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# Trade Liberalization and New Exporters' Size: Theory and Evidence

*Short Note*

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## Abstract

This paper tests an empirical implication of Melitz (2003) in the context of falling trade costs, using the EU's intensive liberalization phase (1993–2002) as a natural experiment. Contrary to the model's predictions, firms that switch from non-exporting to exporting over the studied period are not concentrated in a particular size range. Our findings, based on a rich data set of French manufacturing enterprises, suggest scope for fine-tuning of the theoretical framework.

*Keywords:* Entry; Size Distribution of Firms; Intra-industry trade

*JEL Codes:* F12; F14; L11

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## Introduction

The recent focus on intra-industry firm heterogeneity in international trade theory has fostered a rapidly expanding literature. This paper tests a particular implication of the baseline model introduced by Melitz (2003) in the context of trade liberalization. Using a representative sample of French manufacturing firms, we observe that first-order theoretical conjectures are largely in line with the data: both the incidence and the volume of foreign sales increase with firm size. However, contrary to the predictions of the model, the pattern of firms that begin to sell abroad as trade costs decrease provides no evidence of a minimum size threshold for exporting.

The superior performance of exporters relative to non-exporters is well documented in the empirical microeconomic literature.<sup>1</sup> A number of studies have investigated the possibility of self-selection and learning-by-exporting, although evidence on the latter is somewhat inconclusive. Alvarez and López (2005) report both superior ex ante performance and ex post productivity increases among Chilean exporters, and provide an indication that the probability of entering the export market is positively related to plant size.<sup>2</sup> While the findings that firms self-select into export markets are consistent with the Melitz model, theoretical predictions for the consequences of trade liberalization have not yet been empirically investigated.

## Methodology and Data description

In line with the stylized fact that not all firms within an industry export, Melitz (2003) characterized endogenous marginal cost thresholds,  $a_D > a_X$ , for entry in the domestic and the export markets, respectively. The higher sunk investments required to enter foreign markets and the additional transaction cost on sales realized abroad are thus captured in the framework. Ac-

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<sup>1</sup>Bernard and Jensen (2001); Clerides, Lach, and Tybout (1998); see Tybout (2003) for a survey.

<sup>2</sup>They use two dummies defined over the number of employees.

cordingly, very efficient firms find it profitable to sell both locally and abroad, whereas others serve only the domestic market. Firms with marginal costs exceeding  $a_D$  never produce. Freer trade lowers  $a_D$  and raises  $a_X$ , so most entrants into the export market should be clustered around the initial cutoff  $a_X$ . As a firm's choice to sell abroad is directly observable, trade liberalization should result in a bell-shaped pattern of new exporters across the productivity distribution of firms. It is precisely this relationship that we intend to test, using firm size as a proxy for productivity.<sup>3</sup>

The process of European integration, notably the entry into force of the single market programme and the preferential trade agreements preceding eastward enlargement, presents an ideal case of ambitious liberalization. While we cannot rely on a one-time switch of regime to identify the effect of freer trade on firm behavior, we are able to study a sufficiently long period characterized by continuous market opening. Notwithstanding some lags in implementation, the impact on both variable and fixed trade costs is unambiguous. The present analysis is based on standardized annual company accounts, which were obtained from the Amadeus database maintained by Bureau van Dijk Electronic Publishing. This unique pan-European dataset constitutes a compendium of harmonized financial statements, based on registered filings with the respective national statistical offices. We constrain our sample to the unconsolidated accounts of manufacturing firms in France for the years 1993 through 2002. The available data constitute an unbalanced panel of 110,196 enterprises.

To get a general idea of the pattern of entry into the export market, we focus on firms that did not export in 1993 and study the sub-set with positive foreign sales in 2002. If the theoretical prediction is confirmed by the data, we should observe a marked concentration of new exporters relative to the underlying firm distribution, providing an indication of the cut-off value  $a_X$ .

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<sup>3</sup>The theoretical framework relates marginal cost to size. Moreover, any attempt to compute productivity would raise additional questions regarding the appropriate estimation technique.

**Figure 1:** Distribution of New Exporters in 2002

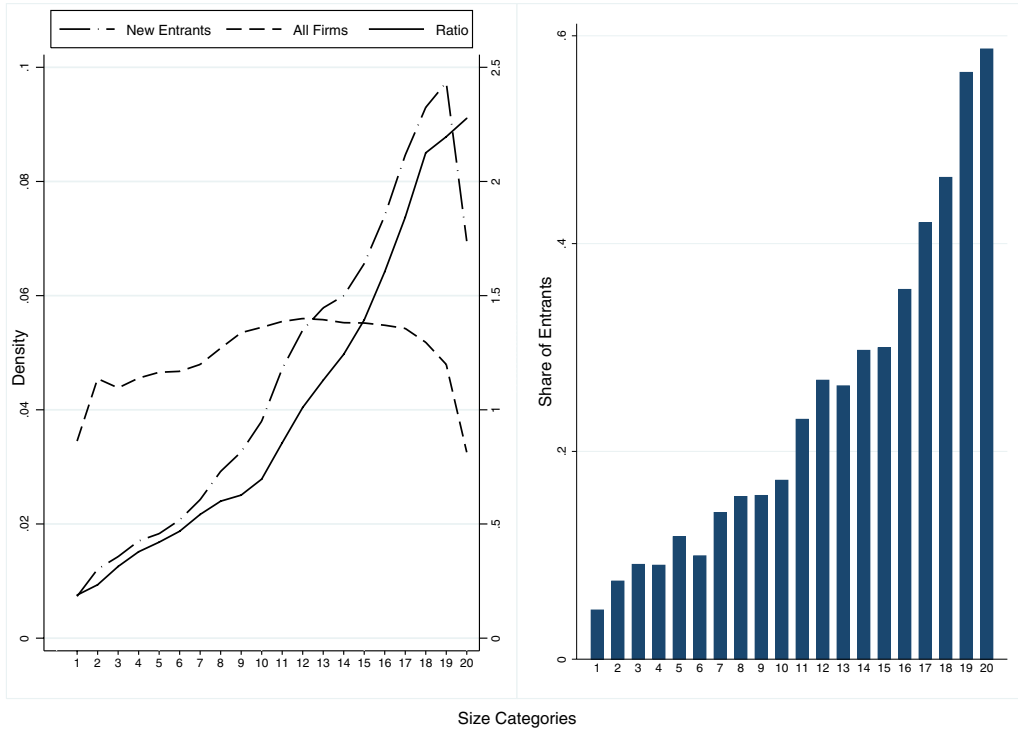


Figure 1 presents exporters among firms that sold only locally in 1993 in terms of kernel density estimates (left panel) and category-specific shares (right panel). Companies are assigned into one of twenty size categories, defined using the corresponding half-deciles of total turnover over the entire period.<sup>4</sup> Statistical evidence, both at the aggregate and sectoral levels (available upon request), does not support the tested theoretical prediction. New exporters are present in each size category and their share among non-exporting firms in 1993 is increasing with size. The ratio of kernel density point estimates rejects the possibility of a peak in the distribution of firms selling abroad, confirming that the observed pattern reflects a declining number of very large firms in the overall sub-sample.

<sup>4</sup>The statistical and empirical results are not sensitive to the number of size categories or alternative methods for their computation (i.e. over a single year of observations or proxying size by total assets).

## Empirical Implementation

To investigate how lower trade costs affect the pattern of entry into the export market, we study the probabilities associated with four possible outcomes,  $\tau$ , defined according to firms' market orientation over two consecutive years. Companies that change trading status relative to the previous year either *enter* or *exit* the export market, whereas those whose status remains unaltered are of the *stay-in* or *stay-out* type. The relationship we propose to estimate is:

$$\Pr(Y_{it} = \tau | Y_{it-1}) = F(\Delta TSL S_{it} + \Delta LSL S_{it} + \beta' \Theta_{it} + \alpha' \Omega_{it} + v_m + \eta_s + \epsilon_{it}) \quad (1)$$

Predictors include one-period differences in total and local sales, and a number of categorical variables.  $\Theta_{it}$  is a vector of 19 dummies reflecting firms' relative size positions in the current period, while  $\Omega_{it}$  accounts for annual fluctuations in individual firm size with a set of 6 dummies - 3 for growth and downsizing, respectively.<sup>5</sup> Companies in the smallest size class that continue to sell only locally are used as the base case. Firms that change export status more than once in the 1993-2002 interval are distinguished by an additional control,  $v_m$ , as they are likely to benefit from previous experience in the form of acquired know-how, established connection with importers, or already incurred sunk costs. Finally,  $\eta_s$  denotes a vector of industry-specific dummies.

Table 1 reports selected results from multinomial logit regressions on annual data.<sup>6</sup> In line with the statistical evidence, our estimates robustly reject the model's prediction of a size range with marked concentration of new exporters.

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<sup>5</sup>We control for upward and downward shifts into an adjacent category, movements spanning 2 to 4 categories, and those extending beyond 4 categories.

<sup>6</sup>Regressions for alternative years and over the 1993-2002 interval, omitted for conciseness, yielded qualitatively identical estimates. The independence of irrelevant alternatives assumption, implicit in multinomial logit models, was violated in our case. Multinomial probit regressions confirmed our results, although computational constraints imposed a specification without industry dummies.

**Table 1: Outcome Probabilities**

Probability	Stay-out		Exit		Enter		Stay-in	
	1994	2002	1994	2002	1994	2002	1994	2002
$\Delta$ Local sales	0.964 (0.227)***	0.576 (0.094)***	0.209 (0.061)***	0.072 (0.017)***	-0.559 (0.127)***	-0.419 (0.067)***	-0.615 (0.137)***	-0.228 (0.047)***
$\Delta$ Total sales	-0.589 (0.190)***	-0.323 (0.082)***	-0.213 (0.061)***	-0.11 (0.031)***	0.314 (0.080)***	0.25 (0.044)***	0.489 (0.119)***	0.183 (0.043)***
Size class 2	-0.002 (0.005)	-0.01 (0.003)***	0.001 (0.002)	-0.001 (0.001)	0 (0.002)	0.005 (0.002)***	0.002 (0.004)	0.006 (0.002)***
Size class 3	-0.013 (0.005)**	-0.021 (0.003)***	-0.002 (0.002)	-0.001 (0.001)	0.001 (0.002)	0.004 (0.001)**	0.014 (0.004)***	0.018 (0.002)***
Size class 4	-0.022 (0.006)***	-0.02 (0.003)***	-0.002 (0.002)	-0.001 (0.001)	0.002 (0.002)	0.004 (0.001)***	0.022 (0.005)***	0.016 (0.002)***
Size class 5	-0.023 (0.006)***	-0.027 (0.003)***	0.002 (0.002)	-0.001 (0.001)	-0.001 (0.002)	0.003 (0.001)**	0.022 (0.005)***	0.025 (0.003)***
Size class 6	-0.039 (0.006)***	-0.038 (0.004)***	0.003 (0.002)	0.001 (0.001)	0.001 (0.002)	0.005 (0.002)***	0.034 (0.005)***	0.032 (0.003)***
Size class 7	-0.046 (0.006)***	-0.057 (0.004)***	0.004 (0.002)*	0.001 (0.001)	0.002 (0.002)	0.009 (0.002)***	0.04 (0.005)***	0.047 (0.004)***
Size class 8	-0.056 (0.007)***	-0.063 (0.005)***	0.004 (0.002)**	0.001 (0.001)	0.003 (0.002)	0.005 (0.002)***	0.049 (0.006)***	0.057 (0.004)***
Size class 9	-0.071 (0.007)***	-0.08 (0.005)***	0.003 (0.002)*	0.002 (0.001)*	0.003 (0.002)	0.009 (0.002)***	0.064 (0.006)***	0.068 (0.004)***
Size class 10	-0.086 (0.008)***	-0.096 (0.006)***	0.007 (0.002)***	0.004 (0.001)***	0.006 (0.002)**	0.009 (0.002)***	0.074 (0.007)***	0.082 (0.005)***
Size class 11	-0.115 (0.009)***	-0.126 (0.007)***	0.007 (0.002)***	0.003 (0.001)**	0.007 (0.002)***	0.012 (0.002)***	0.101 (0.008)***	0.111 (0.006)***
Size class 12	-0.125 (0.009)***	-0.145 (0.007)***	0.005 (0.002)**	0.005 (0.001)***	0.008 (0.002)***	0.01 (0.002)***	0.112 (0.008)***	0.13 (0.007)***
Size class 13	-0.171 (0.010)***	-0.18 (0.008)***	0.009 (0.002)***	0.007 (0.001)***	0.011 (0.003)***	0.015 (0.002)***	0.151 (0.010)***	0.159 (0.008)***
Size class 14	-0.221 (0.012)***	-0.208 (0.009)***	0.01 (0.002)***	0.008 (0.002)***	0.011 (0.003)***	0.015 (0.002)***	0.2 (0.011)***	0.185 (0.008)***
Size class 15	-0.253 (0.013)***	-0.243 (0.010)***	0.013 (0.003)***	0.006 (0.001)***	0.014 (0.003)***	0.014 (0.002)***	0.227 (0.012)***	0.222 (0.009)***
Size class 16	-0.313 (0.014)***	-0.316 (0.011)***	0.012 (0.003)***	0.009 (0.002)***	0.015 (0.003)***	0.016 (0.002)***	0.285 (0.013)***	0.29 (0.011)***
Size class 17	-0.364 (0.014)***	-0.376 (0.012)***	0.016 (0.003)***	0.007 (0.002)***	0.019 (0.003)***	0.019 (0.003)***	0.33 (0.014)***	0.35 (0.012)***
Size class 18	-0.445 (0.015)***	-0.465 (0.013)***	0.014 (0.003)***	0.009 (0.002)***	0.018 (0.003)***	0.021 (0.003)***	0.413 (0.015)***	0.435 (0.013)***
Size class 19	-0.536 (0.015)***	-0.58 (0.013)***	0.014 (0.003)***	0.007 (0.002)***	0.024 (0.004)***	0.024 (0.003)***	0.498 (0.015)***	0.55 (0.013)***
Size class 20	-0.659 (0.014)***	-0.661 (0.013)***	0.014 (0.003)***	0.006 (0.002)***	0.021 (0.004)***	0.016 (0.003)***	0.624 (0.015)***	0.639 (0.013)***
$v_m$	-0.1 (0.013)***	-0.131 (0.011)***	0.051 (0.010)***	0.091 (0.010)***	0.051 (0.010)***	0.039 (0.005)***	-0.001 (0.001)**	0.001 (0.000)**
Observations	33688	64128	33688	64128	33688	64128	33688	64128

Note: Marginal effects of multinomial logit estimation reported. Robust standard errors in parentheses. \*/\*\*/\*\* indicate significance at 10/5/1 %, respectively.

We observe a positive and broadly increasing relation between productivity, proxied by various measures of size, and a company's decision to enter

the export market. The tested hypothesis' rejection is stronger at the end of the studied period, both in terms of magnitude and statistical significance of the size dummies' marginal effects. Nevertheless, the inverse effects of changes in local sales and total turnover on the respective probabilities of serving the domestic and foreign markets support the model's premise on intra-industry firm distinctions.

## Concluding Remarks

The absence of a bell-shaped response to trade liberalization among new exporters suggests scope for fine-tuning of the baseline model. Possible extensions may incorporate asymmetric sunk costs for selling abroad, or time-varying marginal costs for surviving firms.

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