FIRM EXPORT AND THE IMPACT OF FOREIGN OWNERSHIP IN VIETNAM: A MICRO-DATA ANALYSIS[*]

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This paper investigates the impact of foreign ownership on firm exports in Vietnam and analyzes how export participation and export intensity vary with ownership status by comparing Foreign Direct Investment enterprises (FDI enterprises) versus domestic firms, and wholly-foreign-owned enterprises (WFs) versus foreign joint ventures (JVs). Using data from 2010-2015 Vietnamese enterprise survey (VES), we document that after controlling for firm characteristics, industry and region, FDI enterprises have higher export participation and higher export intensity than local firms. The finding supports the hypothesis that FDI enterprises inherit from foreign firm competitive advantages and therefore become superior in exports. We also find that while export participation is similar between JVs and WFs, export intensity is significantly higher for WFs than for JVs. This suggests that export-oriented foreign investors tend to establish 100% foreign-owned companies to exploit advantages of labor costs or natural resources, while domestic-oriented firms tend to form joint venture to penetrate the domestic market.

Keywords: Export Participation, Export Intensity, Foreign Ownership, Vietnam
JEL Classification: F14, F23, L24, L25

1. INTRODUCTION

The relationship between foreign ownership and firm export propensity has long drawn attention in the literature to help promote firm exports in developing countries. Theories of international investment substantially suggest that Foreign Direct Investment enterprises (FDI enterprises) possess specific advantages such as

cutting-edge technology, managerial know-how, and superior international marketing. The possession of these assets in relatively large amounts can facilitate lower production costs and/or export related transactions costs, making FDI enterprises better able to export than their domestic counterparts (Buckley and Casson, 1992; Casson, 1987; Dunning, 1979). Nevertheless, critics point out some cases that may lead to the erosion of advantage possessed by multinational enterprises. Firstly, the monopolistic advantages of multinational enterprises over local firms lie mostly in product areas where technology is least standardized, scale economies are present, and marketing entry barriers are high. Thus, at the initial stage of export expansion, the typical developing country has market niches mostly in light-manufactured goods produced with standardized and diffused technology. In such product areas a foreign firm is unlikely to have the technological capacity to outperform the local firms. Also, indigenous firms in these areas may be able to achieve comparable performance utilizing marketing services provided by foreign buyers (Hone, 1984; Keesing, 1983; Helleiner, 1988). Secondly, policy factors in a host country may exert a strong discriminatory influence on export potential of foreign firms, for example, difficult labour conditions, administrative delays and restrictions on profit remissions (Lall and Mohammad, 1983). Taken together, the inconsistency in theoretical studies turns the topic into an empirical issue which depends on the endowments of each host country.

In terms of empirical studies, it has been widely found that foreign-owned enterprises have significantly higher export propensity than domestic firms in many countries including an inward-looking economy like India (Lall and Kumar, 1981), communist countries under economic transformation like Estonian and Slovenian (Rojec et al., 2004) and other countries such as Thailand (Jongwanich and Kohpaiboon, 2008) and Japan (Okubo et al., 2017). However, Rojec et al. (2004) also indicate that there is no evidence that multinational enterprises (MNEs) with large foreign ownership shares have significantly different exports propensity from MNEs with lower foreign ownership shares. Athukorala et al. (1995) investigate the case of Sri Lanka and find that export propensity tends to be similar in developed-country multinational enterprises and domestic enterprises, while it is much higher in third-world multinational enterprises. Furthermore, the result suggests that foreign ownership is positively associated with export participation, but not to export intensity. This is consistent with the fact that Sri Lanka is an LDC country with a small domestic market.

In Vietnam, FDI enterprises have played an increasingly important role in exports. The export-to-GDP ratio was about 6 times larger in FDI enterprises than domestic firms during period 2000-2010 and rose sharply to over 11 times by 2017 (GSO, 2018). There have been several papers investigating the impact of foreign ownership in Vietnam's economic activities (Vo, 2015, 2019a; Batten and Vo, 2015, 2009; Nguyen et al., 2018; Bui et. al, 2018). However, studies of the relationship between foreign ownership and firm export propensity have been not fully understood because of the limitations on data and approaches. Pham (2001) and Phan and Ramstetter (2009) both employ unpublished data on foreign investment projects from the Ministry of Planning and Investment

(MPI). While Pham (2001)'s linear regression model omits standard control variables such as factor intensity, scale as well as vintage of the projects, Phan and Ramstetter (2009) use a standard Tobit model and take such effects into account. However, only foreign corporates are analysed and there are neither plant-level or firm-level data used in both papers. The study of Nguyen and Shoji (2009) is one of the first attempts in Vietnam to examine separately export participation and export intensity regarding a sample for both domestic firms and FDI enterprises. This research uses cross data from World Bank Enterprise Survey in 2005 to investigate the impact of firm-specific characteristics and business environment on firms' export behaviour. Small sample size (1150 observations) and the lack of comparison among enterprises with various foreign ownership shares are limitations of this study. Overcoming such drawbacks, Nguyen and Ramstetter (2018) use data derived from Vietnamese Enterprise Survey, which is conducted annually by General Statistics Office (GSO) to examine the variety in export propensities among four enterprise groups in manufacturing sector: wholly foreign-owned enterprises (WFs), foreign joint ventures (JVs), state-owned enterprises (SOEs) and private firms. The most advantage of this study compared to previous ones is that they had accessed the most official and comprehensive data about production and business of enterprises in Vietnam so far. Applying pooled Tobit model including dummies of firm types for data during the period 2010-2013, Nguyen and Ramstetter (2018) conclude that when the effects of firm size, capital intensity, liquidity, location and industry affiliation are controlled, WFs have the highest conditional probability of exporting large proportions of their turnover, followed by JVs, whereas export propensity is likely to be lower and similar in SOEs and private firms in most industries. Despite interesting implications of this preliminary research, there is an assumption underlying this approach is that the decision to export or not to export are made simultaneously with the decision of how much to export, thus separate analysis of export intensity is not examined in addition to export propensity. Ignoring assumptions and robustness may, consequently, cause biased results or misleading interpretations.

Trade and FDI have been an important driver of economic development for a nation (Batten and Vo, 2009; Nguyen and Vo, 2017; Vo, 2018c). In the world of increased integration (Vo, 2009; Vo and Daly, 2005), these are more important for emerging and developing markets to improve the economy. Vietnam is a small and open economy and various studies concern foreign investors in this market (Batten and Vo, 2015; Vo, 2016a, 2016b, 2018a, 2018b). However, there is no study examining foreign ownership and firm export in Vietnam.

Therefore, it is worthwhile to carry out more in-depth empirical researches on the impact of foreign ownership on firm exports in Vietnam. The contribution of our study is twofold. Firstly, the analysis focus on identifying the impact of foreign ownership on firms' export propensity in Vietnam, in particular, the difference between FDI enterprises and domestic firms, between wholly foreign-owned enterprises (WFs) and foreign joint ventures (JVs) in export participation (the decision of whether to export or not) and export intensity (the decision of how much total sales set for exports).

Secondly, Tobit models and Two-part models are used to analyse the research question under alternative assumptions about the decision of participation and the decision of amount, thereby making comparison to robust conclusions. We employ manufacturing firm-level panel data extracted from the 2010-2015 Vietnamese enterprise survey (VES).

The remainder of the paper is structured as follows. The next section, Section 2 reviews briefly the theoretical background for examining the relationship between foreign ownership and export propensity. Section 3 describes the model, methodology as well as relevant data used for quantitative assessment in the case of Vietnam. Then, the empirical results are discussed in Section 4. Finally, Section 5 concludes with a summary of findings and policy implications.

2.   LITERATURE REVIEW AND THEORETICAL BACKGROUND

The relationship between foreign ownership and export propensity is reflected through the difference in export propensity between foreign-invested firms and domestic firms, and among firms with different foreign ownership shares. This discrepancy stems from the goals and performance of foreign investors, which directly affect production and business operations of foreign-owned subsidiaries. Theory of Strategic orientation proposed by Cui and Lui (2002) based on Eclectic paradigm Dunning (1979) can provide some insights about this mechanism.

Eclectic paradigm is one of dominant theories of international investment that explain the firms' incentives to invest overseas. According to this theory, firms seek three types of advantage when invest abroad, including (O) Ownership advantages or advantages accruing from exploitation of firm-specific tangible or intangible assets such as patent and marketing network; (L) Location advantages or advantages accruing from operating in a specific location with its own benefits (e.g. environment - system - policy) which enable firms to make the best use of their ownership advantages; and (I) Internalization advantages or advantages accruing from the internalization of economic transaction within a single firm unit. These advantages presumably help firms to bear the costs of cross-border operations and determine optimal mode of entry.

To give a full explanation for various types of FDI chosen by investors as well as their operational characteristics, Cui and Lui (2002) highlight that types of investment and operation in different countries would vary depending on firms' strategies when deciding to invest. According to this theory, there are two broad strategic orientations that are inclusive of many advantages and incentives in the host country sought by foreign investors: Local market orientation and Export orientation.

Local market-oriented investors invest who may face saturated market and fierce competition in their home countries decide to invest in another country to acquire untapped market opportunities due to market growth and increasing demands there (Lan, 1996; Luo and Tan, 1997).

Export-oriented investors who may confront highly rising cost in their main markets decide to invest in a new country to exploit various resources such as inexpensive labours, raw materials and preferential investment policies, thereby establishing efficient manufacturing bases which serve for exporting goal (Kumar, 1994; Luo and Park, 2001; Sun, 1999).

Additionally, theory of Strategic orientation implies that in terms of a host country, firms' objectives or foreign investors' strategic orientations toward this country generally depend on the level of economic development and economic structures (Anand and Delois, 1996; Brouthers et al., 1996). Thus, given the background of a developing country which has abundant low-cost labour supply, the number of export orientated investor would be higher than the number of local market orientated investor. Not only benefit from location advantages in host country, FDI enterprises tend to possess relatively sophisticated international marketing network, which allow them to reduce transaction costs regarding to international. Also, ownership advantages and other internalization advantages such as large amount of technology-related intangible assets (for example, R&D results and patents) and managerial know-how would make FDI enterprises more productive and successfully compete with local firms in exports (Buckley and Casson, 1992; Casson, 1987). In this case, FDI enterprises generally have higher export propensity than local firms.

Therefore, on the basis of above theoretical models, we hypothesize as follows:

Hypothesis 1: In a developing country, FDI enterprises have higher export propensity than local firms.

Furthermore, export orientated investors tend to insist on high foreign ownership shares for some reasons. Firstly, the priority of export-oriented business is to explore economical resources and comparative advantages in the host country for their export processing facilities, therefore, the need for control to establish efficient manufacturing platform is relatively pressing (Kumar, 1994). Secondly, there is a large risk that poor coordination between minority-owned affiliates and the parent and/or other affiliates, could result in excess supply of a firm's products in specific markets (Ramstetter and Takii, 2006). Therefore, export-oriented investors are motivated to adopt a choice of entry mode that allows greater control and efficiency, i.e. wholly owned subsidiaries (WFs) and integrated them well into the parent's international network. For minority-owned affiliates (JVs) with lower level of control, multinational enterprises (MNEs) may restrict their affiliates to access firm-specific asset and sometimes force local partner to sign agreements forbidding them from exporting the MNE's products to avoid oversupply.

In contrast, local market-oriented investors are more likely to seek a local partner that may have local marketing expertise and critical relationships in order to develop new customers for their products in the host country. Thus, they tend to form joint ventures (JVs) rather than wholly owned subsidiaries (WFs) (Erramilli, 1990).

Summing up, WFs are more likely to be established by export-oriented investors while JVs tend to be formed by local market-oriented or to be restricted from exporting by parent companies. We formulate the second hypothesis for this study:

Hypothesis 2: Wholly foreign-owned enterprises (WFs) have higher export propensity than foreign joint ventures (JVs).

3.   METHODOLOGY AND MODEL SPECIFICATION

3.1.   Econometrics Methodology

With regards to firms' export behaviour, previous studies have mentioned two major decisions: (1) the decision of whether to export or not (Export participation), and (2) the decision of how much total sales set for export (Export intensity). To investigate the impact of foreign ownership on these two decisions, the following analytical framework is proposed in this study:
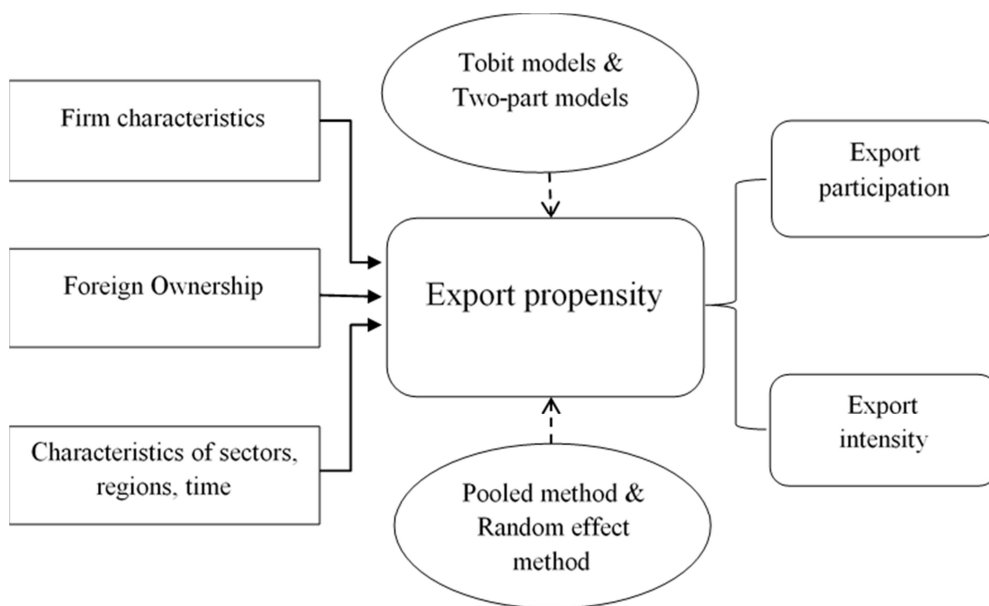

Figure 1.   Analytical Framework

In Figure 1, a range of firm characteristics such as firm size, years of operation, characteristics of capital and labour, etc. are used to capture firm heterogeneity as determinants of export behaviour. Standard Tobit models and Two-part models are

applied to test alternative hypotheses about the relationship between two decisions. Furthermore, pooled method and random-effects method are considered to deal with panel data.

When determining firms' export propensity, the dependent variable (the ratio of export sales to total firm sales) has many observations that take a value of 0, stemming from the fact that the percentage of firms who do not export is very large. This case is known as the Corner Solution, which represents unusual case of individual optimal choices (Wooldridge, 2010). If linear regression is used in this case, estimates will be biased and inconsistent because conditional expected value of error term is different from 0 and error term is correlated to explanatory variables. Commonly, standard Tobit model is applied in many previous studies of export propensity (Nguyen and Ramstetter, 2018; Phan and Ramstetter, 2009; Ramstetter and Takii, 2006) to deal with Corner Solution as follows:

$$y^* = \beta_0 + x\beta + u | x \sim N(0, \sigma^2)$$
$$y = \max(0, y^*),$$

where y is observed export intensity, measured as the ratio of export sales to total sales; x is the vector of independent variables; y^* is latent export intensity, satisfies assumptions in linear regression model. In addition, $y = y^*$ if $y^* \geq 0$, and, $y = 0$ if $y^* \leq 0$.

However, standard Tobit model binds that the participation decision and the amount decision governed by a single mechanism, so the partial effect of each explanatory variable on these two decisions have the same signs and at a constant rate. To overcome drawbacks of standard Tobit model, some *two-part models* are proposed. These models generalize Tobit model with alternative assumptions. Generally, dependent variable y is written as:

$$y = wy^*,$$

where w is a binary variable determining $y = 0$ or $y > 0$ and y^* is a continuous random variable.

In order to check the robustness of estimates from Tobit model as well as loosen assumptions, this study adopts three different two-part models, including *TNH - truncated normal Hurdle model, LH - lognormal Hurdle model* and *ET2T - exponential type II Tobit model*. A general assumption for all of them is that two decisions of exports are made simultaneously when a firm maximizes utility. That is to say, w and y^* are jointly normal distributed.

TNH - truncated normal Hurdle model is developed by Cragg (1971). This model assumes that w and y^* are independent conditional on explanatory variables x. It means that unobservable factors which affect the decision to export or not and unobservable factors which affect the decision of how much to export are uncorrelated.

Then, export participation can be illustrated by a selection function as follows:

$$w^* = x\gamma + v, \ v|x \sim N(0,1),$$

$$w = \begin{cases} 1 \ if \ w^* \geq 0 \\ 0 \ if \ w^* < 0. \end{cases}$$

Latent variable y^* in this model is assumed to have a truncated normal distribution: $y^* = x\beta + u$, where $u|x$ has a truncated normal distribution with lower truncation point $-x\beta$ and $\mathrm{corr}(u, v) = 0$.

In this model, estimation of parameters is implemented with two steps. Firstly, Probit model related to export participation is adopted and γ is estimated. Then, β is to be estimated based on truncated regression model with a sample of firms who export (observed export intensity $y > 0$). It can be seen that TNH model is an extended version of Tobit model when $\gamma = \beta/\sigma$.

LH - lognormal Hurdle model is also proposed by Cragg (1971). The only different assumption of this model compared with TNH model is that latent variable y^* is assumed to have a lognormal distribution: $y^* = \exp(x\beta + u)$, where $u|x \sim N \ (0, \sigma^2)$ and $\mathrm{corr}(u, v) = 0$.

ET2T - exponential type II Tobit is developed from LH model by Wooldridge (2010). Unlike two models above, this model allows unobservable factors which affect the decision to export or not and unobservable factors which affect the decision of how much to export are correlated. That means $\mathrm{corr}(u. v) = \rho \neq 0$ and $\mathrm{cov}(u, v) = \rho\sigma$, where $\sigma^2 = \mathrm{var}(u)$.

Estimation of parameters in this model could be implemented using Maximum Likelihood method or two-stage procedure. If ρ significantly different from 0, ET2T model could be appropriate.

There are three approaches to panel data when it comes to Standard Tobit model and its extensions: Pooled method, Fixed-effect method and Random-effect method. However, applying fixed-effect method to nonlinear model seems complicated and entails econometric problems that have not been solved yet. StataCorp (2013) points out that there does not exist a sufficient statistic allowing fixed effects to be conditioned out of the likelihood and estimates for unconditional fixed effects are biased. In addition, given some features in model specification and data which are described below in Section 3.2, there are some reasons why random effects model (REM) is more suitable to our study compared with fixed effects model (FEM). First, since the interest variable - type of enterprise - is almost unchanged over time, REM proves to be advantageous when it can include independent variables that is time-invariant. Second, Taylor (1980) confirms that if N is large and T is small and assumptions in REM are satisfied then REM estimates are more efficient than FEM estimates. While short panel data (N = 3797, T = 6) is used in this study, REM is more likely to be favorable. Thus, this paper makes analysis based on pooled Tobit model and random effect Tobit model as well as three pooled two-part models.

3.2. Model Specification and Data Source

Given the previous inferences, we construct the confidence intervals for the dynamic Based on the analytical framework (Figure 1), the following general equation is estimated:

$$Ex_{it} = \beta_0 + \beta_1 \log Firmsize_{it} + \beta_2 \log K\_intensity_{it} + \beta_3 \log L\_quality_{it}$$
$$+ \beta_4 EA\_ratio_{it} + \beta_5 dFO_{it} + \beta_6 dWF_{it} + \beta_7 dizone_{it}$$
$$+ \beta_8 dRegion_{it} + \beta_9 dIndustry_{it} + \varepsilon_{it},$$

where X_{it} is an observation for variable X of firm i in the year t.

Export propensity (Ex) is reflected through:

(1) Export participation (a binary variable Ex_par, which equals 1 if the firm exports and equals 0 otherwise) is dependent variable in the equation of participation.

(2) Export intensity (a continuous variable Ex_int, which equals the ratio of export sales to total sales, is defined as percent) is dependent variable in the equation of amount.

The interest variable of is foreign ownership, captured by employing two dummy variables for firm type: dFO equals 1 if the firm is a FDI enterprise (either a wholly foreign-owned enterprise or a foreign joint venture) and equals 0 if the firm is local firm; dWF equals 1 if the firm is a wholly foreign-owned enterprise and equals 0 otherwise. For the purpose of testing two hypotheses suggested in Section 2, coefficients of these two dummies are hypothesized to be positive.

A range of firm-specific variables which captures firm heterogeneity comprises:

Firmsize: The size of enterprise is measured by the number of employees in the year (Lall and Kumar, 1981; Athukorala et al., 1995). This variable is widely used in empirical studies of export performance as an indicator for economies of scale and competitiveness. This variable is expected to have positive impact on export propensity.

K_intensity: Capital intensity is measured by fixed assets per employee in the year (Globerman, 1979). This variable is included to account for difference in technology use among firms. This variable is expected to have positive impact on export propensity.

L_quality: The quality of labour is measured by the average of labour cost in the year (Sinani and Meyer, 2004). Previous empirical studies in Vietnam show that skilled and qualified employees are more likely to receive higher wage compared with low-skilled labours. This variable is expected to have positive impact on export propensity.

EA_ratio: Equity-asset ratio reflects financial constraints (Nguyen and Ramstetter, 2018). Coefficient of this variable is expected to be positive since a firm with higher equity-asset is more likely to loosen financial constraints which make it easier for the firm to cover export cost and have higher export propensity.

dizone: Dummy variable for location of production takes on the value 1 if the firm is located in industrial zone and takes on the value 0 otherwise. This variable is expected to have positive impact on export propensity as one of major policy targets when establishing industrial zones is to boost exports.

Dummy variables for three main regions (Red River Delta and Northern mountainous area, North Central and Southern Central Coast, South East and the Mekong River Delta) are included into the model to control the influence of geographical difference on export propensity. Dummy variables $(dIndustry1 - dIndustry15)$ for fifteen 2-digit industries belonging to manufacturing sector are included into the model to capture industry heterogeneity as determinants of export propensity.

Details of definition and measurement of these dummy variables are summarized in Table 1.

Table 1. Definition and Measurement of Variables

Variables	Definition and Measurements
Dummy variables for regions	
dRegion1	1 if in the Red River Delta and Northern mountainous areas, 0 otherwise
dRegion2	1 if in North Central and Southern Central Coast, 0 otherwise
dRegion3	1 if in South East and the Mekong River Delta, 0 otherwise
Dummy variables for industries	
dIndustry1	1 if belongs to Food products sector (VSIC07 =10), 0 otherwise
dIndustry2	1 if belongs to Textile sector (VSIC07 =13), 0 otherwise
dIndustry3	1 if belongs to Apparel sector (VSIC07 =14), 0 otherwise
dIndustry4	1 if belongs to Leather & footwear sector (VSIC07 =15), 0 otherwise
dIndustry5	1 if belongs to Wood products sector (VSIC07 =16), 0 otherwise
dIndustry6	1 if belongs to Paper products sector (VSIC07 =17), 0 otherwise
dIndustry7	1 if belongs to Rubber & plastics sector (VSIC07 =22), 0 otherwise
dIndustry8	1 if belongs to Basic metals sector (VSIC07 =24), 0 otherwise
dIndustry9	1 if belongs to Metal products sector (VSIC07 =25), 0 otherwise
dIndustry10	1 if belongs to Computer, electronic machinery (VSIC07 =26), 0 otherwise
dIndustry11	1 if belongs to Electric machinery sector (VSIC07 =27),0 otherwise
dIndustry12	1 if belongs to Non-electric machinery sector (VSIC07 =28),0 otherwise
dIndustry13	1 if belongs to Motor vehicles sector (VSIC07 =29),0 otherwise
dIndustry14	1 if belongs to Other transportation machinery sector (VSIC07 =30), 0 otherwise
dIndustry15	1 if belongs to Furniture sector (VSIC07 = 31), 0 otherwise

This paper draws on data from Vietnamese Enterprise Survey (VES) implemented by General Statistics Office (GSO) from 2010 to 2015. Since the first survey was conducted in 2000, details about firms' export activities were not available until 2010. Our study focuses on manufacturing firms (group C) according to the Vietnamese standard industrial classification 2007 (VSIC 2007). Additionally, enterprises which have no more than 10 employees are excluded because they are micro-enterprises with very different characteristics and are more likely to report unrealistic information. After cleaning data, excluding firms involving missing values and combining datasets, we draw a balanced panel data including 22782 observations corresponding to 3797 enterprises during the period 2010-2015. In order to control for effects of inflation,

currency variables are converted to the base price in 2010. The software Stata 14.0 is used for data manipulation and econometric analysis.

4.   EMPIRICAL RESULTS AND DISCUSSTIONS

4.1.   Descriptive Statistics

Table 2.   Descriptive Statistics of Key Variables by Year (2010-2015)

Year	2010	2011	2012	2013	2014	2015	Overall period
Ex_int							
Mean	19.31	20.51	20.65	21.32	21.55	21.14	20.75
Sd	33.20	34.12	34.04	34.22	34.34	33.79	33.96
Min	0	0	0	0	0	0	0
Max	100	100	100	100	100	100	100
Ex_par							
Mean	0.25	0.28	0.30	0.30	0.29	0.30	0.29
Sd	0.43	0.45	0.46	0.46	0.46	0.46	0.45
Min	0	0	0	0	0	0	0
Max	1	1	1	1	1	1	1
Firmsize							
Mean	239	255	274	278	284	294	271
Sd	802	923	1079	1104	1204	1286	1079
Min	11	11	11	11	11	11	11
Max	21449	24889	25471	28140	38849	43356	43356
K_intensity							
Mean	195.61	195.50	200.01	209.56	225.54	240.78	211.17
Sd	376.59	370.96	368.36	362.59	754.67	405.42	462.22
Min	0.09	0.05	0.10	0.09	0.23	0.14	0.05
Max	6949.49	7852.12	7463.62	6787.73	40657.80	7112.62	40657.80
L_quality							
Mean	36.79	37.41	38.90	40.17	42.45	46.84	40.42
Sd	28.16	46.99	35.43	28.68	29.21	30.05	33.92
Min	0.70	1.27	0.19	1.06	0.22	0.90	0.19
Max	375.24	1894.79	1323.32	435.69	588.93	506.82	1894.79
EA_ratio							
Mean	0.50	0.48	0.46	0.46	0.45	0.43	0.46
Sd	0.26	0.26	0.26	0.26	0.26	0.24	0.26
Min	0	0	0	0	0	0	0
Max	1.08	1.06	1.58	1.01	1.16	1.27	1.58
Obs	3797	3797	3797	3797	3797	3797	22782

Source: Vietnamese enterprise survey 2010-2015 (GSO).

Descriptive statistics of variables by year are shown in Table 2. Overall, indicators for firms' export propensity experienced upward trends over the period. While the percentage

of firms who participated in export market increased from 25% in 2010 to about 30% in 2015, the average of firms' ratio of export sales against total sales rose slightly from 19.31% in 2010 to a peak of 21.55% in 2014 and then decreased to 21.14% in 2015. The average of the number of workers also went up overtime from 239 people per firm in 2010 to 294 people per firm. Meanwhile, the amount of capital increased at a higher rate, thus leading to the growth of capital intensity with an average rate of about 4% per year. Not only are workers equipped with more capital, on average, they are also received higher wage and this figure rose continuously over the time surveyed. By contrast, the equity-to-asset ratio decreased over 5-year period, from 0.5 to 0.43.

Table 3 describes the mean of variables by firm type during the period 2010-2015. There are 17.768 observations for local firms, and 5.114 observations for FDI enterprises which comprised 4.621 observations for WFs and 493 observations for JVs. Data provide initial evidence that WFs with the highest foreign ownership shares also had the highest export propensity, followed by JVs and domestic firms. In particular, the rate of FDI enterprises who exported (88%) tripled the figure for domestic firms (28%). WFs had a higher proportion in exporting enterprises than JVs, 89% and 86% respectively. Likewise, the average export sales-to-total sales ratio of FDI enterprises was 48.42%, approximately four times the figure for domestic firms (12.72%). The difference in this ratio between WFs and JVs was also obvious, 49.34 % and 36% respectively. With regards to firm-specific characteristics, on average, FDI enterprises had larger size, greater capital intensity, higher labour cost and higher equity-to-asset ratio than local firms. Furthermore, JVs were greater in such characteristics compared to WFs.

Table 3.   Mean of Variables by Firm Type (2010-2015)

Variables	Local firms	FDI firms	JVs	WFs
Ex_int	12.74	48.42	36.00	49.74
Ex_par	0.28	0.88	0.86	0.89
logFirmsize	4.22	5.3	5.34	5.29
logK_intensity	4.29	5.41	5.55	5.39
logL_quality	3.36	3.94	4.04	3.93
EA_ratio	0.44	0.54	0.55	0.53
Observations	17668	5114	493	4621

Source: Vietnamese enterprise survey 2010-2015 (GSO).

4.2.   Estimates of Tobit models

We use pooled Tobit model and random effect Tobit model to assess the impact of foreign ownership on firms' export propensity. As documented in Table 4, random effect Tobit model is more appropriate for data analysis in this study. Most of the coefficients on independent variables are statistically significant and relatively comparable in both Tobit models. This finding confirms the influence of these variables on export propensity as follows.

Firstly, firm's characteristics including the size of firm (*Firmsize*), capital intensity

($K\_intensity$) and the quality of labour ($L\_quality$) have positive impact on export propensity as expected. A possible explanation is that enterprises with larger size, higher capital intensity and greater quality of labour may be more productive and bear lower costs in exports, thus having higher export propensity. In addition, the positive estimated coefficient of *dizone* suggests that firms located in industrial zone tend to have higher export propensity. However, equity-to-asset ratio (EA_ratio) has negative impact on export propensity at the 1 percent level of significant in both models, contrasting to the initial expectation. In other words, debt-to-asset ratio (leverage ratio) has positive and statistically significant impact on export propensity. The study of Nguyen and Ramstetter (2018) using the same data source (Vietnamese enterprise survey) but during shorter period (2010-2013), also find similar phenomenon. It is possible that a financially unconstrained firm consider high leverage as a way to enjoy the advantage of interest tax shield, while financially-distressed firms may have difficulties in accessing external financing (banks, for example) due to their credit constraints. This situation is prevalent in Vietnam, especially to private firms or SMEs. The more obstacles in financing trade activities the firms encounter, the lower probability of exporting.

Table 4. Estimates of Average Partial Effects on Export Propensity in Tobit Models

Variables	Pooled Tobit Model		Random Effect Tobit Model	
	Export participation	Export intensity	Export participation	Export intensity
logFirmsize	0.105***	6.483***	0.096***	6.047***
logK_intensity	0.015***	0.914***	0.027***	1.699***
logL_quality	0.058***	3.565***	0.037***	2.314***
EA_ratio	-0.109***	-6.734***	-0.040***	-2.514***
dFO	0.171***	10.496***	0.228***	14.359***
dWF	0.068***	4.154***	0.019	1.186
Dizone	0.074***	4.438***	0.025***	1.589***
Region	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Sigma	48.351***			
σ_ε^2			45.214***	
σ_u^2			26.825***	
Log likelihood	-55282		-50196	
Observations	22776		22776	
Observations, Ex_int = 0	13308		13308	

Note: **, *** are respectively statistically significant at 5%, 1%.

Considering foreign ownership represented by the dummy dFO (whether firm is foreign-owned or not) and the dummy dWF (whether firm is wholly foreign-owned or not), estimation result based on pooled Tobit model indicates the positive and statistically significant coefficients of both variables. This implies that hold other factors fixed, FDI enterprises have higher export propensity than local firms and WFs have higher export

propensity than JVs. This result supports initial hypotheses in Section 2 and is consistent with previous studies in Vietnam. However, estimation result based on random effect Tobit model shows that the coefficient on the dummy dFO is also positive and statistically significant at 1 percent level, while the coefficient on the dummy dWF was positive but insignificant. In this case, there is no evidence for a significant difference in conditional export propensity between WFs and JVs. This inconsistency in results from pooled Tobit model and random effect Tobit model may be due to unobservable individual heterogeneity which is accounted for in the latter but is not included in the former. In the pooled model, all intercepts as well as slopes are the same among entities (individuals, firms, nations), thus ignoring panel structure of data. Therefore, it is essential for other analysis to be taken into consideration in this study to robust the results.

4.3. Estimates of Two-part Models

We apply three types of pooled two-part models to allow different mechanism for the decision of whether export or not export and the decision of how much of total sales set for export: truncated normal Hurdle (TNH) model, lognormal Hurdle (LH) model and Exponential Typed II Tobit (ET2T) model. Estimates of the average partial effects are shown in Table 5.

Table 5.   Estimates of Average Partial Effects on Export Propensity in Two-part Models

Variables	Pooled TNH Model		Pooled LH Model		Pooled ET2T Model	
	(Ex_par)	(Ex_int)	(Ex_par)	(logEx_int)	(Ex_par)	(logEx_int)
logFirmsize	0.128***	4.302***	0.128***	0.027*	0.128***	-0.002
logK_intensity	0.030***	-7.875***	0.030***	-0.124***	0.030***	-0.133***
logL_quality	0.065***	-3.815***	0.065***	-0.200***	0.065***	-0.221***
EA_ratio	-0.097***	-5.193*	-0.097***	-0.179**	-0.097***	-0.153**
dFO	0.227***	9.332**	0.227***	0.165*	0.227***	0.106
dWF	0.021	27.687***	0.021	0.463***	0.021	0.463***
dizone	0.077***	8.854***	0.077***	0.186***	0.077***	0.167***
Region	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22,776	9,468	22,776	9,468	22,776	9,468
Log likelihood	-53619.93		-57170.739			

Note: Dependent variable in parentheses.

      *, **, *** are respectively statistically significant at 10%, 5%, 1%.

ET2T model is estimated in accordance with two-step Heckit procedure. The result indicates ρ = -0.0183 but has no statistically significant in LR test. Thus, there is no evidence of the correlation between unobservable factors that affect the decision of participation and the ones that affect the decision of amount. At the same time, coefficient estimates of many variables in pooled ET2T model are quite similar to pooled LH model. Therefore, it seems reasonable that two decisions in export are made simultaneously but independently affected by contributing factors as assumed in TNH model and LH model. This finding is in agreement with previous studies of Helpman et al. (2008), Lawless and Whelan (2008) which state that although these two decisions are interdependent, the magnitude of each factor that influences two decisions is heterogeneous. Estimates from pooled TNH model and pooled LH model indicate that the direction of the effect and statistical significance level of variables are almost identical in these two models. Furthermore, based on the log likelihood, the pooled TNH model fits considerably better than the pooled LH model and the difference is highly statistically significant when Vuong (1989)'s test is used. Employing LR statistics, the pooled TNH model is also more appropriate than pooled Tobit model. Remarkable results are discussed below.

With regards to firm characteristics, firm size has positive effect on both export participation and export intensity. Meanwhile, equity-to-asset ratio has negative and statistically significant impact on these export decisions. This result is in line with above Tobit models and previous studies in Vietnam (Hiep and Nishijima, 2009; Nguyen and Sun, 2012; Nguyen and Shoji, 2009). While estimates from Tobit models highlight the positive impacts of capital intensity and the quality of labour on export propensity, estimates from two-part models confirm the positive effects on export participation but the negative effects on export intensity. Holding other factors constant, firms who have higher capital intensity or greater quality of labour are more likely to be successful in accessing export market. The reason might be that such firms acquire better understanding about target markets and provide products that meet requirements, thereby overcoming entry barriers more easily. Nonetheless, among exporting firms, those who is labour intensive (low *K_intensity*) and low in labour costs (low *L_quality*) tended to have higher competitiveness in foreign market and achieve higher export intensity. This finding is in agreement with previous studies for the case of Vietnam (Nguyen and Shoji, 2009; Phan and Ramstetter, 2009) as well as many developing country (Franco and Sasidharan, 2009; Sun, 2009). It can be explained by the fact that exports of manufacturing industry in Vietnam during studied period highly dependent on the advantage of abundant low-cost labour supply. Nguyen and Shoji (2009) argued that most exporting sectors of Vietnam face severe competition from other developing countries, especially those in Asia that have the same export structure. To compete successfully with others in the same tier of the value chain which is often small, low value-added section, those firms in Vietnam must have to set lower export price. Hence, they intensify their exports by using labour intensive technology or make the best use of low labour cost. Also, evidence for the advantage of labour-intensive producers in exports can be seen from our estimation. Those firms which are in sectors like Food and products, Textile,

Apparel, Leather and products and Wood and products have higher export intensity.

When firm heterogeneity, industry heterogeneity and geographical difference are controlled, FDI enterprises have higher export participation as well as higher export intensity compared with local firms. Additionally, WFs are not significantly different from JVs in export participation but significantly superior in the export intensity. Estimates from two-part models confirm the results from pooled Tobit and random effect Tobit regarding the relationship between foreign ownership and export propensity. In particular, dummy variable dFO on the presence of foreign ownership is statistically significant in all 5 models, except for the ET2T model's equation of export intensity. Dummy variable dWF, which distinguish between WFs and JVs is statistically significant at 1 percent level in pooled Tobit model and equations of export intensity at all three two-part models while it is insignificant in random effect Tobit model and Probit equation of export participation. Estimates of TNH models suggest that holding other factors fixed, compared to domestic firms, JVs are 22.7 percent point more likely to export and are 9.3 percent point higher in average export intensity. Comparison between WFs and JVs shows that the difference in export participation is insignificant but WFs are 27.7 percent point higher in export intensity. In general, the majority of FDI enterprises in Vietnam are export-oriented rather than local market-oriented since location advantages of Vietnam is political stability, abundant low-cost labour and rich mineral resources. Therefore, foreign investors decide to invest in Vietnam in order to exploit these resources and establish efficient production bases for export processing (Vo, 2017, 2019b; Vo et. al., 2017). FDI enterprises possess competitive advantages such as experienced international marketing, state-of-the-art technology and advanced managerial know-how thereby being superior in exports (Vo, 2016, 2018b; Buckley and Casson, 1992; Casson, 1987; Dunning, 1979). Critics may argue that these monopolistic advantages of multinational enterprises could be held down by policy discrimination, but it is unlikely the case in Vietnam. Since the Law on Foreign Investment was promulgated in 1988, especially when Vietnam joined the World Trade Organization (WTO), the Laws in this country have provided comprehensive basic legal protection and preferential policies for foreign investors. Thus, the relatively friendly investment legal framework enables both WFs and JVs to bring their export potential to the fullest and outperform purely indigenous firms. On the other hand, the similarly high probability of exporting between WFs and JVs implies that export participation may be a big concern of foreign investors regardless of entry mode. In fact, in the early stage of attracting FDI in Vietnam, export-oriented foreign investors gravitated towards joint venture mode when they enter the country market because of their lack of cultural knowledge and management expertise. Hence, many JVs involve in export activities. However, in the later stages, as foreign ownership restrictions have not been particularly strict in Vietnam, export-oriented foreign investors tend to prefer wholly foreign-owned mode for the sake of greater control. Meanwhile, minority-owned affiliates (JVs) with lower level of control may face limited access to parent multinational companies' technology-related asset, which is an important source of competitiveness, or sometimes be forced to sign agreements forbidding them from exporting to specific

markets to avoid oversupply, as the case in Indonesia (Ramstetter and Takii, 2005) and Thailand (Ramstetter and Umemoto, 2006). That can be a possible explanation for much higher export intensity of WFs compared to JVs in our research.

5. CONCLUSION

There are several studies examine firm behavior in Vietnam, however, these papers focus mainly on firms listed on the stock exchanges (Batten and Vo 2019a,b, Nguyen et al. 2018, Vo, 2017a,b Vo, 2018d, Vo, 2019a, b,c,d, Vo and Chu, 2019). To fill this gap, this paper examines the impact of foreign ownership on firm exports in Vietnam. We establish an empirical model of firm export propensity, in which interest variables are dummy variables in order to test two hypotheses about the superior export propensity of FDI enterprises (foreign-owned enterprises) compared with local firms, and of wholly foreign-owned enterprises (WFs) compared with foreign joint ventures (JVs). Based on econometric theories about Corner Solution, pooled Tobit model and random effect Tobit model, pooled Two-part models are used to analyse the research question under alternative assumptions about the decision of whether to export or not and the decision of how much total sales set for exports. Estimation results show that random effect Tobit model is more appropriate than pooled Tobit to panel data estimations regarding this study. Furthermore, it seems reasonable when assuming that these two export decisions are made simultaneously but are affected independently by contributing factors in pooled THN model and pooled LH model. This finding provides the following insights for future research. Regarding studies on firms' export behaviour, both export participation and export intensity should be considered. Meanwhile, two-part models could be better choices rather than standard Tobit model. A further study could refine our models by estimating fixed-effect two-part models or random-effect two-part models for panel data and adding more regressors to two equations corresponding to two decisions.

Regarding the impact of foreign ownership on exports of manufacturing enterprises in Vietnam, the results reveal that: FDI enterprises (both JVs and WFs) have higher export participation and higher export intensity compared to local firms in the host country. Generally, Vietnam mainly attracts export-oriented foreign investors thanks to its abundant low-cost labour supply; these FDI enterprises possess competitive advantages thereby being superior in exports. While export participation between are similar JVs and WFs, WFs have higher export intensity than JVs. A possible explanation for this might be that JVs with lower level of control may face restrictions on access to parent companies' specific asset or sometimes be forced to sign agreements forbidding them from exporting to avoid excess supply. These conclusions have some important implications for future practice: Firstly, establishing joint ventures should be taken in consideration by domestic businesses to enter the international market and to take advantage of spill-over effects. Secondly, policy makers should help domestic firms and

foreign joint ventures to enhance their export performance, as well as tighten foreign investment regulations to oblige foreign investors to form partnership with domestic enterprises.

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