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THE EXCEPTIONAL PERFORMANCE OF EXPORTERS AND LABOR MARKET OUTCOMES: EVIDENCE FROM EGYPTIAN FIRMS

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Abstract

This paper examines the manufacturing export market in Egypt after the Arab Spring using firm level census data from 2013. Exports are quite rare in Egypt, concentrated in few industries and regions, and dominated by the superstar exporters. The estimated conventional export premia are very high, except for firm productivity. Exporters have stark effects on labor market outcomes, including wages, employment, and demand for skilled and female workers, wage inequality, and job security. These findings have two important implications: (1) Manufacturing exports might be monopolized by large but not necessarily the most efficient firms, and (2) promoting exports could potentially improve labor market outcomes by providing good jobs, especially for college graduates and females.

JEL Classification: F10, F14, F16

Keywords: International Trade, heterogeneous firms, export premia, labor market, wage inequality.

ملخص

تبحث هذه الورقة في سوق صادرات الصناعات التحويلية في مصر بعد الربيع العربي وتستخدم بيانات على مستوى الشركات من تعداد عام 2013. والتصدير نادر جدا في مصر، ويتركز في عدد قليل من الصناعات والمناطق، ويهيمن عليه مصدرو القمة. تبين تقديرات عوائد الصادرات التقليدية أنها مرتفعة للغاية، باستثناء إجمالي إنتاجية العامل. وللمصدرين تأثير بالغ على نتائج سوق العمل، بما في ذلك الأجور، والعمالة، والطلب على العمال والعاملات المهرة، وكذلك على الأمن الوظيفي

1 Introduction

Empirical studies in both developed and developing countries have documented salient differences between exporters and nonexporters.[1] These findings not only have important policy implications but also have overturned the classical trade theories, placing firms in the center of trade analysis. The recent trade literature, in large, analyzes the macro-consequences of firms' micro-behavior in the global economy. The implication of firm heterogeneity for trade volume, welfare, aggregate productivity, income distribution, volatility, employment, job creation, resource reallocation and growth cannot be overemphasized in the global economy. Thus, uncovering the nature of firm heterogeneity in Egypt export market is instrumental in understanding the causes and consequences of trade liberalization.

This paper explores the systematic differences between Egyptian exporters and nonexporters in the manufacturing sector using a subsample of Egypt's census data from 2013. The paper confirms the existence of export premia in the manufacturing sector in Egypt for many firm-level outcomes, including size, capital intensity, and productivity, and unveils new export premia specific to the manufacturing sector in Egypt. It also investigates the firm-level variables that are most likely to be associated with export participation and export intensity. In addition to estimating export premia and the determinants of exporting, this paper contributes to the literature by (1) examining the distribution of manufacturing exporters and export sales across two-digit ISIC industries and governorates; (2) analyzing the superstar exporters—their importance, prevalence, and characteristics; (3) studying the interaction between export participation and firm labor market outcomes; and (4) investigating the connection between intra-firm wage inequality and export participation in the manufacturing sector in Egypt.

The main empirical findings of the paper are summarized as three sets of findings. The first set of findings presents the estimation of conventional export premia, determinants of exports, and sectoral heterogeneity: (1) Exporting is a very rare event in Egypt: less than 1% of manufacturers in Egypt export; (2) exporter are markedly different from nonexporters, with estimated export premia much larger than what are typically found in the literature (exporters have about 150% (170%) more sales (workers), 220% more capital intensive, 110% more value added, and 8% more TFP); (3) exporting firms are export market–oriented: around 20% of exporters almost fully ship their product abroad, and the overall average of exports-to-sales is around 0.48; (4) exports are concentrated in few regions and industries: the top five industries and the top six governorates account for almost 80% and 84% of total exports; and (5) firm size and capital intensity are strong predictors of the likelihood of being an exporter. In addition, firms operating in tobacco, chemicals, apparel, pharmaceuticals, rubber and non-metallic mineral industries have higher chances of becoming exporters. Geographical location seems uncorrelated with the probability of being an exporter, except in Port Said governorate.

The second set of findings concerns the anatomy of superstar exporters: (1) Firm size distribution

[1] Notably, Bernard and Jensen (1999, 2004); Bernard et al. (2007) show that a small fraction of US firms export. Importantly, they document that firms that self-select to export are systematically different from nonexporting firms. They show that US exporters are, on average, larger, more productive, and more capital- and skill intensive and pay higher wages. Similar studies have confirmed these findings for other countries as well.

is very skewed in both the domestic and the export markets: the top 1% exporters account for 28% of exports, whereas the top 1% firms dominate 88% of manufacturing output in Egypt and employ 48% of manufacturing workers; (2) conditional on exporting, firm total factor productivity (TFP), size, and capital intensity are strongly correlated with the probability of being a superstar exporter. Superstar exporters that capture large shares of the domestic market triumph over superstar exporters with small or almost zero domestic sales ("only-exporters") in terms of TFP, capital intensity, and employment.

The third set of findings uncovers the interaction between export participation and labor market outcomes: (1) Exporters pay higher wages (90% more), (2) exporters employ more skilled workers (64% more) and provide more secure jobs (8% more), (3) they hire more females (more than 100%), and (4) they pay higher wage skill premium (30% more).

These findings are important in the context of stagnated labor market in Egypt after the Arab Spring, especially for women (Assaad and Krafft, 2015). The paper contributes to the literature emphasizing on the demand side as a leading cause to gender inequality and deteriorating labor market outcomes in Egypt (e.g. Assaad et al., 2018; Aly et al., 2017) by highlighting the importance of exporters in creating favorable labor market outcomes and good jobs. Therefore, policies designed to foster exports could lead to significant improvement in labor market outcomes, including employment, wages, job security, and labor force participation for women.

This paper contributes to the large body of literature addressing the exceptional performance of exporters in many dimensions. The results are congruent with the many studies in this vein (Aw et al., 2000; Bernard and Jensen, 1999, 1997, 2004; Girma et al., 2004; Clerides et al., 1998; Bernard et al., 2007; Baggs, 2005). Two important differences are worthmentioning: (1) Export incidence in Egypt is very low, lower than in any of the previously mentioned studies, and (2) export premia in Egypt are indeed larger than what have found in the literature. From a theoretical perspective, the exceptionally rare exporters and high export premia can be rationalized within the framework of the workhorse model of trade and heterogeneous firms by the presence of enormous fixed costs of exports (Melitz, 2003; Das et al., 2007). This seems to be evident in Egypt. For instance, El-Enbaby et al. (2016) find that non-tariff measurements hinder Egyptian firms from exporting but do not affect current exporters' mean export sales. The low TFP relative to size export premium points to a distorted export market. Perhaps a subset of firms (be politically connected) exploited their political and economic advantages to block at least equally efficient firms from entering the export market and hence grew in size by securing monopolies in export-oriented sectors.[2]

This paper is also related to two strands of literature analyzing the association between exports and labor market outcomes (Feenstra and Hanson, 1996; Helpman et al., 2010; Verhoogen, 2008) and the superstar exporters (Freund and Pierola, 2015; Manasse and Turrini, 2001). The estimated export premia of wage, demand for skilled labor, and skill premium in Egypt's manufacturing sector speak closely to the related literature. This paper contributes to the literature by documenting two novel findings: the demand for females and the job security export premia. To my knowledge, these two premia are not documented in the literature. With regard to the superstar exporters, the skewed

[2]Unfortunately, the data at hand does not allow me to explore this important issue, which I leave to future work.

distribution of export sales resembles the findings of Freund and Pierola (2015). In contrast to Freund and Pierola (2015), this paper formally examines the characteristics of superstar exporters using the order logit regression.

I have utilized various econometric techniques and specifications to establish the results of the current paper. Importantly, I show that the results are not driven by sectoral or regional heterogeneity. Nevertheless, this paper remains agnostic about the causal relationship between export participation and the investigated firm outcomes. The statistically significant findings on export premia are theoretically consistent with two theoretical mechanisms: self-selection (Melitz, 2003; Eaton et al., 2011; Helpman et al., 2010), and the complementarity between exporting and productivity-enhancing investments (Bustos, 2011; Saad, 2017; Aw et al., 2011).[3] Needless to say, the documentation of export premia in the manufacturing sector in Egypt in the current paper is still of great importance from the perspective of policy-making, given the robust association between exports and firm outputs and the large magnitude and economic significance of the export premia.

The rest of the paper is organized as follows: Section 2 describes the data, documents some facts about manufacturing exports and exporters, and provides the estimates of conventional export premia and the determinants of exporting. Section 3 studies superstar exporters. Section 4 investigates the interaction between exporting and labor market outcomes. Section 5 concludes.

2 Data, Descriptive Statistics, and Stylized facts

The data comprise a subsample of 50% of Egypt's census data collected in 2013 by the Central Agency for Public Mobilization and Statistics (CAPMAS). The data was complied and cleaned by the Economic Research Forum (ERF). The total number of manufacturing firms in the final sample is 12,108 firms, of which 9,854 reported positive sales and production in 2013. In the analysis below, I focus on the nonzero production firms, excluding the remaining firms. The data contain rich information about establishment characteristics, including location, two and four-digit ISIC industry, sales, number of workers, capital, intermediate inputs, share of export sales to total sales, share of imported intermediate input, type of establishment, sector, legal status, financial indicators, and starting year. In addition, the dataset includes disaggregated employee data by gender, occupation category, and type of contract (permanent vs. temporary). Table 1 provides the summary statistics for a set of the main variables used in this paper.[4]

I begin the empirical investigation of exporters by analyzing the prevalence of exporters in the two-digit ISIC manufacturing industries classification. Exporting in Egypt is very rare, much lower than the propotion of exporters found in many other studies for developed and developing countries (Bernard et al., 2007; Girma et al., 2004; Brambilla et al., 2015). In the sample, see Table 2, only 4% of the manufacturers were exporters (371 firms out of 9,355). This number masks substantial heterogeneity across two-digit ISIC industries, ranging from 50% in pharmaceutical products to16% and 15% in food products and apparel to almost zero in transport equipment, furniture, and

[3] One needs panel data with firms entering and exiting the export markets to identify the causal effect of exporting on firm outcome.

[4] Given the complex sampling scheme along geography, industry, and firm size, the sampling weights provided by CAPMAS are used in almost all the below analysis.

beverages. The inference about the prevalence of exporters in the population of the manufacturing sector using sampling weights is shown in Table 3. Exporting is extremely rare: On average, less than 0.5% of Egypt manufacturers export. Again, there is great variation across two-digit ISIC industries, ranging from 31% in pharmaceutical to 8% in tobacco products, 6% in chemicals and computers and electronics, 2% in textiles and apparel, and zero in beverages and transportation equipment.[5]

The very small proportion of exporting firms in the manufacturing sector in Egypt could be explained by the high fixed costs of export. According to Melitz (2003), firms with different productivity draws must incur fixed costs of export (be they customization costs, networking costs, etc.) to enter an export destination. Therefore, only firms with productivity realization above a certain productivity threshold (export cutoff) find it profitable to export. In the presence of high fixed costs of exports, few firms decide to export, leading to small proportion of exporters.[6] The variations of the proportion of firms that export is consistent with the neoclassical trade theories and the factor proportions model (Heckscher-Ohlin model). Since Egypt is a labor-intensive country, we should see more firms exporting in labor-intensive industries, such as tobacco, coke and refined petroleum, basic chemicals, and pharmaceutical products.[7]

2.1 Stylized Facts

In this subsection, I present the empirical regularities with regard to exporters, industry, and geography.

Fact 1: Exporters sell large share of their sales abroad

On average, manufacturing exporters sell almost half of their production to foreign markets. The ratio of exports-to-sales (export intensity) varies across industries, ranging from 77% in apparel and 60% in textiles to 22% and 17% in computers and basic metals. Export intensity in Egypt is much higher that what other researchers have found for large and developed countries, where most of firms' (exporters') sales go to the domestic market. However, it is consistent with many findings with regard to export intensity in developing and emerging countries (Bernard et al., 2007; Brambilla et al., 2015). As I discuss later, this result is partially driven by the "only exporting" firms, which sell almost nothing to the domestic market. In the sample, 18% of exporters are "only exporters" (exporting 97% or more of their production) and yet contribute more than 30% to total exports.

[5] The significantly different results between sample and population analysis points to the sampling scheme's bias toward large firms, since exporters tend to be larger than nonexporters; see the analysis below.

[6] Suppose that exporters in (E)gypt face fixed costs of exports to to enter market A which is given by f_{AE}. Decomposing this fixed costs to costs related to Egypt, costs specific to A, and unobserved bilateral factors $f_{AE} = f_E + f_D + \zeta_{AE}$, it is most likely that f_E is very high such, that exporting is very rare in Egypt overall. Estimating the fixed costs of exporting in Egypt is paramount, but I leave this for a future work, since this requires disaggregated trade data by firm-destination.

[7] Another explanation for the small number of exporters is the presence of politically connected firms that might have blocked other equally capable firms from exporting. This is a plausible scenario given the findings below that exporters in Egypt are significantly larger, but slightly more productive, than nonexporters.

Fact 2: Exporting and exporters are concentrated in few industries
The clustering of exporters in few manufacturing industries is easily shown in Table 3. Sixty percent of exporters operate in five industries: apparel (21%), food (12%), chemicals (10%), non-metallic minerals (10%), and rubber and plastic (9%). A comparison between the share of firms in an industry with the industry share of exporters is a good starting point to investigate which industries are relatively conducive to exporting. All the top five exporters-contributing industries fare well using this methodology, except food products in which the share of firms is much large than the share of exporters. Textiles, pharmaceutical products, and basic metals all contribute disproportionately more to the number of exporters relative to their contribution to total number of firms.

A finer analysis can be done by comparing the ratio of industry output to aggregate manufacturing output with the industry contribution to total exports, an exercise I conduct in Table 4. The top five industries in export sales account for almost 80% of total exporters: non-metallic mineral (23%), chemicals (18%), textiles (15%), apparel (12%), and food (12%). Except for food, these industries' contributions to total manufacturing exports are significantly larger than their contributions to total manufacturing output (68% of exports vs. 17% of output). Unsurprisingly, the share of the four industries in total employment is, 0.25, whereas 14% of total value added in the manufacturing sector is originated by the four industries.

To formally test which industries are more conducive to exporting, I run the following Probit regression with export dummy E_{ik}, which equals to one if firm i in industry k and region g exports and zero otherwise, as the dependent variable

$$E_{ikg} = \alpha + \beta \mathbf{X}_{ikg} + \lambda_k + \delta_g + \epsilon_{ikg}, \tag{1}$$

$\mathbf{X}_{ikg}$ is a vector of firm characteristics with the corresponding coefficients vector β, and the error term is denoted by ϵ_{ikg}. The industry and region fixed effects are represented by λ_k and δ_g. In this setting, the estimated values of λ_k reveal the industry-specific factors that contribute to the probability of being an exporter, controlling for firm characteristics. In effect, one can use these estimates to conclude which industries are more conducive to exporting — or, loosely speaking, comparative advantage industries. The estimates of Eq.1 will be fully discussed in Subsection 2.2 and are reported in Table 11. Conditional on firm characteristics and geographic fixed effects, firms have a higher probability of exporting in the following industries: tobacco products, chemicals, apparel, pharmaceutical products, rubber, and non-metallic mineral, in descending order.[8]

Fact 3: Exports and exporters are concentrated in few regions
The analysis here resonates with the analysis in Fact 2, but here I study the distribution of exporters and exports over geographical locations (governorate) instead of industries. The top five governorates account for 80% of exporters, with firms in those five regions adding up to 46% of total manufacturing firms (see Table 5). The contributions of each governorate to total manufacturing output, employment, value added, and exporters are reported in Table 6. Again, the top six gover-

[8] In other words, the coefficients of those industries are positive and statistically significant, with tobacco fixed effect being the largest and non-metallic minerals the smallest. All other industries' fixed effects are either negative, insignificant, or less than that of non-metallic minerals.

norates in export sales make up 84% of total exports, 78% of total output, 61% of total manufacturing employment, and 85% of total manufacturing value added. As in the industry analysis above, I use the estimates of governorate fixed effects, δ_g in Eq.1. In contrast to the industry fixed effects, the governorate fixed effects are mostly insignificant, with few exceptions. Relative to Alexandria and controlling for firm characteristics and industry fixed effects, firms in Port Said have a higher probability of exporting, whereas firms are less likely to export in Damietta, Al-Dakahelya, Al-Sharkeya, and Al-Gabrbeya. This leads to the conclusion that a firm geographical distribution plays a minor role in explaining its propensity to export beyond firm-industry covariates.

Fact 4: Few granular firms dominate manufacturing production and exports
The top 1% exporters account for 28% of the total manufacturing exports in Egypt.[9] The largest 10% export around 65% of total manufacturing exports. The finding that exporting is shaped by the top exporters is widely documented in the literature. In a cross-country study using World Bank Exporter Dynamic Database, Freund and Pierola (2015) find that the top 1% exporters, on average, accounted for 54% of total manufacturing exports during the period of 2004–2008. This share varies from country to country: The share of top 1% exporters in Botswana is 84% and 21% in Bangladesh. Interestingly, they find that the top 1% exporters in Egypt during 2004–2008 contributed 52% to total manufacturing exports.

I also examine the contribution of top 1% firms in total manufacturing output and employment. Table 7 reveals a very skewed distribution of firm size in the manufacturing sector in Egypt. The largest 1% firms produce more than 88% of total Egyptian output and employ more than 48% of workers. The extremely unequal firm size distribution is clearly shown in Figure 1.

2.1.1 Export Premia: Exporters are different

One of the most salient and robust empirical findings in the recent trade literature is that exporters are different from nonexporters. I show that this is also the case for manufacturing exporters in Egypt. I follow the literature in estimating the export premium to document the systematic differences between exporters and nonexporters. Table 8 summarizes the estimated export premia. Specifically, the table reports the coefficients of export dummy E, θ, from the following regressions:

$$y_{ikg} = \alpha + \theta E_{ikg} + \beta \mathbf{X}_{ikg} + \lambda_k + \delta_g + \epsilon_{ikg}, \tag{2}$$

where y_{ikg} is log firm outcome of interest. The remaining variables were defined in Eq.1. The first and second rows in Table 8, for example, show the export premium of firm size measured by log sales and log employment, respectively. Focusing on Model (3), in which I control for firm size (log employment) and industry- and region-fixed effects, exporters have 153% more sales, 67% more workers, 170% more output per worker, 110% more value added, 8.6% more total factor productivity (TFP), and 219% more capital per worker.[10]

[9] The sample (unweighted) contribution of the top 1% exporters is 35%.

[10] The results are little changed once controlled for extra firm characteristics in Model (4): Exporting firms enjoy 100% more sales, 535% more workers, 115% more output per worker, 77% more value added, 8% more TFP, and 216% more capital per worker.These numbers are obtained using the exact percentage differentials, $100(e^{\theta} - 1)$. Firm TFP is calculated as the residual from OLS regression of firm value added on labor and capital, assuming Cobb-Douglas

These findings are in line with the export premia estimates for both developed and developing countries by Clerides et al. (1998) for Morocco, Mexico, and Colombia; Alvarez and Lopez (2005) for Chile; and Aw et al. (2000) for Taiwan and Korea. However, the differences between exporters and nonexporters in Egypt seem to be much larger than what is found in other countries, except for firm TFP. For instance, Bernard et al. (2007) find that, controlling for firm size, exporters in the U.S. have 8% more sales, 10% more value added, and 4% more capital per worker. In the U.K, Girma et al. (2004) find that exporters in the manufacturing sector produce 40% more, hire 30% more workers, and are 10% and 8.3% more productive in terms of labor productivity and TFP, respectively. Isgut (2001) finds that Colombian manufacturing exporters are 123% larger in terms of workers and 43% and 48% more labor-productive and capital-intensive, respectively.

As a robustness check, I replace the export dummy variable with an export intensity measure (ratio of exports sales to total sales) and reestimate Eq.2. The results are robust and little changed, as can be seen in Table 9. In Table 10, I reestimate the export productivity premium as in Eq.2 using different estimation methods of TFP and with bootstrap standard errors instead of robust standard errors. The results are less conclusive, with most estimates being statistically insignificant at conventional levels.[11]

2.2 Determinants of Exporting

In this subsection, I study the joint firm characteristics that are most likely to be associated with export participation. In practice, this can be done by estimating Eq.1 using either the Probit or the Logit model. The first three models in Table 11 report the results of estimating Eq.1. The results show that firm size, measured by the log of the number of workers, and the log capital significantly increase the probability of export. On the other hand, the probability of export increases with firm TFP, but this positive association disappears once we control for the number of workers and the amount of capital. Another important covariate that seems to be strongly associated with the probability of becoming an exporter is whether a firm is an importer (import dummy that equals one if a firm imports some of its intermediate inputs and zero otherwise). Being a private firm (private sector dummy) does not seem to increase the likelihood of exporting, whereas formally registered firms are more likely to export. Older firms are less likely to export; however, the coefficient is slightly significant or insignificant across models. The presence of foreign workers (foreign workers dummy) and whether the firm is an individual entity do not seem to affect the probability of exporting.

Models 4–6 in Table 11 show the OLS estimates of Eq.1 where the export dummy variable is replaced by export intensity. The results are largely unchanged except for the private sector dummy, which becomes positive and significant. To capture any sort of nonlinearity between firm size and the likelihood of exporting, I use size category instead of log workers as an indicator of firm size. Firm size is divided into four groups: small (up to 20 workers), medium (between 21 and 50 workers), large (between 51 and 100 workers), and super large (more than 100 workers). Table

production technology, and then normalized by the two-digit ISIC industry TFP average.

[11] As is well known, using bootstrap standard errors corrects for the bias of conventional robust standard errors when one of the covariates or the dependent variable is generated from a first-stage regression. Nonetheless, the bias in the standard errors tends to be very small as the sample size increases.

12 reports the results using firm size category that otherwise identical to Table 11. Firm size does matter: Medium, large, and super large firms are more likely to export compared to small firms, and the positive impact of size on the probability of export increases as a firm moves from medium to large to super large. The remaining results are very close to the estimates in the original model.

3 The Superstar Exporters: Who Are They?

As stated in Fact 4, a few large firms dominate the manufacturing export market in Egypt. In fact, the largest and the second largest manufacturing exports in the sample account for more than 20% of total manufacturing exports (see Fig.2 graph (d)). Superstar exporters and granular firms are gaining more attention in both trade and macro literature. In a granular economy, individual firm shocks might have significant consequences on the pattern of trade, aggregate trade, and the macroeconomic variables (Gabaix, 2011; Freund and Pierola, 2015). For instance, Freund and Pierola (2015) find that 80% of trade variations can be explained by the variations in the top 1% of exporters' sales. Building on the work of Gabaix (2011), di Giovanni and Levchenko (2012) show that trade magnifies the implications of idiosyncratic shocks to large firms on the aggregate economy. Analyzing large firms and superstar exporters in developing countries is pertinent and important, since these economies feature smaller numbers of firms compared to advanced economies, strengthening the correlation between volatility in the output of large firms and aggregate volatility.

The starting point of analyzing superstar exporters is investigating the correlation between domestic sales and export sales. Theoretically, there is a positive correlation between selling at home and selling abroad (Eaton et al., 2011). Fig.2 shows that there is strong indication of a positive association between domestic sales and exports. Exporters that are big in the domestic market, say in the 90th percentile of the domestic sales distribution, are most likely to be in the 90th percentile of the export sales distribution (graphs a, b, and c of Fig.2). The bottom right graph in the same figure points to a positive correlation between exporters' share of domestic sales and exporters' share of export sales. Nonetheless, there is an obvious disconnect between domestic sales and export sales for a subset of exporters:"only-exporters" sell almost nothing to the domestic market. The majority of only-exporters are big exporters (in the 80th percentile and above) along with a few small exporters (below the 40th percentile).

In Table 20, I take a closer look at exporters that sell more than 90% of their sales to foreign markets. Around half of the only exporters concentrated in two industries: manufacturing of food products and wearing apparel. On the other hand, only exporting is prevalent in the manufacturing wearing apparel where 60% of exporters sell more than 90% of their aggregate sales abroad. The literature offers two explanations for the existence of only exporters: (1) vertical foreign direct investment and export platform, and (2) lucrative foreign markets. Simple descriptive statistics do not support the first explanation as the majority of only exporters are neither a subsidiary to a foreign firm nor hiring foreign workers. Unfortunately, the data at hand does not allow us to investigate the second explanation, i.e., whether only exporters started as successful domestic firms and exporters and evolved to be only exporters taking advantage of lucrative foreign markets. The large firms in both the domestic and the export markets seem to have higher TFP, capital per worker, and number of workers relative to the large only-exporters and exporters with relatively small domestic sales.

To formally test the relationship between domestic sales and export sales, I regress the share of firm exports to total exports, $Exshare_{ikg}$, on the share of firm domestic sales to total domestic sales, $Domshare_{ikg}$, controlling for firm characteristics and industry- and region- fixed effects.

$$Exshare_{ikg} = \alpha_0 + \alpha_1 Domshare_{ikg} + \beta \mathbf{X}_{ikg} + \lambda_k + \delta_g + \epsilon_{ikg}$$

The remaining variables are defined before. The coefficient of interest is α_1, which indicates the change in percentage points in the share of export sales in response to one percentage point change in the share of domestic sales. Table 13 reports the estimated results. There is a significant and large correlation between domestic share and export share in Model (1), in which I only control for industry- and governorate- fixed effects. Expectedly, the coefficient of domestic share loses its significance once firm TFP, capital, and labor controlled for.[12] In the third model of the same table, I drop industry-fixed effect and control for the share of sector exports in total exports. Firm export share is positively but weakly associated with sector exports share.

To identify the firm characteristics that affect the probability of becoming a superstar exporter, I apply the order logistic regression to estimate the following model:

$$P(exporter_i \in pct_j | \mathbf{X}_i) = f(\alpha + \beta \mathbf{X}_i), \qquad for \quad j = 25, 50, 80, 90, 99$$

That is, exporters are divided into six groups based on their percentiles at the export sales distribution. For instance, pct_{25} and pct_{50} refer to the 25th percentile and the 26th–50th percentile range, respectively. pct_{99} denotes the superstar exporters, 99th–100th percentile range (i.e., the top 1% of exporters). Results are reported in Table 14. Firm TFP is highly significant across different econometric specifications. For one unit increase in log TFP, the log odds of being in a higher percentile increases by about two units. The coefficients of firm size category are all highly significant: Being a super large firm increases the log odds of moving to higher percentile by 2.6, much larger than the coefficients of being medium and large (1.5 and 1.8 on average). A one unit increase in log capital increases the log odds of being in a higher percentile by 0.6 on average. In contrast to its effect on becoming an exporter, the Import dummy is significant at 10% in Model 1, but insignificant once I control for more variables in Models 2 and 3. To sum up, among the exporting firms, the ones with the highest TFP, number of workers, and capital value are the firms that dominate the export market (superstar exporters).

4 Exporting and Labor Market

In this section, I explore the relationship between exports, wages, demand for skilled workers, demand for female workers, demand for female skilled workers, job security, and wage skill premium in the manufacturing sector in Egypt. This kind of analysis is particularly important in the case of

[12] In the conical Melitz model with firm–destination specific demand shock, it can be shown that the shares of exports and domestic sales of firm i with productivity ϑ are given by $\frac{f(\varphi)}{A_d+\eta_i}$ and $\frac{f(\varphi)}{A_x+\zeta_i}$. Here $f(.)$ is an increasing function of its argument, A_d and A_x are measures of domestic and export markets, aggregate demand (shifters), η_i and ζ_i are firm-specific demand shocks in domestic and export markets drawn independently from a common joint distribution. Hence, it is easy to see that the population correlation between export and domestic share conditional on productivity is zero.

Egypt. The labor market has being stagnant for protracted periods, especially for young college graduates and females (Assaad and Krafft, 2015; Aly et al., 2017). Trade liberalization induces exporters to expand, be more efficient, produce higher product quality, demand more skilled workers, and pay higher wages. After all, the labor market gains of trade liberalization are best achieved if liberalization induces the economy to create good jobs that pay well.

I estimate the wage export premium following the technique used in estimating Eq.2. That is, I regress log average wage (defined as the total wage bill divided by the number of paid workers) on the export dummy, controlling for firm covariates and industry- and region- fixed effects. Table 15 reports the wage export premium across many regression specifications. The average wage for exporters is on average 90% higher than that for nonexporters. This premium stays highly significant but gets smaller once labor, capital, firm age, and private-owned dummy are controlled for (40%). The estimated wage premia are fairly consistent with what have been found in the literature (Brambilla et al., 2015).

The literature has postulated different mechanisms to explain the wage export premium: skilled labor utilization, technology sophistication, imported input use, and productivity (Brambilla et al., 2015). The presence of imported input, technology sophistication, and productivity mechanisms can be indirectly tested by showing that exporters are more productive, have more capital per worker, and use more imported inputs, results that have been found in the above analysis. The skilled labor utilization assumption will be addressed below. A more direct test for the mechanisms comes from the analysis in Table 15. First, the decline in export premium is evident once I add labor, capital, and import dummy. Adding labor to the regression reduces the export premium from 0.635 to 0.398; adding capital on top of labor further reduces the the export premium to 0.339; the premium drops to 0.287 after adding the import dummy on top of labor and capital. Once all supposedly underlying mechanisms are included (i.e., firm productivity in addition to the import dummy, capital, and labor), the wage export premium becomes insignificant. Differently put, conditional on firm productivity, import status, and capital-labor utilization, exporters and nonexporters pay the same average wage.

To estimate the skilled workers export premium, again I estimate Eq.2 with y_{ikg} representing the ratio of skilled workers to total workers. Due to the lack of data on the education level of workers, the number of skilled workers in each firm is calculated as the number of non-production workers (managers, specialists and technicians, observers and supervisors, administrators and clerks, technical services workers, and sales workers). Results are reported in Table 16. On average, the ratio of skilled workers to total workers for exporters is 32 percentage points higher than for nonexporters (starting to export increases the ratio of skilled workers by 64% since the average skilled labor ratio for nonexporters is about 0.5), controlling for industry and region sector effects. The skilled export premium becomes negative, however, once I add labor, capital, and the import dummy to the regression. This indicates that exporters demand more skilled workers and pay higher wages because they use more sophisticated technology and imported inputs and thus produce higher-quality products, attributes that are complements to skilled workers.

In a related vein, I explore whether exporters provide more job security to their workers by disproportionately hiring more permanent workers. Intuitively, for exporters to attract more skilled

workers, they need not only to pay a wage premium but also to provide a non-wage premium including long-term contracts (more job security). In Table 16, models 5–8, I show that exporters hire more permanent workers relative to total workers than do nonexporters by eight percentage points. To my knowledge, the job security export premium has not been investigated in the literature before.

Exporters hire more females relative to nonexporters. This export premium is not simply driven by sectoral or regional heterogeneity nor by firm size or capital intensity, as illustrated in Table 17. The share of female workers is about five percentage points higher for exporters than for nonexporters, on average. This is indeed a sizable effect. In the weighted sample (population),[13] the ratio of female-to-total workers for nonexporters is 0.03; hence, becoming an exporter increases this ratio by more than 100% compared to a nonexporter with similar level of capital, number ofworkers, and import status. The results are robust using the Logit model in which the dependent variable equals one if a firm hires one or more females and zero otherwise (Models 5–8 in Table 17). Exporters also hire relatively more female workers in the non-production activities (Table 18), but this is simply driven by the higher ratio of female workers for exporters.[14]

4.1 Exporting and wage inequality

The impact of globalization on income inequality is a very timely topic (Piketty and Saez, 2003). Globalization is often blamed for increasing within-country income inequality. An upward trend in income inequality and the volume of world trade can be easily traced in the data for the last thirty years (Goldberg and Pavcnik, 2007). Identifying the impact of trade on income inequality is a challenging task, since the world has been and still is experiencing skilled-biased technological change that undoubtedly contributes to the widening income gap between skilled and unskilled workers. Recently, the literature has shifted from t aggregate to firm-level analysis to tackle the issues of income inequality and globalization (Manasse and Turrini, 2001; Feenstra and Hanson, 1996; Helpman et al., 2010). It has been found that exporting increases the wage gap between skilled and unskilled workers in both developing and developed countries (Verhoogen, 2008; Bernard and Jensen, 1997).

In this paper, I pose the question whether exporting firms in Egypt contribute to the income gap between skilled and unskilled workers within firms. This is an important question, since intra-firm inequalities are more likely to shape the aggregate income inequality. In turn, I estimate the following econometric model:

$$log\left(\frac{w_{skilled}}{w_{all}}\right)_{ikg} = \alpha + \theta E_{ikg} + \beta \mathbf{X}_{ikg} + \lambda_s + \gamma_k + \varepsilon_{ikg}$$

The dependent variable is the log ratio of the average wage of skilled workers to that of all workers in firm i. All other variables are introduced in the above analysis. The model is estimated by the

[13] I use analytical weights to calculate the population means for exporters and nonexporters.

[14] As a robustness check, I reinvestigate the association between export status and the demand for skilled females by estimating a logistic regression model in which the dependent variable is equal to one if a firm hires one or more skilled female and zero otherwise. Again, being an exporter increases the likelihood of employing a skilled female, but the results are driven by the systematic differences between exporters and nonexporters in terms of the size of employees and the value of capital.

OLS and Heckman full maximum likelihood methods. The Heckman selection model is adopted to deal with the concern that many nonexporters do not employ skilled workers. This selection might be nonrandom, and thus OLS results could be biased. Table 19 reports the estimates for export inequality premia for both models. The export premium is highly significant and large for both techniques and robust to the inclusion of firm characteristics. The relative wage of skilled workers in exporting firms is 28% (30% Heckman) higher than the relative wage of skilled labor working for nonexporters.

5 Conclusions

This paper explores the systematic differences between exporters and nonexporters in the manufacturing sector in Egypt using firm-level census data form 2013. The paper documents a very low incidence of exporting in the manufacturing sector compared to what has typically been found in the literature. In line with the ubiquitous findings in the literature, I find that Egyptian exporters are systemically different from nonexporters in many dimensions. The export premia of aggregate employment, sales, capital per worker, value added per worker, and output per worker are highly significant and large. With regard to TFP export premium, the evidence is less conclusive: There is a small export premium, and it is sensitive to the TFP estimation techniques. I also investigate the firm characteristics that are most likely associated with the decision to export, highlighting the role of firm size, and capital intensity and importing intermediate inputs. The paper analyzes the geographical and industrial distribution of manufacturing exports and exporters and finds that manufacturing exports are concentrated in few geographical regions and industries. A major finding of the paper is the very skewed distribution of export and domestic sales and the presence of superstar exporters in Egypt. Superstar exporters dominate a large fraction of the export market in Egypt. Among exporters, the superstars are the most productive, the most capital intensive, and the largest.

This paper presents strong evidence that exporting matters for the outcomes of Egyptian labor market in the manufacturing sector. Exporters pay higher wages, provide better jobs, demand more skilled workers, deliver higher job security, and hire more females. Finally, participation in the export market is associated with increasing intra-firm wage inequality.

The rarity of export incidence and the large export premia lead to the conclusion that firms in Egypt face enormous difficulty to overcome the unrecoverable fixed costs of exports. Therefore, facilitating exports by reducing the burdens imposed on Egyptian firms could lead to remarkable improvement in the stagnant labor market due to the strong association between export status and favorable labor market outcomes documented in this study.

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Table 1: **Descriptive Statistics**

Variable	Nonexporters			Exporters		
	Mean	Std. Dev.	N	Mean	Std. Dev.	N
Sales (Millions EGP)	1.9	8.2	8984	218	1297	371
Total number of workers	6.7	51.7	8984	510	1020	371
Capital (Millions EGP)	.49	1.8	89 84	121	314	371
Average wage	12.0	7.2	7615	28.0	28.8	371
Capital labor ratio (Thousands)	22	91	8984	322	1024	371
Value added per worker (Thousands EGP)	32.5	145	8984	165	751	371
Share of non-production workers	0.46	0.34	8984	0.89	0.18	371
Share of permanent workers	0.96	0.13	8984	0.98	0.08	371
Share of female workers	0.033	0.12	8984	0.188	0.21	371
Age	11.5	12.2	8984	18	16	371
Share of private firms	.99	0.035	8984	.94	0.24	371
Share of formally registered firms	0.17	0.38	8984	0.83	0.38	371

Notes: Data are from the 2013 Egypt subsample of 50% of the Census of Manufacturers. Only firms with positive production during the calendar year of 2013 are included. EGP denotes Egyptian Pound. Analytical weights are used in all descriptive statistics.

Table 2: **Exporting By Egyptian Manufacturing Firms, 2013 (Sample)**

ISIC industry	Exporting Activities								
	Nonexporters			Exporters			Total		
	No.	Row %	Col %	No.	Row %	Col %	No.	Row %	Col %
Manufacture of food products	3023	98	34	58	2	16	3081	100	33
Manufacture of beverages	12	100	0	0	0	0	12	100	0
Manufacture of tobacco products	16	84	0	3	16	1	19	100	0
Manufacture of textiles	283	90	3	31	10	8	314	100	3
Manufacture of wearing apparel	486	90	5	55	10	15	541	100	6
Manufacture of leather and related products	220	97	2	6	3	2	226	100	2
Manufacture of wood and of products of wood and cork..	450	100	5	0	0	0	450	100	5
Manufacture of paper and paper products	207	98	2	4	2	1	211	100	2
Printing and reproduction of recorded media	232	97	3	6	3	2	238	100	3
Manufacture of coke and refined petroleum products	21	95	0	1	5	0	22	100	0
Manufacture of chemicals and chemical products	207	85	2	37	15	10	244	100	3
Manufacture of basic pharmaceutical products..	18	50	0	18	50	5	36	100	0
Manufacture of rubber and plastics products	262	89	3	31	11	8	293	100	3
Manufacture of other non-metallic mineral products	681	96	8	27	4	7	708	100	8
Manufacture of basic metals	137	93	2	11	7	3	148	100	2
Manufacture of fabricated metal products	1059	98	12	23	2	6	1082	100	12
Manufacture of computer, electronic and optical products	46	90	1	5	10	1	51	100	1
Manufacture of electrical equipment	186	90	2	21	10	6	207	100	2
Manufacture of machinery and equipment n.e.c.	105	91	1	10	9	3	115	100	1
Manufacture of motor vehicles, trailers and semi-trailers	70	97	1	2	3	1	72	100	1
Manufacture of other transport equipment	55	100	1	0	0	0	55	100	1
Manufacture of furniture	1082	100	12	5	0	1	1087	100	12
Other manufacturing	126	88	1	17	12	5	143	100	2
Aggregate manufacturing	8984	96	100	371	4	100	9355	100	100

Notes: Data are from the 2013 Egypt subsample of 50% of the Census of Manufacturers. Only firms with positive production during calendar year 2013 are included. For each category, the first column represents the number of firms in the sample belonging to the category for the corresponding two-digit ISIC industry, the second column summarizes the percentage of firms belonging to the category for each specific industry, and the third column reports the percentage of firms belonging to the relevant industry for the specified category.

Table 3: **Exporting By Egyptian Manufacturing Firms, 2013 (Population)**

ISIC industry	Exporting Activities						Firm Mean exports as % Sales
	Nonexporters		Exporters		Total		
	Row %	Col %	Row %	Col %	Row %	Col %	
Manufacture of food products	99.8	27.3	0.2	11.9	100.0	27.3	41.0
Manufacture of beverages	100.0	0.0	0.0	0.0	100.0	0.0	0.0
Manufacture of tobacco products	92.0	0.0	8.0	0.6	100.0	0.0	40.0
Manufacture of textiles	98.0	1.4	2.0	6.8	100.0	1.4	59.0
Manufacture of wearing apparel	98.2	5.0	1.8	21.0	100.0	5.0	77.0
Manufacture of leather and related products	99.8	3.0	0.2	1.3	100.0	3.0	53.0
Manufacture of wood and of products of wood and cork..	100.0	8.3	0.0	0.0	100.0	8.2	0.0
Manufacture of paper and paper products	99.6	0.9	0.4	0.8	100.0	0.9	2.0
Printing and reproduction of recorded media	99.6	1.5	0.4	1.4	100.0	1.5	60.0
Manufacture of coke and refined petroleum products	95.9	0.0	4.1	0.2	100.0	0.0	0.0
Manufacture of chemicals and chemical products	94.2	0.8	5.8	10.6	100.0	0.8	34.0
Manufacture of basic pharmaceutical products	68.4	0.0	31.6	4.2	100.0	0.1	40.0
Manufacture of rubber and plastics products	97.7	1.6	2.3	8.7	100.0	1.6	35.0
Manufacture of other non-metallic mineral products	99.2	5.2	0.8	10.1	100.0	5.3	49.0
Manufacture of basic metals	98.5	0.6	1.5	2.2	100.0	0.6	17.0
Manufacture of fabricated metal products	99.9	17.1	0.1	4.8	100.0	17.0	42.0
Manufacture of computer, electronic and optical products	93.7	0.1	6.3	1.1	100.0	0.1	44.0
Manufacture of electrical equipment	97.5	0.7	2.5	4.3	100.0	0.7	22.0
Manufacture of machinery and equipment n.e.c.	98.3	0.5	1.7	2.0	100.0	0.5	24.0
Manufacture of motor vehicles, trailers and semi-trailers	99.3	0.3	0.7	0.5	100.0	0.3	69.0
Manufacture of other transport equipment	100.0	0.1	0.0	0.0	100.0	0.1	0.0
Manufacture of furniture	100.0	25.0	0.0	1.0	100.0	24.9	48.0
Other manufacturing	94.5	0.5	5.5	6.5	100.0	0.5	43.0
Aggregate manufacturing	99.6	100.0	0.4	100.0	100.0	100.0	48.0

Notes: The population frequencies and the firm mean export shares are obtained by using the probability weights as given in the dataset. The firm mean export as a percentage of total sales is calculated as $\frac{1}{N_j}\sum_{i\in N_j}\frac{exports_i}{sales_i}$, where firm i belongs to the set of exporters N_j in the relevant industry j. The third column reports the fraction of exporters for each two-digit ISIC industry, whereas the fourth column summarizes the distribution of exporters across two-digit ISIC industries.

Table 4: **Sectoral Heterogeneity**

ISIC industry	**Mean**			
	Output Share	Employment Share	Value added Share	Export share
Manufacture of food products	0.16	0.27	0.09	0.11
Manufacture of beverages	0.01	0.00	0.00	0.00
Manufacture of tobacco products	0.01	0.01	-0.05	0.00
Manufacture of textiles	0.03	0.07	0.02	0.15
Manufacture of wearing apparel	0.02	0.09	0.02	0.12
Manufacture of leather and related products	0.01	0.02	0.01	0.00
Manufacture of wood and of products of wood and cork,	0.00	0.03	0.00	0.00
Manufacture of paper and paper products	0.02	0.02	0.01	0.00
Printing and reproduction of recorded media	0.03	0.03	0.02	0.01
Manufacture of coke and refined petroleum products	0.24	0.02	0.62	0.00
Manufacture of chemicals and chemical products	0.05	0.03	0.05	0.18
Manufacture of basic pharmaceutical products	0.03	0.03	0.02	0.03
Manufacture of rubber and plastics products	0.03	0.03	0.01	0.06
Manufacture of other non-metallic mineral products	0.07	0.06	0.06	0.23
Manufacture of basic metals	0.19	0.06	0.04	0.02
Manufacture of fabricated metal products,	0.02	0.08	0.02	0.03
Manufacture of computer, electronic and optical products	0.01	0.01	0.02	0.01
Manufacture of electrical equipment	0.02	0.02	0.02	0.01
Manufacture of machinery and equipment n.e.c.	0.01	0.02	0.01	0.02
Manufacture of motor vehicles, trailers and semi-trailers	0.02	0.01	0.01	0.01
Manufacture of other transport equipment	0.00	0.00	0.00	0.00
Manufacture of furniture	0.01	0.08	0.01	0.00
Other manufacturing	0.01	0.01	0.00	0.01
Total	100.0	1000.0	100.0	100.0

Notes: The columns show the two-digit ISIC industry share of aggregate manufacturing output, aggregate manufacturing employment, aggregate manufacturing value added, and aggregate manufacturing exports, respectively. Probability weights are used to produce the sectoral shares.

Table 5: **Geographical Distribution of Exporters (Population)**

Governorate	Exporting Activities					
	Nonexporters		Exporters		Total	
	Row %	Col %	Row %	Col %	Row %	Col %
Cairo	99.2	19.7	0.8	36.7	100.0	19.7
Alexandria	99.2	7.1	0.8	13.4	100.0	7.1
Port Said	96.5	0.4	3.5	3.5	100.0	0.4
Suez	99.2	0.3	0.8	0.7	100.0	0.3
Damietta	100.0	7.9	0.0	0.4	100.0	7.8
Al-Dakahleya	100.0	8.3	0.0	0.4	100.0	8.3
Al-Sharkeya	99.5	6.1	0.5	7.1	100.0	6.1
Al-Kalyoubeya	99.4	5.4	0.6	7.5	100.0	5.4
Kafr Al-Sheikh	99.9	1.9	0.1	0.4	100.0	1.9
Al-Gharbeya	99.8	7.6	0.2	2.7	100.0	7.6
Al-Monoufeya	99.3	4.0	0.7	6.5	100.0	4.1
Al-Beheira	99.8	3.5	0.2	1.3	100.0	3.5
Al-Ismaeliya	99.7	1.9	0.3	1.2	100.0	1.9
Al-Giza	99.2	8.3	0.8	15.8	100.0	8.3
Beni Suwif	99.8	1.7	0.2	0.6	100.0	1.7
Al-Fayum	100.0	2.6	0.0	0.0	100.0	2.6
Al-Meniya	100.0	3.9	0.0	0.2	100.0	3.9
Asiyut	100.0	1.5	0.0	0.0	100.0	1.5
Sohag	100.0	2.1	0.0	0.0	100.0	2.1
Qena	99.9	2.9	0.1	0.4	100.0	2.9
Aswan	99.8	0.8	0.2	0.4	100.0	0.8
Luxor	100.0	0.9	0.0	0.0	100.0	0.9
Red Sea	100.0	0.2	0.0	0.0	100.0	0.2
Al-Wadi Al-Gadid	100.0	0.2	0.0	0.0	100.0	0.2
Matruh	99.7	0.4	0.3	0.2	100.0	0.4
Northern Sinai	99.7	0.3	0.3	0.2	100.0	0.3
Southern Sinai	98.8	0.1	1.2	0.2	100.0	0.1
Total	99.6	100.0	0.4	100.0	100.0	100.0

Notes: The first and third columns' numbers show the percentage of nonexporters and exporters in the manufacturing industry for each governorate. The second and fourth columns' numbers summarize the distribution of nonexporters and exporters across governorates. Probability weights are used to obtain the estimated population percentages reported in the table.

Table 6: **Geographical Distribution of Export Sales**

Governorate	**Mean**			
	Output Share	Employment Share	Value Added Share	Exports Share
Cairo	0.34	0.26	0.16	0.36
Alexandria	0.21	0.10	0.52	0.07
Port Said	0.01	0.01	0.00	0.07
Suez	0.02	0.01	0.11	0.11
Damietta	0.01	0.03	0.01	0.04
Al-Dakahleya	0.01	0.04	0.01	0.00
Al-Sharkeya	0.10	0.11	0.06	0.15
Al-Kalyoubeya	0.04	0.08	0.03	0.03
Kafr Al-Sheikh	0.02	0.01	0.01	0.00
Al-Gharbeya	0.02	0.06	0.02	0.01
Al-Monoufeya	0.04	0.03	0.01	0.02
Al-Beheira	0.01	0.02	0.00	0.00
Al-Ismaeliya	0.01	0.02	0.00	0.01
Al-Giza	0.10	0.12	-0.01	0.08
Beni Suwif	0.01	0.01	0.00	0.02
Al-Fayum	0.00	0.01	0.00	0.00
Al-Meniya	0.01	0.02	0.02	0.00
Asiyut	0.03	0.01	0.03	0.00
Sohag	0.00	0.01	0.00	0.00
Qena	0.00	0.02	0.00	0.01
Aswan	0.01	0.01	0.00	0.01
Luxor	0.00	0.01	0.00	0.00
Red Sea	0.00	0.00	0.00	0.00
Al-Wadi Al-Gadid	0.00	0.00	0.00	0.00
Matruh	0.00	0.00	0.00	0.00
Northern Sinai	0.00	0.00	0.00	0.00
Southern Sinai	0.00	0.00	0.00	0.00
Total	100.0	100.0	100.0	100.0

Notes: The columns show the two-digit ISIC industry share of aggregate manufacturing output, aggregate manufacturing employment, aggregate manufacturing value added, and aggregate manufacturing exports, respectively. Probability weights are used in calculating the shares.

Table 7: **Distribution of Exports, Sales, and Employment by Percentiles**

Percentiles	Export Sales	Total Sales	Total Employment
0-50	0.0191***	0.0115***	0.114***
	(4.04)	(5.30)	(20.93)
50-80	0.151***	0.0216***	0.144***
	(3.57)	(5.38)	(23.37)
80-90	0.182*	0.0147***	0.0832***
	(2.29)	(5.47)	(23.91)
90-99	0.367***	0.0644***	0.171***
	(5.55)	(7.26)	(14.96)
99-100	0.281**	0.888***	0.487***
	(3.03)	(54.20)	(27.96)
Observations	371	9355	9355

t statistics in parentheses

Notes: * ($p \leq 0.05$), ** ($p \leq 0.01$), *** ($p \leq 0.001$). The table is produced using the *pshare* Stata command with probability weights. The numbers in each column report the share of the percentile specific in the relevant row. For instance, the top 1% of exporters accounted for about 28% of aggregate exports, 89% of total sales, and 49% of total employment in the manufacturing sector. The standard errors are calculated using the delta method.

Table 8: **Exporter Premia in Egyptian Manufacturing, 2013**

	Export premia			
	(1)	(2)	(3)	(4)
Log Sales	5.18***	4.6***	0.93***	0.71***
Log Employment	3.75***	3.3***	2.04***	1.85***
Log output per worker	1.39***	1.24***	1.0***	0.77***
Log vale-added per worker	1.07***	0.98***	0.74***	0.57***
Log TFP	0.076***	0.092***	0.083**	0.079*
Log capital per worker	2.065***	1.93***	1.16***	1.16***
Additional Covariates	None	Industry and Gov. Fixed Effects	(2) + Log Employment	(3)+†

Notes: * ($p \leq 0.05$), ** ($p \leq 0.01$), *** ($p \leq 0.001$). All results obtained by simple ordinary least squares regressions (OLS) of the firm characteristic in the first column on a dummy variable of export E. Model (1) only includes E; Model (2) includes E and industry-governorate fixed effects as control variables. Model (3) adds log employment to Model (2) as an additional control variable. For log employment regression, I control for log capital. Model (4) includes additional firm characteristics as control variables, † including firm age, private sector dummy, a dummy if formally registered, and log capital. Firm total productivity TFP is first obtained as a residual from OLS regression of firm value added on labor and capital where Cobb-Douglas production function specification is assumed. Then, I express TFP for each firm relative to the industry mean TFP. That is, for firm i in industry j, $TFP_i = TFP_i / \sum_{i \in j} TFP_i$. Probability weights are included in all regressions.

Table 9: **Exporter Premia in Egyptian Manufacturing, 2013 (Continuous treatment)**

	Export premia			
	(1)	(2)	(3)	(4)
Log Sales	6.34^{***}	5.7^{***}	1.09^{***}	0.81^{***}
Log Employment	4.7^{***}	4.1^{***}		2.4^{***}
Log output per worker	1.6^{***}	1.5^{***}	1.15^{***}	0.88^{***}
Log vale-added per worker	1.35^{***}	1.28^{***}	0.95^{***}	0.74^{***}
Log TFP	0.12^{***}	0.12^{***}	0.1^{*}	0.09^{*}
Log capital per worker	2.5^{***}	2.38^{***}	1.37^{**}	1.34^{**}
Additional Covariates	None	Industry and Gov. Fixed Effects	(2) + Log Employment	(3)+†

Notes: * ($p \leq 0.05$), **($p \leq 0.01$), *** ($p \leq 0.001$). All results obtained by simple ordinary least squares regressions (OLS) of the firm characteristic in the first column on the share of firms exports relative to sales SE. Model (1) only includes SE; Model (2) includes SE and industry-governorate fixed effects as control variables. Model (3) adds log employment to Model (2) as an additional control variable. Model (4) includes additional firm characteristics as control variables, † including firm age, private sector dummy, a dummy if formally registered, and log capital. Firm total productivity TFP is first obtained as a residual from OLS regression of firm value added on labor and capital where Cobb-Douglas production function specification is assumed. Then, I express TFP for each firm relative to the industry mean TFP. That is, for firm i in industry j, $TFP_i = TFP_i / \sum_{i \in j} TFP_i$. Probability weights are included in all regressions.

Table 10: **Productivity Premium of Exporting**

	(1)	(2)	(3)	(4)	(5)	(6)
Exporting Activities	0.00844	0.0834^{+}	0.00844	0.0834^{*}	0.0264	0.0431
	(0.0456)	(0.0468)	(0.0311)	(0.0329)	(0.0277)	(0.0293)
Observations	9125	9126	9125	9126	9128	9125

Notes: The productivity premium is estimated from regression TFP on a dummy of export participation, log employment, and industry and governorate fixed effects. In Models (1) and (2), TFP is estimated based on the Translog and Cobb Douglas technologies, respectively, with bootstrapped standard errors based on 500 draws. Models (3) and (4) are similar to (1) and (2) with robust standard errors. In Models (5) and (6), the TFP is based on Translog and Cobb Douglas technologies with varying slopes and coefficients across industries and robust standard errors. Industry and region fixed effects and log labor are included in all models. Probability weights are used in all regressions. Standard errors are shown in parenthesis: $^{+}$ ($p \leq 0.1$), *($p \leq 0.05$).

Table 11: **Determinants of Exporting**

	(1) Export dummy	(2) Export dummy	(3) Export dummy	(4) Export ratio	(5) Export ratio	(6) Export ratio
Log TFP	0.436**	0.113	0.128	0.217*	0.178*	0.130
	(0.194)	(0.190)	(0.195)	(0.115)	(0.108)	(0.0982)
Import_dummy	0.880***	0.605***	0.614***	0.790***	0.644***	0.582***
	(0.121)	(0.171)	(0.172)	(0.181)	(0.163)	(0.148)
Age	0.00761	-0.0153	-0.0161*	0.00200	-0.0163***	-0.0131***
	(0.00738)	(0.00964)	(0.00966)	(0.00519)	(0.00591)	(0.00472)
Age_square	-0.000135	0.000121	0.000128	-0.000133	0.0000757	0.0000504
	(0.0000977)	(0.000116)	(0.000116)	(0.0000859)	(0.0000885)	(0.0000827)
Private sector dummy	-1.635***	0.0134	0.125	-2.096**	2.033*	2.150*
	(0.218)	(0.258)	(0.266)	(0.847)	(1.155)	(1.218)
Registration license dummy	1.026***	0.239*	0.234*	0.830***	0.207**	0.180**
	(0.121)	(0.134)	(0.136)	(0.146)	(0.0823)	(0.0814)
Log labor		0.459***	0.454***		0.997***	0.946***
		(0.0593)	(0.0602)		(0.149)	(0.143)
Log capital		0.123***	0.125***		0.0983**	0.0831***
		(0.0473)	(0.0480)		(0.0385)	(0.0295)
Foreign workers dummy			-0.272			5.808
			(0.344)			(8.781)
Type of establishment dummy			0.159			0.403
			(0.124)			(0.675)
Region fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Two-digit ISIC fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Estimation Method	Probit	Probit	Probit	OLS	OLS	OLS
Observations	7795	7795	7795	9126	9126	9126

Notes: TFP is the residual of OLS regression of firm log value added on log labor and log capital and is expressed relative to two-digit ISIC industry mean TFP. The dependent variable in the last three columns is the ratio of export sales to total sales. Import dummy equals one if a firm imports some (all) of its intermediate inputs. Foreign worker dummy equals one if a firm hires foreign workers and zero otherwise. Types of establishment dummy is set to one if a branch or headquarters and zero if a single entity. Sector equals one if private and zero if public. Registration license dummy equals one if a registered firm and zero otherwise. The standard errors for OLS estimators are based on the bootstrap method with 100 repetitions. Probability weights are used in all regressions. Standard errors in parentheses. * ($p \leq 0.1$), ** ($p \leq 0.05$), *** ($p \leq 0.01$)

Table 12: **Determinants of Exporting: Non-linear Size Effect**

	(1) Export Dummy	(2) Export Dummy	(3) Exports to Sales Ratio	(4) Exports to Sale Ratio
Log TFP	0.0306	0.0589	0.0119	0.0183
	(0.184)	(0.189)	(0.0775)	(0.0711)
Import dummy	0.557***	0.571***	0.372**	0.373***
	(0.159)	(0.161)	(0.147)	(0.135)
Size Category				
medium	0.430**	0.422**	0.656**	0.696**
	(0.168)	(0.170)	(0.316)	(0.318)
large	1.240***	1.232***	7.605***	7.679***
	(0.200)	(0.202)	(1.852)	(1.869)
super large	1.468***	1.459***	13.04***	13.23***
	(0.235)	(0.235)	(2.671)	(2.418)
Log capital	0.197***	0.200***	0.0712**	0.0740***
	(0.0468)	(0.0470)	(0.0287)	(0.0284)
Age	-0.0135	-0.0151*	-0.00309	-0.00307
	(0.00846)	(0.00847)	(0.00547)	(0.00405)
Age square	0.000129	0.000142	-0.0000257	-0.0000282
	(0.0000964)	(0.0000961)	(0.0000716)	(0.0000646)
Sector	-0.330	-0.228	8.072***	7.580***
	(0.228)	(0.241)	(2.305)	(1.983)
Registration license dummy	0.255**	0.251*	0.111	0.116*
	(0.127)	(0.129)	(0.0683)	(0.0653)
Foreign workers dummy		-0.432		0.0889
		(0.345)		(6.120)
Type of establishment dummy		0.135		-0.705
		(0.125)		(0.722)
N	7795	7795	9126	9126

Notes: TFP is the residual of OLS regression of firm log value added on log labor and log capital and is expressed relative to two-digit ISIC industry mean TFP. Import dummy equals one if a firm imports some (all) of its intermediate inputs. Registration license dummy equals one if a registered firm and zero otherwise. Foreign worker dummy equals one if a firm hires foreign workers and zero otherwise. Types of establishment dummy is set to one if a branch or headquarters and zero if a single entity. The reference group for size is Small ($\leq$ 20 workers). Medium, Large, and Super large refer to firm sizes with 21–50, 51–100, and more than 100 workers, respectively. Probability weights are used in all regressions. Standard errors in parentheses. * ($p \leq 0.1$), **($p \leq 0.05$), *** ($p \leq 0.01$)

Table 13: **Domestic Sales and Export Sales**

	(1)	(2)	(3)
	Dep. variable: Firm share of total exports		
Firm share of domestic sales	1.883**	1.527	0.00845
	(0.770)	(1.094)	(0.0698)
Log TFP		0.00201	0.00274***
		(0.00129)	(0.00102)
Import dummy		-0.00104	-0.000743
		(0.00123)	(0.00121)
Log Capital		0.000705**	0.000879***
		(0.000273)	(0.000235)
Log labor		0.000660	0.000864*
		(0.000531)	(0.000518)
Sector share of exports			0.0118*
			(0.00712)
Industry fixed effect	YES	YES	NO
Gov. Fixed effect	YES	YES	YES
Other Covariates	NO	YES	YES
N	371	359	359

Notes: TFP is the residual of OLS regression of firm log value added on log labor and log capital and is expressed relative to two-digit ISIC industry mean TFP. Import dummy equals one if a firm imports some (all) of its intermediate inputs. Probability weights are used in all regressions. Standard errors in parentheses. * ($p \leq 0.1$), ** ($p \leq 0.05$), *** ($p \leq 0.01$)

Table 14: **Determinants of Superstar Exporters: Order Logit**

	(1)	(2)	(3)
Log TFP	2.133***	2.089***	2.042***
	(0.623)	(0.601)	(0.576)
Import dummy	0.494*	0.458	0.459
	(0.289)	(0.302)	(0.313)
Firm Size dummies			
Medium	1.372***	1.426***	1.786***
	(0.508)	(0.524)	(0.539)
Large	1.751***	1.825***	2.222***
	(0.585)	(0.616)	(0.620)
Super Large	2.402***	2.327***	2.962***
	(0.495)	(0.500)	(0.510)
log capital	0.597***	0.613***	0.694***
	(0.0971)	(0.0967)	(0.157)
Sector exports percentiles dummies			
50 percentile		1.287	1.617*
		(0.855)	(0.943)
80 percentile		1.393*	1.518*
		(0.831)	(0.900)
98 percentile		1.881**	2.021**
		(0.912)	(0.962)
99 percntile		0.957	1.400
		(0.880)	(0.956)
Firm domestic sales percentile dummies			
50 percntile			-1.215***
			(0.352)
80 percentile			-1.532***
			(0.439)
90 percentilel			-1.680***
			(0.649)
98 percentile			-0.893
			(1.239)
99 percentile			-0.124
			(1.140)
cons	17.22***	18.94***	20.71***
	(2.302)	(2.532)	(3.237)
Other Covariates	YES	YES	YES
N	359	359	359

Notes: TFP is the residual of OLS regression of firm log value added on log labor and log capital and is expressed relative to two-digit ISIC industry mean TFP. Import dummy equals one if a firm imports some (all) of its intermediate inputs. The reference group for size is Small (≤ 20 workers). Medium, Large, and Super Large refer to firm sizes with 21–50, 51–100, and more than 100 workers, respectively. The 50th percentile sector exports dummy, for example, equals one if a firm belongs to an industry in the 50th percentile of the exports distribution. The 80th percentile firm domestic sales percentile dummy, for example, equals one if the firm is between the 50th–80th percentile of domestic sales distribution and zero otherwise. Probability weights are used in all regressions. Standard errors in parentheses. * ($p \leq 0.1$), **($p \leq 0.05$), *** ($p \leq 0.01$)

Table 15: **Wage Export Premium**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Variable: Firm Average wage							
Export dummy	0.647***	0.635***	0.398***	0.339**	0.179^{+}	0.287**	0.141
	(0.0913)	(0.0919)	(0.111)	(0.110)	(0.0923)	(0.108)	(0.0904)
Log labor			0.0774***	0.0106	0.0345	0.0118	0.0351
			(0.0231)	(0.0275)	(0.0250)	(0.0271)	(0.0247)
Log capital				0.0510***	0.00659	0.0492***	0.00561
				(0.0126)	(0.0122)	(0.0123)	(0.0120)
Age				0.000535	0.00145	0.000587	0.00148
				(0.00105)	(0.000979)	(0.00102)	(0.000954)
Registration license dummy				-0.0767*	-0.0730*	-0.0845*	-0.0789*
				(0.0372)	(0.0331)	(0.0371)	(0.0331)
Sector				-0.962***	-0.881***	-0.935***	-0.862***
				(0.103)	(0.0882)	(0.102)	(0.0869)
Log output per worker					0.258***		0.255***
					(0.0197)		(0.0194)
Import dummy						0.140**	0.106**
						(0.0451)	(0.0405)
2-digit ISIC dummy	No	YES	YES	YES	YES	YES	YES
Governorate dummy	No	YES	YES	YES	YES	YES	YES
N	7986	7986	7986	7847	7847	7847	7847

Standard errors in parentheses
$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 16: **Skilled Labor and Job Security Export Premia**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Share of skilled workers				Dependent variable:Share of permanent workers			
Exp dummy	0.321***	-0.508***	-0.499***	-0.492***	0.0167*	0.0848***	0.0826***	0.0827***
	(0.0287)	(0.0489)	(0.0492)	(0.0496)	(0.00774)	(0.0115)	(0.0117)	(0.0123)
Log labor		0.251***	0.261***	0.262***		-0.0206***	-0.0241***	-0.0241***
		(0.00662)	(0.00800)	(0.00801)		(0.00241)	(0.00326)	(0.00327)
Log capital			-0.00832*	-0.00804*			0.00285	0.00285
			(0.00398)	(0.00397)			(0.00206)	(0.00203)
Import dummy				-0.0205				-0.000280
				(0.0156)				(0.00839)
2-digit ISIC FE	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
N	9355	9355	9212	9212	9355	9355	9212	9212

Standard errors in parentheses
$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17: **Female Labor Export Premium**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Dependent variable: Share of female workers				Dependent variable: Female worker dummy			
Export dummy	0.0887***	0.0367^{+}	0.0382^{+}	0.0377^{+}	3.360***	0.953*	0.932*	0.864^{+}
	(0.0173)	(0.0194)	(0.0196)	(0.0198)	(0.401)	(0.467)	(0.473)	(0.489)
Log labor		0.0158***	0.0183***	0.0183***		0.991***	0.948***	0.946***
		(0.00310)	(0.00345)	(0.00346)		(0.0977)	(0.120)	(0.121)
Log capital			-0.00204	-0.00206			0.0281	0.0239
			(0.00130)	(0.00129)			(0.0560)	(0.0549)
Import dummy				0.00157				0.210
				(0.00650)				(0.318)
2-digit ISIC FE	YES	YES	YES	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES	YES	YES	YES
Estimation method	OLS	OLS	OLS	OLS	Logit	Logit	Logit	Logit
N	9355	9355	9212	9212	9355	9355	9212	9212

Standard errors in parentheses
$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18: **Skilled Female Labor Export Premium**

	(1)	(2)	(3)	(4)	(5)
Dependent variable: Share of Skilled female workers of total skilled workers					
Export dummy	0.0591**	-0.0241*	0.0488*	-0.0261**	0.000816
	(0.0200)	(0.0107)	(0.0195)	(0.00942)	(0.0116)
Share of femals		1.088***		1.087***	1.093***
		(0.0480)		(0.0491)	(0.0493)
Share of skilled workers			0.0533*	0.0105	0.0342*
			(0.0246)	(0.0155)	(0.0172)
Log labor					-0.00979**
					(0.00374)
Log capital					-0.000429
					(0.000917)
2-digit ISIC FE	YES	YES	YES	YES	YES
Governorate FE	YES	YES	YES	YES	YES
N	7578	7578	7578	7578	7441

Standard errors in parentheses
$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 19: **Income Inequality**

	(OLS)	(Heckman Full ML)
dep.var: log wage ratio of skilled to total workers		
Export dummy	0.281***	0.298***
	(0.0367)	(0.0500)
Import dummy	0.0326^{+}	0.0339*
	(0.0176)	(0.0152)
Log labor	-0.212***	-0.221***
	(0.00939)	(0.0109)
Log capital	-0.00572	-0.00159
	(0.00369)	(0.00327)
Sector	-0.276***	-0.346***
	(0.0414)	(0.0484)
Age	0.000529	0.00120*
	(0.000415)	(0.000481)
Foreign workers dummy	0.239***	0.244**
	(0.0620)	(0.0856)
Selection Equation		
Age		0.00304
		(0.00238)
Registration license dummy		0.381***
		(0.0739)
Paid owner dummy		1.039***
		(0.233)
Regular accouting stat. dummy		-0.399^{+}
		(0.242)
Type of establishment dummy		0.654**
		(0.212)
Size Category		YES
Industry and governorate fixed effects are included in the main regressions		
N	7441	9218

Notes: Export dummy is set to one for exporters and zero otherwise. Import dummy equals one if a firm imports some (all) of its intermediate inputs. Foreign worker dummy equals one if a firm hires foreign workers and zero otherwise. Types of establishment dummy is set to one if a branch or headquarters and zero if a single entity. Sector dummy equals one if private and zero if public. Paid owner dummy is set to one if a firm has a paid employer and zero otherwise. The regular accounting statement dummy is equal to one if a firm issues regular financial statements and zero otherwise. The size categories are Small (workers ≤ 20), Medium ($20 <$ workers ≤ 50), Large ($50 <$workers ≤ 100), and Super Large (workers > 100). All categories are highly significant in the selection equation except for the Large category. The results are little changed if a continuous measure of size (log workers) is used in the selection equation. Probability weights are used in all regressions. The value of ρ in the Heckman regression is 0.82 and highly significant. Standard errors in parentheses: $^{+}(p \leq 0.05)$, * $(p \leq 0.05)$, $^{**}(p \leq 0.01)$, *** $(p \leq 0.001)$

Table 20: **Distribution of Only Exporters by industry**

2 digit level activities	**Exporters**					
	Exporting less than 90% of sales			**Exporting mor than 90% of sales**		
	No.	row %	Col %	No.	row %	Col %
Manufacture of food products	45	78	16	13	22	15
Manufacture of tobacco products	2	67	1	1	33	1
Manufacture of textiles	21	68	7	10	32	11
Manufacture of wearing apparel	22	40	8	33	60	38
Manufacture of leather and related products	4	67	1	2	33	2
Manufacture of paper and paper products	4	100	1	0	0	0
Printing and reproduction of recorded media	4	67	1	2	33	2
Manufacture of coke and refined petroleum products	1	100	0	0	0	0
Manufacture of chemicals and chemical products	31	84	11	6	16	7
Manufacture of basic pharmaceutical products..	14	78	5	4	22	5
Manufacture of rubber and plastics products	29	94	10	2	6	2
Manufacture of other non-metallic mineral products	22	81	8	5	19	6
Manufacture of basic metals	11	100	4	0	0	0
Manufacture of fabricated metal products..	20	87	7	3	13	3
Manufacture of computer, electronic and optical products	5	100	2	0	0	0
Manufacture of electrical equipment	21	100	7	0	0	0
Manufacture of machinery and equipment n.e.c.	10	100	4	0	0	0
Manufacture of motor vehicles, trailers and semi-trailers	1	50	0	1	50	1
Manufacture of furniture	4	80	1	1	20	1
Other manufacturing	13	76	5	4	24	5
Total	284	77	100	87	23	100

Figure 1: Lorenz Curve for Export and Aggregate Sales

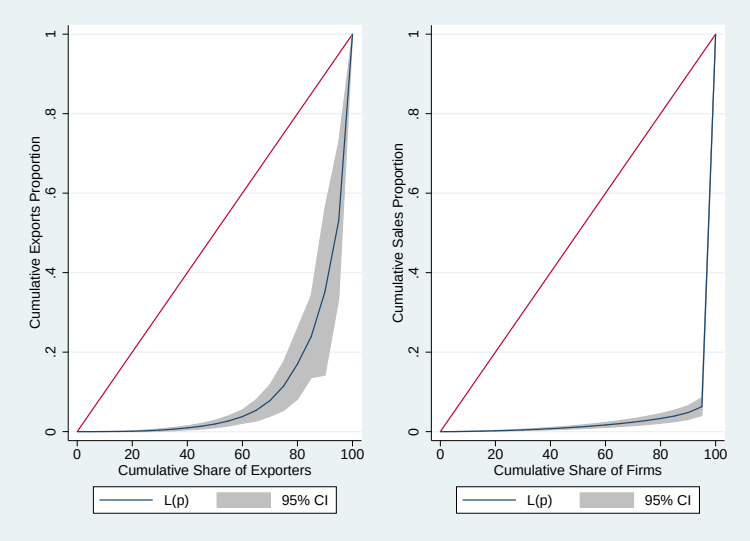
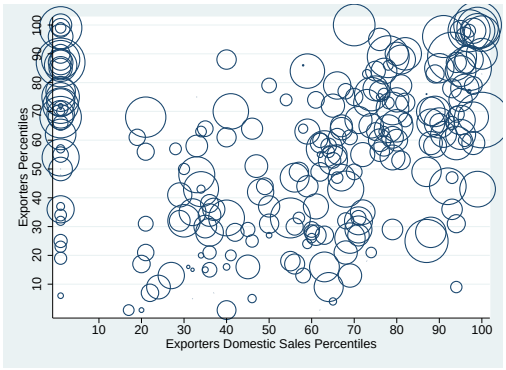
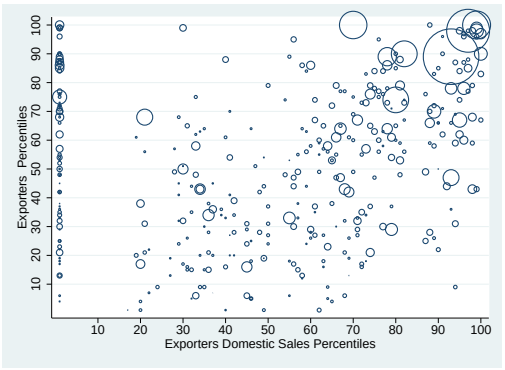


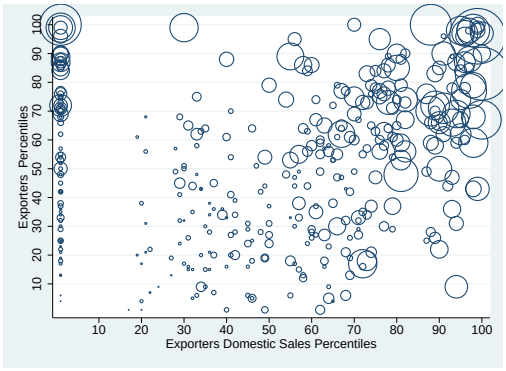
Figure 2: Domestic Sales and Export Sales



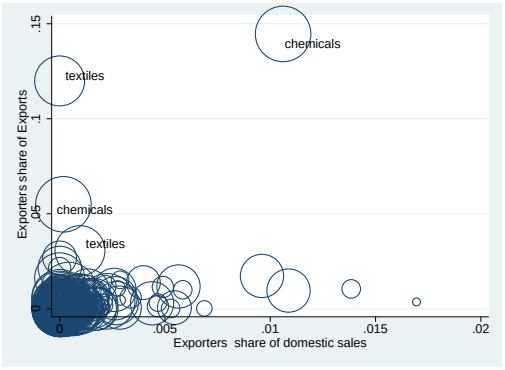
(a) The size of the bubbles reflects firm TFP



(b) The size of the bubbles reflects firm capital per worker



(c) The size of the bubbles reflects the number of workers



(d) The size of the bubbles reflects the sectoral total exports