of all firms in industry j.

Regarding vertical FDI, it is further bifurcated into upstream (forward: from FDI to local buyers, *VFDI_forward*) and downstream (backward: from FDI to local suppliers, *VFDI_backward*). The two reflect transactions in which foreign firms purchase from domestic suppliers and foreign presence across upstream industries supplies inputs and intermediate goods to domestic firms, respectively. *VFDI_forward* and *VFDI_backward* are respectively calculated as the product of horizontal FDI in downstream and upstream industries weighted by the coefficients of IO table α_{jk} and its transposed matrix δ_{jk}.

$$VFDI\_forward_{fj} = \sum\nolimits_{k\ if\ k\neq j} \alpha_{jk} HFDI_{fj} \tag{7}$$

$$VFDI\_backward_{fj} = \sum\nolimits_{k\ if\ k\neq j} \delta_{jk} HFDI_{fj}. \tag{8}$$

Here, α_{jk} is the proportion of industry j's output supplied to industry k.

To calculate the inter-industry linkage of FDI, we use the Vietnam IO table to construct the weights. For Vietnam, IO tables are available for the years 2000 and 2007. The 2007 IO table was applied based on the following reasons. The IO table compilation refers to transactions across industries (sectors) in the previous few years. As the Vietnamese economy changed rapidly in the early 2000s, using the 2007 IO table might be more adequate than using the 2000 IO table. The compilation of 2007 IO table follows the 1993 System of National Accounts (SNA) of the United Nations and classifies industrial production into 138 commodities and 112 industries. One notable point is that the classification of 112 industries in 2007 differs from the 112 sectors of the IO table of 2000, enabling us to compile the four-digit manufacturing industries easily. Table 3 summarizes the definitions and basic statistics of variables included in the regression model.

4.2 | Estimating strategy

In the empirical specification of Equations 4 and 5, the dependent variable is the number of domestic entrants, which is a nonnegative integer with some numbers of zero value in each year. Thus, the Poisson family count data model is the appropriate one (Cameron & Trivedi, 1986). As the assumption of the Poisson model that the mean equals the variance generally does not hold (as displayed in the lower panel of Table 2), there are two methods to solve this problem. One is the negative binomial (NB) model that relaxes this assumption by allowing a variance that is larger than the mean (Cameron & Trivedi, 1986); the other is the pseudo-maximum likelihood (PML) estimator developed by Gourieroux, Monfort, and Trognon (1984) to correct estimated standard errors. Because there is no formal test to judge the adequateness between the NB model and PML-Poisson, reporting both results is a better strategy and ensures the robustness of estimating results. Specifically, variables with inconsistent estimates, in terms of significance, should be interpreted in a more conservative manner.

5 | EMPIRICAL RESULTS

5.1 | Baseline results

As a first step of the econometric analysis, we focus on the short-run effects of FDI and international trade. Table 4 shows a series of estimations on Equation 4. As there is no specific econometric test to judge the adequateness between the fixed effect of the panel Poisson using PML and the fixed effect of the panel NB model, we report both results in columns (1) to (2) and columns (3) to (4), respectively. To consolidate the adequateness of our count data approach, results obtained using the

TABLE 3 Variable definitions and basic statistics

Variables	Definitions	Mean (*SD*)
ENTRY	Number of domestic entrants in ISIC four-digit industries	47.750 (82.438)
MES	Minimum efficient scale: median employment size in the four-digit sector	150.282 (167.957)
KL	Capital intensity: total capital to labor ratio (million dong/employee)	249.453 (233.864)
PCM	Price–cost margin: industry profitability to sales (%)	31.168 (19.396)
SCALE	Industry scale: industrial sales (trillion dong)	2746.314 (5843.170)
GR	Industry growth: industrial sale growth (%)	240.730 (1122.721)
DEXIT	Number of domestic firms existing in the market in ISIC four-digit industries	29.113 (51.168)
FENTRY	Number of foreign entrants in VSIC four-digit industries	4.580 (9.255)
EXPORT	Exports in four-digit industries (US$ thousand)	3,970.665 (19,658.51)
IMPORTR	Ratio of imports of four-digit industry sales (%)	62.812 (131.333)
HFDI_sale	Horizontal FDI: output share of foreign firms in four-digit industry	0.313 (0.294)
HFDI_firm	Horizontal FDI: number share of foreign firms in four-digit industry	0.164 (0.155)
VFDI_Forward	Forward linkage of FDI: product of horizontal FDI in upstream industries weighted by IO table coefficients	0.343 (0.331)
VFDI_Backward	Forward linkage of FDI: product of horizontal FDI in downstream industries weighted by IO table coefficients	0.388 (0.383)

Note: The mean and standard deviation are calculated using 2000–2004 or 2001–2005 data.

TABLE 4 FDI, international trade, and domestic entrants in Vietnam

	Four-digit industry level				Three-digit industry level		
	Poisson-PML		Negative binomial		Poisson-PML	NB	Panel Tobit
	FE	FE	FE	FE	FE	FE	FE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ln*MES*	−0.197**	−0.238***	−0.220***	−0.230***	−0.350***	−0.406***	−0.394***
	(0.097)	(0.094)	(0.056)	(0.056)	(0.127)	(0.074)	(0.070)
ln*KL*	−0.083	−0.070	0.030	−0.028	−0.267	0.077	0.157**
	(0.138)	(0.142)	(0.055)	(0.055)	(0.193)	(0.078)	(0.074)
PCM	0.234	0.146	0.233**	0.189*	0.297*	0.285**	−0.128
	(0.163)	(0.176)	(0.096)	(0.102)	(0.158)	(0.124)	(0.230)
ln*SCALE*	0.150***	0.171***	0.107***	0.117***	0.172***	0.163**	0.191**
	(0.048)	(0.054)	(0.023)	(0.025)	(0.054)	(0.033)	(0.044)
GR	1.7e-04***	1.8e-04***	0.0001***	0.0001***	1.4e-04***	1.2e-04***	1.1e-04***
	(4.1e-05)	(4.4e-05)	(2.1e-05)	(2.1e-05)	(4.3e-05)	(2.6e-05)	(2.4e-05)
DEXIT	0.0016***	0.0016***	0.0019***	0.0019***	0.008***	0.0009***	0.0007
	(0.0006)	(0.0006)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0005)
FENTRY	0.010**	0.008**	0.011***	0.011***	0.010***	0.009***	0.015***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.002)	(0.003)	(0.005)
ln*EXPORT*	0.154***	0.191***	0.074***	0.083***	0.304***	0.061*	0.042*
	(0.040)	(0.056)	(0.023)	(0.024)	(0.061)	(0.032)	(0.026)
IMPORTR	−6.5e-05**	−6.0e-05*	−0.0001	−0.0001	−2.1e-04	−9.4e-05	−0.0001
	(3.0e-05)	(3.4e-05)	(0.0001)	(0.0001)	(2.2e-04)	(2.4e-04)	(0.0001)
Constant			0.682	0.565		1.406**	2.910**

(Continues)

TABLE 4 (Continued)

	Four-digit industry level				Three-digit industry level		
	Poisson-PML		Negative binomial		Poisson-PML	NB	Panel Tobit
	FE	FE	FE	FE	FE	FE	FE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
			(0.454)	(0.462)		(0.702)	(0.666)
Year dummy	No	Yes	No	Yes	No	Yes	Yes
Log pseudo likelihood	−2,475	−2,449			−1,398	−890	
Log likelihood			−1,630	−1,626			−271.53
Pseudo R^2	0.738	0.783			0.801		
No. of observations	607	607	607	607	310	310	310

Note: Figures in parentheses are standard errors. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$. In column (7), the dependent variable is ln(ENTRY + 1).

three-digit industry data are reported in columns (5) and (6). Moreover, if there are enough entrants in three-digit industries (with a mean of 93.79), it implies that it should not matter much whether the number of entrants is an integer. Thus, we also try to use the panel Tobit model to implement estimation, as displayed in column (7). Estimates are overall quite similar.

The influences of entry barrier variables are overall in accordance with our expectation and consistent with the results from extant studies. Entry counts are significantly related to the minimum efficient scale (*MES*). An industry with a higher value of *MES* allows fewer firms to operate at a minimum efficient scale, and such an industry naturally attracts fewer entrant firms, echoing the argument of Geroski (1995).[11] The estimated coefficient of *KL* is as expected to be negative, but not significant. A higher capital to labor ratio implies a high set-up cost and may deter the willingness of potential entrants to participate in the markets, while our result suggests that capital intensity seems to be less relevant to domestic entrants in Vietnam. Although this finding appears contrary to expectation, Kokko and Thang (2014) show an insignificant relationship between capital intensity and the survival of domestic firms in Vietnam.

As for the influences of incentive variables, the results are consistent with previous studies on gross entry, for example, Austin and Rosenbaum (1991), Ilmakunnas and Topi (1999), and De Backer and Sleuwaegen (2003). The numbers of entrants are larger in industries with a higher profitability, larger market size, and/or higher growth rate. The main objective of a firm is to maximize profit; therefore, profitability and growth are signals of opportunities open to potential entrants. The lagged exit variable (*DEXIT*) is associated with a significantly positive coefficient in all estimations. It reflects that the exit of less efficient incumbents provides room for potential entrepreneurs to enter this industry or to some extent of the replacement effect of more efficient entrants on less efficient incumbents. The finding is consistent with evidence from Belgium (De Backer & Sleuwaegen, 2003).

We find that *FENTRY* is associated with a significantly positive coefficient in all estimations, suggesting a crowding-in effect in which the inflow of foreign firms has a positive effect on the number of new domestic entrants. This finding is in contrast to theoretical prediction (e.g., Grossman, 1984; Navaretti & Venables, 2004) and the evidence from Belgium (De Backer & Sleuwaegen, 2003), providing new evidence for the literature on the FDI–domestic entrepreneur nexus. Vietnam is an emerging transition economy that attracted increasing FDI and experienced high economic growth in the 2000s. The inflow of FDI might generate a strong linkage effect even in the short run, thereby fostering more domestic start-ups. Another developing country, China, has also experienced a positive relationship between FDI and local entrepreneurship in the short run (Anwar & Sun, 2012). The estimate associated with *FENTRY* hovers at 0.01, implying that an increase of one more foreign entrant raises the entry flow by around 1%, *ceteris paribus*. The average number of domestic entrants in four-digit industries is 47.750, indicating the crowding-in effect of attracting 0.4775 more potential entrants in the short run. Though this effect of fostering entrepreneurship is small in the short run, the demand creation and spillover effect of FDI should be examined using the stock measure of FDI, as suggested in De Backer and Sleuwaegen (2003), Ayyagari and Kosová (2010), and Franco and Weche Gelübcke (2015).

Results in Table 4 demonstrate interesting findings for the effects of international trade on domestic entrepreneurs. The significantly positive coefficient of ln*EXPORT* supports our expectation that an industry with higher export sales accommodates more newcomers in an export-oriented transition economy. In the early stage of Vietnam's economic development, domestic private firms were smaller (Ngoc & Ramstetter, 2004), implying that the huge global market is attractive for new firms to undertake exports.

International competition from imports tends to have no significant impact on the formation of domestic entrepreneurs (or a minor negative effect), as the estimated coefficient on *IMPORTR* is

significantly negative only in columns (1) and (2) at the 10% statistical level. This insignificant influence (or lesser negative impact) is probably attributed to the composition of imports that production inputs used to consume; assembly exports might have positive or no influence on facilitating domestic entrants, whereas competing consumer goods generate a direct negative impact to deter potential entrants. Under the development of international production fragmentation, some of affiliates of MNEs and local firms in Vietnam generally undertake assembly exports that require importation of intermediate goods and materials. According to GSO statistics, manufactured materials accounted for 28.11% of imported manufactured goods in 2000 and this ratio increased steadily to 38.58% in 2005.[12] This increasing ratio of production inputs could lower the direct competition effect of imported final goods. Thus, imports have a lesser direct competition effect overall.[13]

Column (5) shows that the *R*-squared measure of the count data model proposed by Cameron and Windmeijer (1996) is about 0.8. It indicates that the included covariates explain 80% of the observed entry flow, whereby 20% of covariates can be explained as the higher bound of "entrepreneurship," as suggested in Grebel, Pyka, and Hanusch (2003).

5.2 | The Influences of HFDI and VFDI

Using the number of foreign entrants in the previous year (*FENTRY*), we so far consistently find a positive effect of net FDI on domestic start-ups in the short term. In this subsection we investigate the long-term effect of FDI using stock measures, as the negative competition effect and positive linkage and spillover effects take time to act and last a long time. As argued before, the effects of foreign presence on domestic entrepreneurship can exist within and between industries. Thus, FDI is further separated into horizontal FDI (HFDI) and vertical FDI (VFDI) as measured in Equations 3 to 6.

Estimates in columns (1) to (4) of Table 5 show the results by including only the intra-industry effect of FDI. In columns (1) and (2), HFDI is measured as the share of industry sales captured by foreign firms in a four-digit industry (*HFDI_sale*) as used by Ayyagari and Kosová (2010); whereas it is measured as the relative number of foreign firms in a four-digit industry (*HFDI_firm*) in columns (3) and (4), as used in De Backer and Sleuwaegen (2003). The regressions show that both *HFDI_sale* and *HFDI_firm* are overall associated with an insignificant coefficient, except for column (4), with a significantly negative coefficient at the 5% statistical level. This suggests that domestic entrepreneurship is less relevant to the cumulated sales share of foreign firms within the same industry in the long run, while it tends to have a competition effect in terms of cumulated numbers of foreign firms.[14] Our finding provides little support to the crowding-out effect as with theoretical predictions, but it is in contrast to the positive effect found in Belgium (De Backer & Sleuwaegen, 2003) and in the Czech Republic (Ayyagari & Kosová, 2010).

As discussed previously, two contrasting effects on domestic start-ups coexist as a result of the inflow of FDI. One is the positive demand creating effect through linkage and spillover, whereas the other is the competition effect that impedes the inflow of potential entrants. Vietnam's local firms largely lag far behind MNCs in terms of production technology and management skills, suggesting that the negative competition effect is stronger, thereby offsetting the positive demand creation effect. Alternatively, when local firms have sufficient technological capability such as in Belgium, the competition effect of FDI would be lower and would be probably dominated by the positive linkage effect. If Vietnamese firms can promote their productivity and upgrade their technological capabilities, then horizontal FDI will turn out to have a positive influence on domestic entrepreneurs on aggregate, as more incumbents and entrants will be able to compete with foreign affiliates.

Columns (5) and (6) show the results by including both forward and backward linkages together with HFDI. We find that backward linkages are significant while forward linkages are insignificant.

TABLE 5 Horizontal FDI, vertical FDI, and domestic entrants in Vietnam

	(1)	(2)	(3)	(4)	(5)	(6)
	Poisson-PML	NB	Poisson-PML	NB	Poisson-PML	NB
	FE	FE	FE	FE	FE	FE
ln*MES*	−0.237**	−0.229***	−0.210**	−0.193***	−0.232**	−0.206***
	(0.095)	(0.056)	(0.099)	(0.059)	(0.094)	(0.060)
ln*KL*	−0.067	−0.013	−0.050	0.008	−0.057	−0.009
	(0.147)	(0.056)	(0.141)	(0.058)	(0.140)	(0.058)
PCM	0.127	0.137	0.144	0.187*	0.126	0.157
	(0.179)	(0.107)	(0.172)	(0.101)	(0.179)	(0.107)
ln*SCALE*	0.172***	0.120***	0.172***	0.112**	0.174***	0.117**
	(0.054)	(0.024)	(0.054)	(0.024)	(0.054)	(0.025)
GR	1.9e-04***	1.3e-04***	1.9e-04***	1.3e-04***	1.9e-04***	1.3e-04***
	(4.7e-05)	(2.2e-05)	(4.7e-05)	(2.2e-05)	(4.7e-05)	(2.3e-05)
DEXIT	0.0016***	0.002***	0.0016***	0.002***	0.0016***	0.002***
	(0.0006)	(0.0004)	(0.0006)	(0.0004)	(0.0006)	(0.0004)
FENTRY	0.008**	0.010***	0.007*	0.010***	0.008**	0.010***
	(0.004)	(0.002)	(0.004)	(0.002)	(0.004)	(0.002)
ln*EXPORT*	0.191***	0.086***	0.188***	0.086***	0.193***	0.088***
	(0.056)	(0.024)	(0.056)	(0.024)	(0.057)	(0.024)
IMPORTR	−6.4e-05*	−0.0001	−7.7e-05*	−1.5e-04	−7.1e-05*	−1.5e-04
	(3.6e-05)	(0.0001)	(4.0e-05)	(0.0001)	(3.7e-05)	(0.0001)
HFDI_sale	−0.043	−0.162			−0.984	
	(0.117)	(0.110)			(1.049)	
HFDI_firm			−0.496	−0.767**		−0.548
			(0.473)	(0.367)		(0.411)
VFDI_forward					−0.312	−0.306
					(0.296)	(0.345)
VFDI_backward					1.130**	0.636*
					(0.566)	(0.340)
Constant		0.474		0.378		0.359
		(0.468)		(0.474)		(0.475)
Year dummy	Yes	Yes	Yes	Yes	Yes	Yes
Log pseudo likelihood	−2,446		−2,446		−2,438	
Log likelihood		−1,625		−1,627		−1,624
No. of observations	606	606	606	606	606	606

Note: Figures in parentheses are standard errors. ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

The Czech Republic experience examined by Ayyagari and Kosová (2010) show that both horizontal and vertical spillover effects of FDI on facilitating entry are not found in the manufacturing sector, whereas Anwar and Sun (2012) found that the backward linkage of FDI was positively related to the net entry in China. Our finding is similar to that of China and it is because MNCs in both countries mainly focus on assembly exports. The magnitude of the coefficient of *VFDI_backward* (0.636) in column (6) means that a 1% increase in the share of foreign presence in downstream sectors leads to a 0.636% increase of new start-ups in terms of firm numbers.

International production fragmentation is a prevailing production pattern in Asia. Cross-border production chains tend to include geographically proximate countries accompanied by trade integration (Johnson & Noguera, 2012). Vietnam has become an emerging FDI destination for its Asian neighbors to conduct assembly exports, especially focusing on textile, footwear, and other labor-intensive industries. As foreign firms in these industries require limited intermediate goods to be imported from parent countries, they may need raw materials from local suppliers, resulting in a strong backward linkage effect. In contrast, foreign firms generally export their products to international markets rather than marketing them as intermediate goods to local buyers, leading to an insignificant forward linkage effect.

6 | CONCLUDING REMARKS

Under the circumstances of globalization, developing countries, including Vietnam, generally attract large amounts of FDI inflow that aims to serve the local market and/or undertake exportation to other countries. Accordingly, the concern about the facilitation or deterrent effect of foreign firms on domestic entrepreneurship attracts growing concerns. This paper examines how foreign presence is related to the entry of domestic firms in the Vietnam manufacturing industry by focusing on various entrepreneurship effects: the short-run and long-run effects brought about by FDI, horizontal FDI, and vertical FDI, as well as backward and forward linkages of FDI.

Based on the discrete entry game model, we employ the count data model to estimate the determinants of the number of entrants in Vietnam's four-digit manufacturing industries over the 2001 to 2005 period. In contrast to findings in previous studies for developed economies, the inflow of foreign firms has a positive relationship with domestic start-ups in the short run. However, we find no significant influence of foreign presence on domestic entrepreneurship in the long run within the same industry and it is probably caused by two contrasting effects: a direct negative competition effect and an indirect positive effect owing to learning, demonstration, networking, and linkage. Regarding the inter-industry spillover effect, the backward linkage of vertical FDI brings about new business opportunities, thus encouraging domestic entry, whereas there is no significant demand creation effect brought about by the forward linkage effect.

As expected, exporting has a positive influence on entry flow. The size of the international market is relatively huge for firms of open economies and attracts them to export, if they can survive under an environment characterized by tough competition. In contrast, import competition has a slightly negative (or significant) association with the flow of domestic entrants. It is probably attributed to the tradeoff between two opposing influences brought about by imported production inputs and competing final goods.

Regarding conventional industry characteristics on deterring or fostering entrants, the estimates are overall consistent with findings in the literature. An *MES* is the main barrier to industry entry, whereas higher profits, larger market size, and higher sales growth in an industry are major incentives for potential entrepreneurs to start-up a business. Moreover, the vacancies from exiting inefficient firms will attract potential entrants to enter a market.

The findings in this study have important policy implications for this transition economy. First, to obtain a crowding-in effect of FDI in the long run, as found in De Backer and Sleuwaegen (2003) for the case of Belgium, Vietnamese firms should promote their technological and absorptive capabilities. It will not only help them to compete with foreign firms, but will also enhance the positive demand creation effect of FDI through vertical linkages. Secondly, although imports are overall less relevant (or slightly negative) to domestic entrants, imports of cheaper intermediate goods are found to raise firm productivity in Indonesia (Amiti & Konings, 2007) or facilitate more local firms to export in China (Yu, 2015). Therefore, lowering tariffs of imported intermediate inputs may facilitate domestic entrants through learning and exporting effects.

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ENDNOTES

[1] Berry (1992) and Toivanen and Waterson (2000) also develop a discrete game theoretical model of entry.

[2] Traditional theoretical entry models focus on incumbents' strategic behaviors, mainly pricing, R&D, and advertisement, among others. Please see Ericson and Pakes (1995), Geroski (1995), and Pakes and Ericson (1998).

[3] There is another strand of literature that examines how foreign presence (a foreign presence dummy and/or foreign market share in an industry) affects the probability of firm exit using firm-level dataset, such as Franco and Weche Gelübcke (2015) for Germany, Kosová (2010) for the Czech Republic, and Kejzar (2011) for Slovenia. Their results overall imply a crowd-out effect.

[4] The FDI information is available from the website of GSO, Vietnam: http://www.gso.gov.vn

[5] Even though we use a wider classification of VSIC three-digit industries, some industries experience a very few or even zero number of entrants. Please see Appendix Table A1.

[6] If possible, it is better to consider firm-specific characteristics. However, the empirical estimation aggregates firm-level data into industry-level data. Adopting the aggregations of firms' characteristics is thus one possible solution (Mata, 1993).

[7] See Berry (1992) for a proof.

[8] In general, foreign entry is large scale entry, while entry by domestic firms appears to be of very small scale in developing countries. This raises the question that the competitive adjustment assumed in the model mainly affects the scale of entry, rather than the rate of entry, an effect identified in Görg and Strobl (2002). If firm-level data is available, then quantile regression is probably a more adequate approach.

[9] As there is a high correlation between import and export value (>0.9); import enters the equation in the ratio form rather than value form, in order to mitigate the multicollinearity problem.

[10] It is ideal to exclude imports of intermediate inputs into the industry while our data cannot differentiate intermediate goods from total imports. It implies that imports might have a positive relation with the number of firms within an industry, whereas assembly exports account for a large share of its output.

[11] The average size has also been used in terms of the number of employees of each firm, as the proxy of MES to conduct estimations, as used in Arauzo-Carod and Segarra-Blasco (2005) and Görg and Strobl (2002). Results show that MES is negatively and significantly related to domestic entrants, similar to findings of the other studies.

[12] See http://www.gso.gov.vn/default_en.aspx?tabxml:id=780

[13] The distinction of different types of imports can refer to the Broad Economic Category (BEC) classification, but this distinction requires subjective judgments on some products (two-digit HS code). Distinguishing imported production inputs from competing consumer goods to examine their respective influence on entry is a notable research issue. At this moment, this study focuses on the short-run and long-run effects of FDI on entrepreneurship, as well as the effects of various types of FDI.

[14] The results are the same when we exclude the short-run effect of *FENTRY* or use the three-digit industry dataset to conduct empirical estimations.

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APPENDIX

TABLE A1 Distribution for the number of entrants in three-digit industries

	2001		2002		2003		2004		2005	
Count	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**	**Domestic**	**Foreign**
<10	20	37	21	48	18	45	17	42	16	42
	(32.29%)	(59.68%)	(33.87%)	(77.42%)	(29.03%)	(72.58%)	(27.42%)	(62.74%)	(25.81%)	(62.74%)
$10 \leq N < 50$	17	24	21	13	21	16	17	19	17	18
	(27.42%)	(38.71%)	(33.87%)	(20.97%)	(33.87%)	(25.81%)	(27.42%)	(30.65%)	(27.42%)	(29.03%)
$50 \leq N < 100$	8	1	5	1	5	1	9	1	10	2
	(12.90%)	(1.61%)	(8.06%)	(1.61%)	(8.06%)	(1.61%)	(14.52%)	(1.61%)	(16.13%)	(3.23%)
$100 \leq N < 500$	17	0	15	0	18	0	17	0	16	0
	(27.42%)		(24.19%)		(29.03%)		(27.42%)		(25.81%)	
≥500	0	0	0	0	0	0	2	0	3	0
							(3.23%)		(4.84%)	
Observations	62	62	62	62	62	62	62	62	62	62
Maximum	461	90	271	57	390	89	586	62	744	58
Mean	/92.6	11.5	60.6	5.5	85.3	8.4	107.5	8.6	122.9	10.0
Minimum	0	0	0	0	0	0	0	0	1	0
SE	126.9	15.9	80.0	8.7	111.1	13.5	148.6	11.4	172.9	13.7

Note: SE = standard error. Figures in parentheses are percentages.

Source. Author's calculations.