The Exporting and Productivity Nexus: Does Firm Size Matter?

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Abstract: The main purpose of this study is to examine whether the relationship between exporting and productivity differs across firm sizes in the Malaysian manufacturing sector. A firm-level panel data from the Study on Knowledge Content in Economic Sectors in Malaysia (MyKE) is used in the study. Overall, exporters were found to be more productive than non-exporters. This productivity gap becomes less important as firms become larger. There is evidence that the selection process for exporting is binding only for small firms. Policies that are meant to encourage small firms to export need to focus on enhancing human capital and foreign ownership.

Keywords: Globalisation, Firm Size, Exporting, Productivity

JEL Classification: L60, O30, F14

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1. Introduction

Firm-level heterogeneity has been an important feature of recent theories and empirical work on international trade.[1] This heterogeneity can take many forms such as in terms of characteristics (e.g., employment size, revenues, R&D expenditure, and exporting status) and performance (e.g., profitability, productivity, and innovation). A key area of focus within this research literature is the positive relationship between exporting and productivity (Greenaway and Keller, 2007).

Firm size is an important dimension in the linkage between exporting and productivity for a number of reasons. First, large firms are often considered to have a higher level of productivity than smaller-sized firms. Second, given that exporting is often associated with high-level productivity, this suggests that larger firms have a higher tendency to export their products compared to smaller firms. This finding has significant policy implications given the importance of small and medium-sized enterprises (SMEs) in most economies.

The issue of how firm size might matter in the relationship between exporting and productivity is particularly important for countries that have a large proportion of SMEs and rely heavily on exports as a driver of industrialization and economic growth. Malaysia is one such country. About 98.5 percent of the 78,000 firms in the country are SMEs (SME Annual Report, 2012). These firms contribute towards 59 percent of the country's total employment. Despite this, SMEs' contribution to total manufactured exports is only 30 percent. This state of affairs raises important questions about firm size, exporting, and productivity.

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[1] For surveys of the literature, see Harrison et al. (2011), Redding (2011) and Bernard et al (2012).

To explore these issues, this paper seeks to examine whether the relationship between exporting and productivity differs across firms of different sizes. Findings from the study will contribute to existing body of empirical literature on the linkage between exporting and productivity. As there have been relatively few studies on this topic from developing countries, it is also hoped that this study will strengthen evidence-based policy making in this area.

The outline of the paper is as follows: After the introduction portion, Section 2 provides a review of the relevant literature. Methodological issues are discussed in Section 3. The empirical results are presented and discussed in Section 4. Section 5 presents the conclusions and policy implications.

2. Literature Review

The relationship between exporting and productivity is a key focus of the heterogeneous firm literature in international trade.[2] These studies were primarily motivated by earlier empirical evidence on exporters being more productive than non-exporters (Redding, 2011). Two distinct hypotheses have been articulated in the literature. Both differ in terms of the direction of causality between exporting and productivity.

In the "self-selection hypothesis" (SS Hypothesis), the causality runs from productivity to exporting in which firms with high ex-ante productivity choose to export because of the high sunk cost incurred in exporting. The theoretical support for this hypothesis can be found in the seminal paper by Melitz (2003), in which only the most productive firms export whilst less productive firms either supply only to domestic markets or exit the market. In contrast, the "learning-by-exporting hypothesis" (LE Hypothesis) proposes that firms gain higher ex-post productivity after exporting. This is due to a number of factors such as new knowledge and expertise from buyers (innovation), scale economies, and exposure to competition (reduction of inefficiency). The earlier empirical literature has mostly found evidence in support of the self-selection hypothesis (see surveys by Greenaway and Kneller, 2007; and Wagner, 2007).

[2] The seminal contributions in the literature include Melitz (2003), Bernard et al (2003), and Helpman et al (2004).

However, more recent studies such as De Loecker (2013) and Manjon et al (2013), with improved modelling of the productivity process, have provided some evidence supporting the learning-by-exporting hypothesis.

Whilst the debate on the direction of causality between exporting and productivity continues, there has been an increasing interest in the role of firm size. Firm size has traditionally been assigned as a control variable in the literature. Most studies have found exporters to be larger in size than non-exporters (Wagner, 2007). This raises important questions about the sources of productivity gains related to exporting and more specifically, whether such sources are related to firm size. Internal sources of productivity growth include managerial talent, quality of factor inputs, information technology, R&D, learning by doing, and innovation (Syverson, 2011). Small and large firms could differ in terms of access to these sources of productivity growth (Leung et al., 2008). External factors such as regulations and access to financing could also be responsible for productivity differentials between small and large firms (Tybout, 2000).

One key study that has attempted to examine whether the learning-by-exporting and self-selection effects are affected by firm size is that of Mez-Castillejo *et al*. (2010). In the study, the authors found that self-selection effects are only binding on small firms whilst learning by exporting effects are relevant to both small and large firms.

Finally, in more recent literature, the role of firm size in trade has been analysed by examining how trade affects firm size distribution. For example, di Giovanni et al. (2011) has showed that the distribution of exporting firms has a lower power law exponent compared to non-exporting firms. The theoretical explanation for this result is that more productive firms are able to sell their products beyond the domestic markets (i.e., abroad). In addition, once a firm starts exporting to a given market, it is easier to export to other markets. In other papers, firm size distributions have important implications for welfare effects and volatility associated with trade (di Giovanni and Levchenko, 2012 and 2013).

3. Methodology

3.1. Theoretical Considerations

How might one think of a theoretical framework for analysing the relationship between firm size, exporting, and productivity? The self-selection hypothesis and

learning-by-exporting hypothesis feature the two distinct views on the relationship between exporting and productivity.

The theoretical argument for the self-selection hypothesis can be found in Melitz (2003), which states that inter-firm productivity differentials amongst an otherwise ex-ante identical potential entrant firms are generated via random draws from a given probability density function. Subsequent works have often adopted the Pareto distribution for productivity, which has the following form:[3]

$$G_\theta(\theta) = 1 - \left(\frac{\theta_{min}}{\theta}\right)^z \quad , \text{ for } \theta \geq \theta_{min} > 0 \text{ and } z > 1$$

Note that there is no direct relationship between productivity and firm size at this stage of the modelling exercise. This size-productivity relationship is only established via a selection process in which less productive firms exit the market whilst the more productive ones continue to grow (size increase).[4] Thus, over time, more productive firms tend to be larger (Melitz, 2003).

The relationship between exporting and productivity is then established by characterizing exporting as an activity that incurs fixed cost. This implies that only firms with (higher) productivity exceeding a given threshold θ^* will be able to export. As productivity is positively related to firm size, larger firms are more likely to be exporters compared to smaller firms. From the perspective of firm size distribution, this implies that trade is associated with lower power law exponent due to its greater impact on large firms (di Giovanni, 2011).

These effects are attenuated by trade liberalisation, which increases the number of potential trading partners and reduces the fixed and variable costs of trading (Melitz, 2003). In so far as productivity is positively related to firm size, trade liberalisation will have greater impact on larger firms. Thus, trade liberalisation is likely to bring about changes in the distribution of productivity and firm size.

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[3] See Helpman et al (2010) and di Giovanni et al (2011).

[4] A stationary equilibrium for productivity distribution is obtained in this model when two conditions are met, namely a zero-cutoff profit condition and a free-entry condition.

Unlike the self-selection hypothesis, the theoretical arguments used to support the learning-by-exporting hypothesis have mainly focused on endogenising the evolution of productivity.[5] This is clearer in De Loecker's (2011) comparison between an exogenous and endogenous model for the evolution of productivity (w):

$$w_{it} = g_1(w_{it}) + \xi_{it+1} \qquad \text{(Exogeneous)}$$

$$w_{it} = g_2(w_{it}, \mathbf{E}_{it}) + \xi_{it+1} \qquad \text{(Endogenous)}$$

where ξ is productivity shock and $\mathbf{E}$ is export experience.

Thus, the learning-by-exporting effects can be better estimated by taking into account productivity gains arising partly from exporting. Furthermore, this suggests the need to control for selection effects when estimating the learning-by-exporting effects (Mez-Castillejo et al, 2010).

The theoretical considerations in the literature suggest that it might be useful to begin with an analysis of the empirical distribution of firm size and productivity. This can be undertaken visually via density plots and more formally by using stochastic dominance tests. Thereafter, this can be followed by testing the self-selection and the learning-by-exporting hypotheses.

3.2. Empirical Models and Specifications

(a) Firm Size And Productivity Distributions

The starting point in analysing exporting and productivity is an analysis of how firm size and productivity are distributed. This can be undertaken by examining the plots for probability density functions for both variables using a non-parametric approach implemented with a kernel density smoother (Cabral and Mata, 2003). Changes in the distribution of firm size and productivity can be discerned by comparing the density plots for years 2002 and 2006.

[5] The exogeneity of productivity change can come from assuming a fixed productivity distribution and a fixed productivity threshold for exporting. It would be interesting to see estimations of productivity thresholds for exporting.

Aside from visual examination, more formal test can be undertaken to examine the nature of the distributions. The Shapiro-Wilk test is used to test whether the size and performance variables are normally or lognormally distributed.

Another approach that has been used to study the relationship between firm size and trade involves the estimation of the power exponent (ξ_{LR}) from firm size distribution. A simple method involves regressing the natural log of ($\text{Rank}_i - 1/2$):

$$ln(\text{Rank}_i - 1/2) = \text{Constant} + \xi_{LR} lnS_i + \varepsilon_i$$

The theory suggests that the exponent of the power law is lower for exporting firms compared to non-exporting firms (di Giovanni, 2011). The Gini coefficient is also used to examine changes in the inequality in firm size and productivity distribution.

(b) Productivity Differentials by Firm Size

Stochastic dominance tests such as the Kolgomorov-Smirnov (KS) test can be used to check for productivity differences between firms belonging to three different size classes (small, medium, and large) for 2002 and 2006. This is done by comparing the productivity distribution functions for the firms (F_t, G_t):

$$F_t(y_t) \text{ vs } G_t(y_t) \ , \ t = 2002, 2006$$

Comparing the test results for two separate periods will help ascertain whether the productivity gap between small, medium, and large firms have diverged over time. The size classification can be further broken down by exporting and non-exporting status and the KS test applied to each sub-category to examine whether firm size and productivity are related to exporting.

(c) Self-Selection and Firm Size

The Kolgomorov-Smirnov test can also be used to test the self-selection hypothesis. As theorized by Melitz (2003), the productivity of export starters exceeds the productivity threshold for exporting θ^* for small, medium, and large firms. In contrast, non-exporters' productivity will be less than θ^*.

Thus, one approach of testing the hypothesis is by comparing at the productivity levels at *t*-1 for firms that started to export at time *t* ($\theta_{t-1}^{exp_t=1}$) with the productivity of non-exporters at *t*-1 ($\theta_{t-1}^{exp_t=0}$). If the hypothesis holds, then:

$$F_{t-1}(\theta^{exp_t=1}) > G_{t-1}(\theta^{exp_t=0})$$

This can be directly tested using the KS test on three classes of firm sizes to see if firm size matters in the self-selection to exporting.

(d) Learning by Exporting and Firm Size

The learning-by-exporting hypothesis can be tested using matching techniques. Matching techniques entail the selection of a control group from non-exporters with similar characteristics as the export starters in the pre-export entry period. The impact of exporting on productivity growth for firm *i*, which started exporting in period *t*, can be expressed as:[6]

$$\Delta y_{i(t-1)+s}^{1} - \Delta y_{i(t-1)+s}^{0}$$

where $\Delta y_{i(t-1)+s}^{1}$ is productivity growth for export starter and $\Delta y_{i(t-1)+s}^{0}$ productivity growth for non-exporter. The average effect can then be expressed as:

$$E(\Delta y_{i(t-1)+s}^{1} \mid D_{it}=1) - E(\Delta y_{i(t-1)+s}^{0} \mid D_{it}=1)$$

where $D_{it} \in \{0,1\}$ is an indicator for non-exporter and exporter.

As $\Delta y_{i(t-1)+s}^{0}$ for an export starter is not observable, the above expression has to be revised by incorporating a counterfactual for the term and a distribution of observable variables (*X*) that affects productivity growth and exporting:

$$E(\Delta y_{i(t-1)+s}^{1} \mid X_{it-1}, D_{it-1}=1) - E(\Delta y_{i(t-1)+s}^{0} \mid X_{it-1}, D_{it}=0)$$

[6] This follows from the exposition in Manjon et al (2013).

The set of variables in *X* includes firm size, foreign ownership, computer utilization, R&D investments, government support, average most favoured nation (MFN) tariff, and industry effects. The matching procedure entails two steps. First, a logit model is used to estimate the probability of starting to export:

$$P(D_{it}=1) = F(X_{it-1})$$

Second, the propensity scores from the above procedure are used to: (1) match the non-exporters and export starters; and (2) compare the productivity growth of similar export starters and non-exporters.

1.3 Data Source and Definitions

(a) Data Source

This study employs manufacturing survey data from the Economic Planning Unit's *Malaysian Knowledge Content Survey* (MKCS). The data cover two periods; namely, 2002 and 2006. The 2002 MKCS and 2006 MKCS contain 1,118 and 1,148 firms, respectively. A balanced panel can be constructed for 753 firms.

Information on exporting status is available as a percentage of total revenues derived from export. The R&D variable is a dummy variable constructed from the R&D expenditure in the datasets. Two sources of government assistance is included: (1) support for research, commercialisation and technology acquisition (Government Research); and (2) support for finance, accounting, and taxation taking the form of advice and referral (Government Finance). Other variables used in the propensity score matching include natural log of the number of computers used, firm size (natural log of number of employees), foreign ownership dummy variable (proxied by foreign head office), percent of employees with degree, and average MFN tariff (trade liberalisation).

(b) Firm Size Definitions

Firm size is classified into four categories based on the official definition used in Malaysia. They are as follows for the manufacturing sector:

- Micro - Annual sales turnover of less than RM250,000 (US$83,300) or full-time employees of less than five.
- Small - Annual sales turnover from RM250,000 (US$83,300) to less than RM10 million (US$3.3 million) or full time employees of from five to less than 50.
- Medium - Annual sales turnover from RM10 million (USD3.3 million) to less than RM25 million (US$8.3 million) or full time employees of between 51 and 150.
- Large - Annual sales turnover exceeding RM25 million (US$8.3 million) or full time employees exceeding 150.

Based on the above definitions, small and medium enterprises (SMEs) are firms with total employees not exceeding 150 employees.

4. Empirical Results

4.1. Summary Statistics

A brief summary statistics of the unbalanced and balanced datasets used in this study is presented in Table 1. Overall, there are significant variations in firm size (measured in terms of number of full-time employees). The mean firm size in MKCS2002 and MKCS2006 fall into the category of "large firm" based on the Malaysian official definition (i.e., more than 150 employees). In the datasets, SMEs account for 70 percent of total firms. This is below the national average of about 98 percent, indicating that the balanced sample contain more large firms compared to the firm population.

The sampling bias can also be detected in terms of the percentage of firms in the datasets that are exporting. About 75 percent of the firms in MKCS2002 are exporters. The incidence of exporting in the MKCS2006 sample is lower at 56 percent. In contrast, the proportion of firms exporting in the 2005 Census is much lower (i.e., between 16 percent to 49 percent). This indicates that both datasets contain a higher proportion of

exporters compared to the national average. The proportion of firms undertaking R&D activities is lower at around 30 percent in both datasets.

Recall that the number of observations in the unbalanced datasets is 1,118 for MKCS2002 and 1,148 for MKCS2006. The balanced dataset has 753 observations. Thus, the balance datasets are about 33 percent smaller than the unbalanced datasets. Despite this reduction in sample size, the characteristics of balance datasets are similar to that of the larger unbalanced datasets. The incidence of exporting and R&D is slightly higher in the balanced datasets compared to the unbalanced datasets.

4.2. Firm Size and Productivity Distributions

The density plot for firm size (number of employees) for unbalanced dataset is presented in Figure 1. Both plots suggest that the distribution of firm size for 2002 and 2006 is non-Gaussian. The mass of the density function is skewed more towards the left compared to the normal distribution, indicating that a very high proportion of the firms are smaller-sized firms. This is clearer in the lognormal plot for firm size distribution (Figure 2). The lower tail of the density functions is higher than what one would expect for the Gaussian distribution. The opposite holds for the upper tail of the distribution.

The non-Gaussian nature of the firm size distribution is confirmed from the Shapiro-Wilks test results. These results are consistent with the general empirical findings on firm size distribution - specifically, that they are skewed (Axtell, 2001) - as well as with the assumptions made in the theoretical literature (Helpman et al, 2004).

The lognormal density plots for firm size distribution for two years (2002 and 2006) using balanced datasets are presented in Figure 3. It would appear that the density plot for 2006 is slightly "flatter" compared to that obtained for 2002, suggesting a greater dispersion of firm size. The fact that the lower and upper tails of the distribution for 2006 is higher than that in 2002 suggests greater inequality in firm size distribution. This is supported by a slight increase in the Gini coefficient for firm size from 0.614 in 2002 to 0.648 in 2006.

A comparison of the productivity distribution for 2002 and 2006 indicates that there is an overall increase in the productivity of firms throughout the 2002-2006 period (Figure 4). More interestingly, whilst almost all exporting firms experienced an

increase in productivity (Figure 5), the same cannot be said of non-exporters (Figure 6). Productivity gains are largest at higher levels of productivity for exporters and non-exporters, suggesting that it might be the larger firms that were experiencing larger productivity gains.

4.3. Productivity Differentials by Firm Size

Results from the Kolgomorov-Smirnov tests indicate that, in general, there is transitivity in productivity across different firm sizes: Large firms have higher productivity than medium-sized firms, which in turn have higher productivity levels than small firms (Table 2). The only exception is the difference in productivity between medium and large firms for year 2002. The productivity gap between these different categories of firm size declines when the 2002 and 2006 datasets are compared. As expected, exporters have higher productivity than the non-exporters. This result is more robust for the 2006 dataset (Table 3). The productivity gap between non-exporters and exporters seems to have declined when the 2002 and 2006 results are compared.

Table 4 summarises the results of the KS test for differences in productivity within samples of small, medium, and large-sized firms. Within each category of firm size, the productivity gaps between exporters and non-exporters are less significant. However, if the productivity gap is compared across firm sizes, it appears that the productivity gap between exporters and non-exporters become less important as firm size increases.

4.4. Self-Selection and Firm Size

A comparison of the stochastic dominance tests for productivity between export starters (in 2006) and non-exporters across different firm sizes yields some interesting results (Table 5). For all firms, export starters generally have higher productivity levels compared to non-exporters (prior to exporting). Even though the productivity gap between export starters and non-exporters is larger for large firms compared to small firms, the statistical significance becomes weaker as firm size increases. This suggests that the role of productivity in self-selection is greater for small firms compared to large firms. This finding is consistent with Mes-Castillejo et al.'s study (2010), which also has found self-selection effects to be binding only on small firms.

One possible explanation for this observation is that small firms that are exporting may be focusing on selling products that are for less sophisticated markets (Mes-Castillejo et al., 2010). There is some indirect evidence for this statement in the sample of firms of this study (Table 6). Smaller firms tend to focus on domestic markets (within state and national). In addition, small exporting firms tend to focus more on ASEAN+3 markets rather than those outside this group (i.e., more advanced markets in the European Union and the United States).

4.5. Learning by Exporting and Firm Size

Results from all three matching estimators were consistent (Table 7). Overall, the differences in productivity growth between exporters and non-exporters were not significant for large firms but were weakly significant for medium-sized firms. The number of observations for small-sized firms was insufficient to apply propensity score matching. This result differs slightly from evidences provided by existence literature, which has found the learning-by-exporting hypothesis to be relevant among firms of different size categories. This difference in results could be because the effects of exporting on productivity growth in this study were only estimated four years after firms started exporting. Additional evidence on annual productivity growth may be required to examine closely the dynamics of productivity growth after firms start to export.

5. Conclusions

Firm size and productivity distributions are found to be both skewed, indicating that inequality is a common feature in the manufacturing sector. When analysed by size, large firms have higher productivity than medium-sized firms, which in turn have higher productivity levels than small firms.

Productivity growth has been an across-the-board feature amongst exporters compared to non-exporters. Overall, exporters are more productive than non-exporters - a finding that is consistent with existing evidences in literature. However, during the 2002-2006 period, the productivity gap between non-exporters and exporters tended to decline with firm size, implying that the relationship between productivity and export is likely to be stronger for small firms compared to large firms. This is consistent with the

finding that the selection effects are binding only for small-sized firms. There is some evidence of learning-by-exporting effects for medium-sized firms but the same cannot yet be concluded for small firms due to insufficient data on this group.

In terms of policy implications, the productivity differentials between exporters and non-exporters suggest that Malaysia should continue to promote export-oriented industrialization to achieve higher productivity-driven growth. Given that productivity differentials are particularly significant for SMEs than for large firms, industrial policies should continue to have a firm size dimension. Different incentives and support services are needed for SMEs and for large firms given the differences in importance of productivity differentials between exporters and non-exporters.

The evidences from this study also suggest that policies that enhance productivity are likely to encourage small firms to start exporting. These include policies that enhance human capital.[7] Foreign participation in SMEs might be another important area of focus given the linkage between export destinations and productivity. Thus, there should be more efforts to push for foreign participation in SMEs, which in turn would encourage the latter to start exporting.

[7] For example, independent variables such as the percentage of employee with degrees are statistically significant in regressions involving labour productivity of small-sized export starters.

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Table 1: Basic Descriptive Statistics.

Unbalanced Data				
Size (employees)	**Mean**	**Std. Dev.**	**Min.**	**Max.**
MKCS2002	202.00	400.00	3.00	6086.00
MKCS2006	230.00	567.00	2.00	9879.00
Size Category	**Small**	**Medium**	**Large**	**Total**
MKCS2002	332.00	441	345	1118
(%)	(29.7)	(39.5)	(30.8)	(100.0)
MKCS2006	389	410	349	1148
(%)	(33.9)	(35.7)	(30.4)	(100.0)
Exporting Status	**Exporter**	**%**	**Non-Exporter**	**%**
MKCS2002	846	75.7	272	24.3
MKCS2006	646	56.3	502	43.7
R&D Activity	**Yes**	**%**	**Non-Exporter**	**%**
MKCS2002	295	26.4	823	73.6
MKCS2006	336	29.3	812	70.7
Balanced Data				
Size (employees)	**Mean**	**Std. Dev.**	**Min.**	**Max.**
MKCS2002	232	442	3.00	6086.00
MKCS2006	263	561	2,00	8471
Size Category	**Small**	**Medium**	**Large**	**Total**
MKCS2002	172	315	266	753
(%)	(22.9)	(41.8)	(35.3)	(100.0)
MKCS2006	189	285	279	753
(%)	(25.0)	(37.9)	(37.1)	(100.0)
Exporting Status	**Exporter**	**%**	**Non-Exporter**	**%**
MKCS2002	586	77.8	167	22.2
MKCS2006	463	61.5	290	38.5
R&D Activity	**Yes**	**%**	**Non-Exporter**	**%**
MKCS2002	225	29.9	528	70.1
MKCS2006	242	32.2	511	67.8

Source: MKCS2002 & MKCS2006, Economic Planning Unit.

Table 2: Differences in Productivity Between Small, Medium, and Large Firms.

MKCS2002, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Small	0.2553	0.088	
Medium	-0.0577	0.883	
Combined KS	0.1572	0.176	0.122
MKCS2006, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Small	0.1313	0.001	
Medium	-0.0024	0.998	
Combined KS	0.1313	0.002	0.002
MKCS2002, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Medium	0.1062	0.504	
Large	-0.0511	0.853	
Combined KS	0.1062	0.883	0.84
MKCS2006, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Medium	0.091	0.044	
Large	-0.0362	0.61	
Combined KS	0.091	0.088	0.075

Source: Author's computation.

Table 3: Differences in Productivity Between Non-Exporters and Exporters.

MKCS2002, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.2149	0.145	
Exporter	-0.0543	0.884	
Combined KS	0.2149	0.288	0.213
MKCS2006, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.1592	0.000	
Exporter	-0.0062	0.979	
Combined KS	0.1592	0.000	0.000

Source: Author's computation.

Table 4: Differences in Productivity Between Non-Exporters and Exporters Across Firm Size Categories.

MKCS2002			
Small Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.2667	0.357	
Exporter	-0.1238	0.801	
Combined KS	0.2667	0.682	0.573
Medium Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.3049	0.251	
Exporter	-0.1473	0.724	
Combined KS	0.3049	0.493	0.364
Large Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.2887	0.723	
Exporter	-0.2324	0.810	
Combined KS	0.2887	0.997	0.990
MKCS2006			
Small Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.2229	0.000	
Exporter	-0.0076	0.990	
Combined KS	0.2229	0.000	0.000
Medium Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.0997	0.140	
Exporter	-0.0566	0.530	
Combined KS	0.0997	0.279	0.240
Large Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.0935	0.347	
Exporter	-0.0492	0.746	
Combined KS	0.0935	0.665	0.608

Source: Author's computation.

Table 5: Differences in Productivity Between Export Starters and Non-Exporters Across Firm Size Categories.

All Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.1612	0.000	
Exporter	-0.0031	0.994	
Combined KS	0.1612	0.000	0.000
Small Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.224	0.000	
Exporter	-0.0076	0.990	
Combined KS	0.224	0.000	0.000
Medium Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.1036	0.000	
Exporter	-0.055	0.539	
Combined KS	0.1036	0.223	0.189
Large Firms, Value Added per Worker			
Smaller Group	**D**	**P-Value**	**Corrected**
Non-Exporter	0.0976	0.308	
Exporter	-0.00534	0.703	
Combined KS	0.0976	0.598	0.539

Source: Author's computation.

Table 6: Main Market Destinations for Firms.

Main Market	Frequency	Percent	Cumulative
All Firms			
Within state	264	35.1	35.1
National	232	30.8	65.9
ASEAN + 3	119	15.8	81.7
International	138	18.3	100.0
Total	753	100.0	
Large Firms			
Within state	56	21.1	21.1
National	84	31.6	52.6
ASEAN + 3	48	18.0	70.7
International	78	29.3	100.0
Total	266	100.0	
Medium Firms			
Within state	126	40.0	40.0
National	95	30.2	70.2
ASEAN + 3	50	15.9	86.0
International	44	14.0	100.0
Total	315	100.0	
Small Firms			
Within state	81	47.4	47.4
National	53	31.0	78.4
ASEAN + 3	21	12.3	90.6
International	16	9.4	100.0
Total	171	100.0	

Source: Author's computation.

Table 7: Productivity Growth for Export Starters.

Sample	Treated	Controls	Difference	S.E.	T-stat	Untreated	Treated	Obs.
Neighbour								
All Firms								
ATT	0.305485	0.324006	-0.01852	0.176939	-0.1	209	373	582
Large								
ATT	0.327929	0.321177	0.006753	0.20889	0.03	136	326	462
Medium								
ATT	0.298447	-0.24962	0.548071	0.353619	1.55	67	35	102
Small								
ATT	.	.	.	.	.	.	.	.
Kernel								
All Firms								
ATT	0.305485	0.316825	-0.01134	0.137164	-0.08	209	373	582
Large								
ATT	0.340984	0.365516	-0.02453	0.17203	-0.14	136	326	462
Medium								
ATT	0.342088	-0.04845	0.390542	0.305772	1.28	67	35	102
Small								
ATT	.	.	.	.	.	.	.	.
Radius								
All Firms								
ATT	0.305485	0.205587	0.099898	0.064824	1,54	209	373	582
Large								
ATT	0.327929	0.298253	0.029676	0.067641	0.44	136	326	462
Medium								
ATT	0.298447	0.07474	0.223707	0.213651	1.05	67	35	102
Small								
ATT	.	.	.	.	.	.	.	.

Source: Author's computation.

Figure 1: Firm Size Distribution (Unbalance), 2002 and 2006.

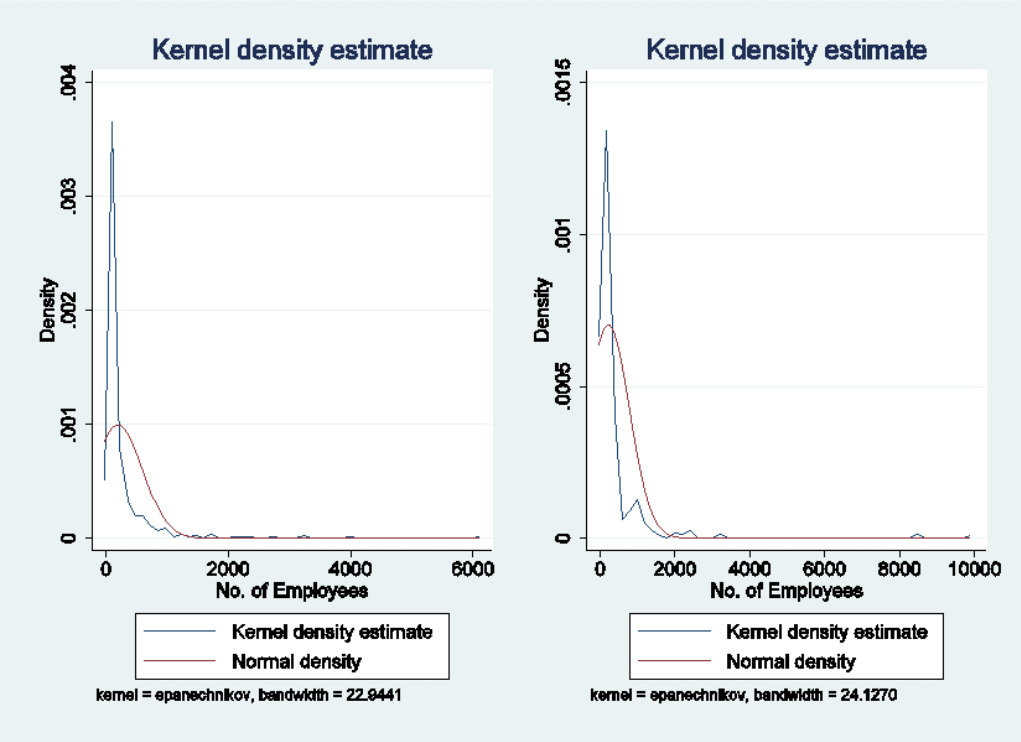

Figure 2: Firm Size Distribution (Lognormal, Unbalanced), 2002 & 2006.

Figure 3: Firm Size Distribution (Balanced), 2002 and 2006.

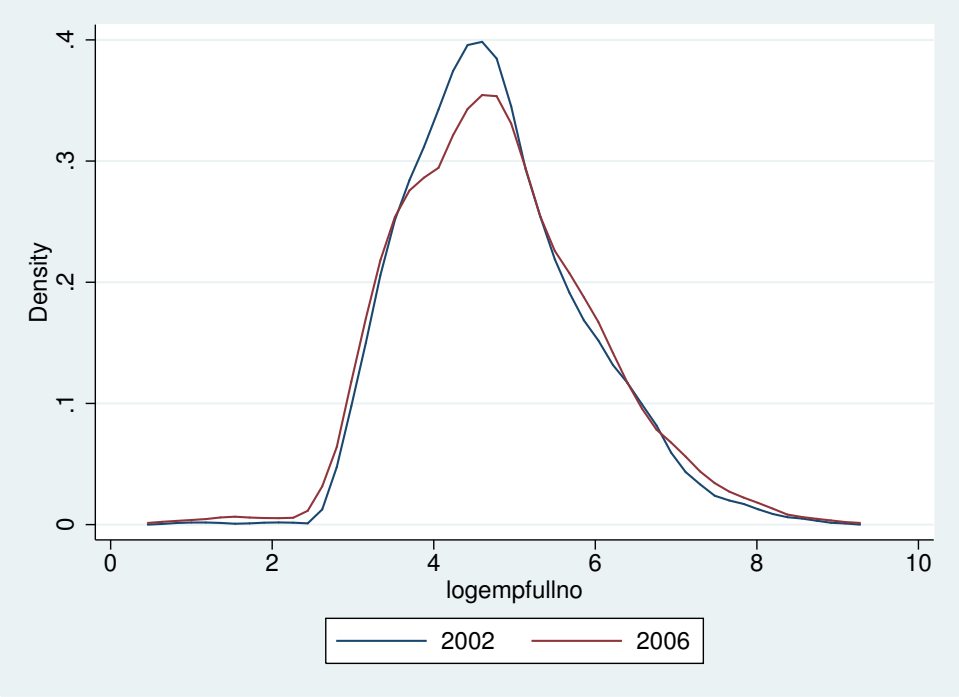

Figure 4: Productivity Distribution (Balanced), 2002 and 2006.

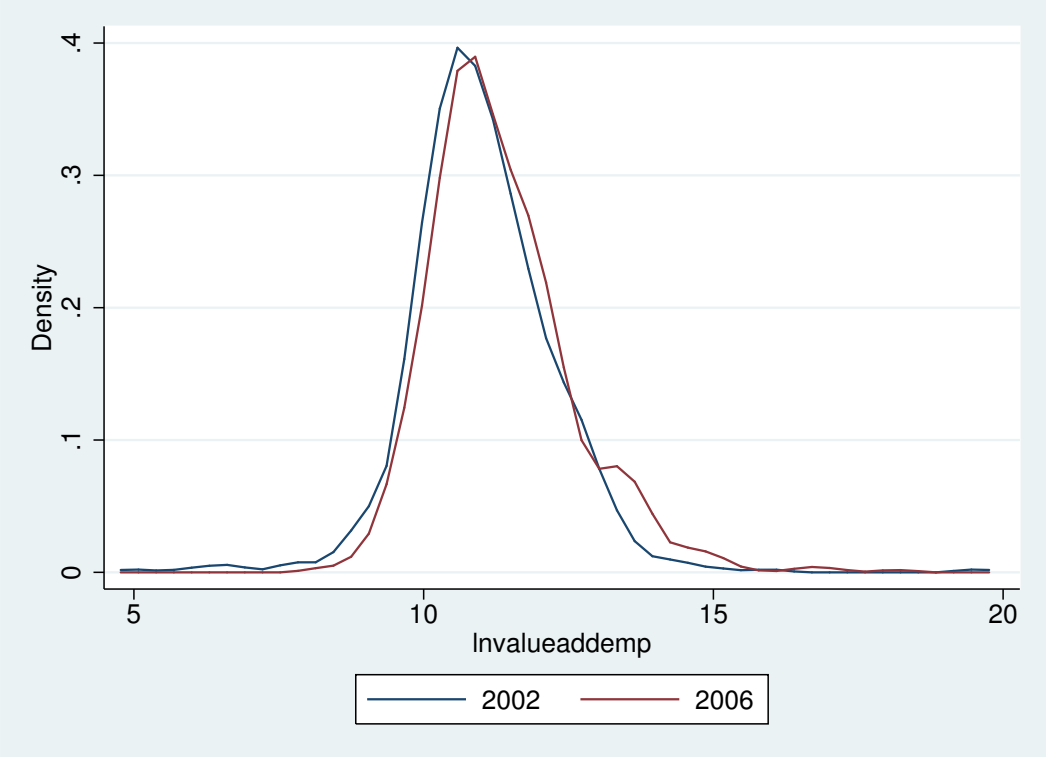

Figure 5: Exporters Productivity Distribution (Balanced), 2002 and 2006.

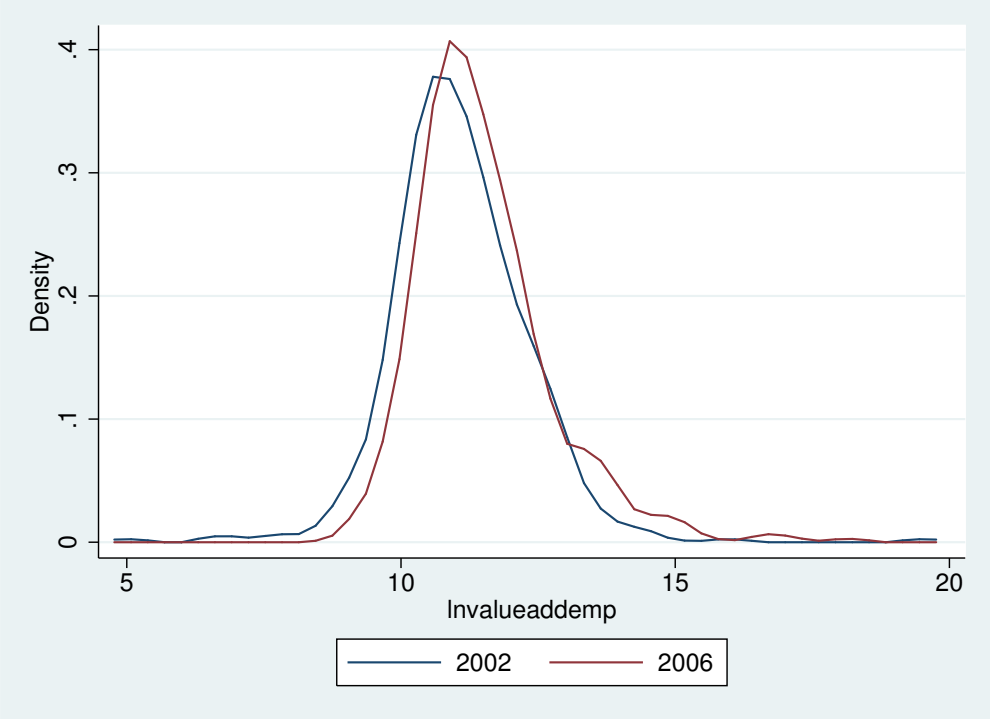

Figure 6: Non-Exporters Productivity Distribution (Balanced), 2002 and 2006.