Southeast Asian Journal of Economics Vol.12(2), August 2024: 125-160
Received: 26 September 2023
Revision: 22 November 2023
Accepted: 16 January 2024

Pure-Exporter Premiums

Wisarut Suwanprasert

Department of Economics and Finance, Jennings A. Jones College of Business, Middle Tennessee State University, Murfreesboro, Tennessee, USA.
Corresponding author: Wisarut.Suwanprasert@mtsu.edu.

Abstract

In this study, I explore the concept of the "pure-exporter premium" and estimate the differential characteristics of pure exporters—firms that sell at least 90 percent of their output to foreign markets—compared to general exporters. Using Thailand's firm-level census data for manufacturing firms, the empirical analysis uncovers positive pure-exporter premiums in terms of total output, value added, and export value, alongside more extensive use of both overall labor and labor in production and a greater reliance on imported materials. Conversely, the analysis finds negative pure-exporter premiums in terms of firm productivity, firm age, capital investment, the capital-to-labor ratio, and the employment of non-production labor. However, the investigation does not find evidence for statistically significant differences in the skill composition of labor, the use of intermediate inputs, wages, or the total labor compensation between the two groups of exporters.

***Keywords*:** pure exporters, pure exporter premium, export intensity

1. Introduction

The existing literature on international trade has extensively explored the differences between exporters and non-exporters, highlighting the "exporter premium"—the superior economic performance of exporters in various aspects such as productivity, employment, and wages. Seminal works such as Bernard et al. (2003) and Bernard et al. (2007) have been instrumental in outlining these differences. However, a noticeable gap in the literature remains regarding the heterogeneity within the exporter group itself. This gap is especially evident when comparing the diverse export intensities across different countries. For instance, while 95 percent of U.S. exporters derive less than half of their revenue from foreign markets, other countries see a significant proportion of their exporters primarily relying on international markets. This diversity in export intensity, as highlighted by Defever and Riaño (2022) in their analysis of 47 countries, suggests systematic distinctions between "pure exporters," which depend heavily on international markets, and "general exporters," which maintain a focus on domestic markets.

The literature is silent regarding the heterogeneity within the exporter cohort, particularly the distinction between pure and general exporters. Some studies, such as those by Gao and Tvede (2022), Lu (2010), and Lu et al. (2014), suggest that pure exporters are less productive than general exporters, while the findings from Mahakitsiri and Suwanprasert (2023) in Thailand show a similarity in firm productivity between pure and general exporters. This inconsistency in the literature underscores the need for a more nuanced examination of the pure-exporter phenomenon, particularly of aspects beyond firm productivity.

The main objective of this paper is to shed light on the concept of a pure-exporter premium in various firm characteristics. Building on the work of Mahakitsiri and Suwanprasert (2023) in the Thai context, I define a pure exporter as a firm whose export revenue constitutes over 90 percent of its total revenue. This definition aligns with those of Defever and Riano (2022) and Lu et al. (2014), who categorize pure exporters as firms exporting their entire output. By analyzing Thailand's industrial census data from 2007, 2012, and 2017, this paper seeks to quantify the pure-exporter premium across three key dimensions: firm outcomes (firm size, value added, export value, firm productivity, and age), input usage (capital, labor, materials), and labor attributes (skills and wages).

I estimate the pure-exporter premiums using a linear model with fixed effects. The first model specification uses only year fixed effects to quantify a broad measure of the pure-exporter premiums across diverse industries within the economy. Then, the second model specification uses industry-year fixed effects to remove industry-specific differences. The third model specification follows Bernard et al. (2003) and uses industry-year fixed effects and firm output. The idea is to use output to control for firm size, particularly in the context of input usage.

The empirical results reveal significant distinctions between pure and general exporters. Contrary to the common belief that pure exporters are typically small niche players in foreign markets, pure exporters actually often exhibit higher levels of output, value added, and export volume, indicating larger production scales and more profound engagement in international trade. In addition, pure exporters use labor more intensively in both overall and production-specific roles and rely more on imported materials. They demonstrate a reliance on labor over capital, evidenced by a lower capital-to-labor ratio.

In contrast, this study uncovers a negative premium in terms of firm productivity, age, capital usage, and the capital-to-labor ratio, with reduced employment in non-production roles. The empirical results do not find evidence for statistically significant differences in skill composition, intermediate input usage, average wages, and total labor compensation between pure and general exporters.

This paper is closely related to those by Gao and Tvede (2022), Lu et al. (2014), and Mahakitsiri and Suwanprasert (2023). Gao and Tvede (2022) and Lu et al. (2014) extend the Melitz (2003) model to rationalize the existence of pure exporters, but they have different assumptions regarding the fixed costs. Therefore, their theoretical models predict that pure exporters are less productive than general exporters but disagree on the productivity comparison between pure exporters and non-exporters. In contrast, Mahakitsiri and Suwanprasert (2023) do not find evidence that firm productivity affects Thai firms' decisions to become pure exporters. The existence of pure exporters has been examined in other studies such as Alfaro et al. (2023), Brooks (2006), Defever and Riano (2022), Lu (2010), and Mahakitsiri and Suwanprasert (2023). The contribution of this paper is to establish empirical evidence for the differences in firm characteristics (other than firm productivity) between pure exporters and general exporters.

There are a few recent studies that examine the characteristics of Thai exporters. Mahakitsiri and Suwanprasert (2023) use panel data to investigate factors influencing firms' decisions to become pure exporters. Jongwanich (2020) examines export diversification and margins on economic growth. Durongkaveroj (2023) studies the effect of global production networks on export performances. Nidhiprabha (2017) investigates the influence of foreign direct investment on

exports. Apaitan et al. (2019) use transaction-level customs data to establish stylized facts regarding Thai exporters. Apaitan et al. (2021) find that credit access allows Thai exporters to sell more varieties of goods, export to more destinations, and receive more revenue in each destination. This paper is the first to investigate pure exporter premiums.

The rest of the paper is organized as follows. Section 2 describes the data source and variable descriptions. Section 3 introduces the methodology. Section 4 provides empirical results. Section 5 concludes.

2. Data and Stylized Facts

2.1 Data Source and Variable Descriptions

In this study, I use extensive repeated cross-sectional firm-level data from Thailand, sourced from three rounds of Thailand's industrial census. These data rounds encompass a total of 73,931, 98,482, and 118,639 firm observations for the years 2007, 2012, and 2017, respectively. Consistent with the methodology employed by Mahakitsiri and Suwanprasert (2023), our classification of firms into 'pure exporters' and 'general exporters' is based on their export intensity; specifically, those exporting at least 90 percent of their output are categorized as pure exporters. The data have been meticulously cleaned following established procedures, with comprehensive details of this process provided in the appendix for reference.

The industry classification follows the International Standard Industrial Classification of All Economic Activities (ISIC), the international reference classification of productive activities. This study focuses on the manufacturing

sector, restricting the analysis to 23 industry groups as defined by the two-digit ISIC codes.

Output is quantified by annual product sales, while value added is calculated as the difference between sales and production costs, adjusted to zero in cases of a negative difference. Export values are represented by the annual export value of all products. Labor productivity is assessed both in terms of output per worker and value-added per worker. The age of firms is determined as of the survey year. The diversity of a firm's production is indicated by the number of distinct four-digit industry codes for output.

Capital is measured by the value of fixed assets at the start of each survey year. The capital utilization rate indicates how intensively capital assets are employed relative to their maximum capacity. This rate can exceed 100 percent if assets are used beyond their recommended daily operational hours. Labor variables encompass the total workforce, with a distinction made between those directly involved in production and those who are not. Skilled labor is defined as employees who have either undergone a minimum of three months of training or have at least five years of relevant work experience, while unskilled labor refers to those with less than two months of training.

The fraction of skilled labor in labor in production is the ratio of skilled labor in the labor in production. Labor not in production is the number of employees who are not involved with the production process. The capital-labor ratio is the ratio of capital to labor. Materials are the value of intermediate inputs used in production. The share of imported materials is the ratio of imported materials to the total materials. The unit of account is in terms of Thai Baht ($1=32-35 Baht).

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
log(output)	14,778	18.74	1.96	10.31	26.35
log(value-added)	14,778	18.61	1.95	10.10	26.35
log(export)	14,778	22.12	2.33	11.88	30.11
log(output per worker)	14,778	0.79	0.57	-2.39	4.54
log(value-added per worker)	14,778	0.97	0.81	-3.31	5.73
firm age (years)	14,778	17.87	11.08	1.00	99.00
the number of products	14,778	1.42	0.83	1.00	4.00
log(capital)	14,718	17.61	2.37	0.00	25.80
o capital utilization rate	14,778	79.47	17.94	1.00	155.00
Labor	14,778	303.26	690.27	1300	36,831.00
o labor in production	14,778	263.38	625.74	0.00	35,363.00
o skilled labor	14,778	165.57	401.76	0.00	13,143.00
o unskilled labor	14,778	97.81	405.04	0.00	27,314.00
o fraction of skilled labor	14,719	0.68	0.37	0.00	1.00
o labor not in production	14,778	39.58	137.08	0.00	7159.00
log(capital-labor ratio)	14,718	12.85	1.92	-8.57	22.00
log(materials)	14,778	15.96	2.49	0.00	24.55
o share of imported materials	14,778	25.19	30.88	0.00	100.00
log(average wage)	14,778	11.40	1.38	-17.34	14.44
o log(average wage of labor in production)	14,719	11.37	0.53	6.50	15.53
o log(average wage of labor not in production)	11,698	10.61	5.46	-17.34	15.83
log(average total compensation)	14,778	11.64	1.39	-17.34	14.52
o log(average TC of labor in production)	14,719	11.63	0.50	7.68	16.09
o log(average TC of labor not in production)	11,698	10.82	5.51	-17.34	16.13

Table 1 provides descriptive statistics of key variables used in this study. In the empirical analysis, the variables related to the amount of labor are in log form; however, Table 1 presents these variables in level for ease of interpretation.

2.2 Stylized Facts

Table 2 compares three types of manufacturing firms in Thailand: non-exporters, general exporters, and pure exporters. The total number of observations is 246,389. Non-exporters constitute the majority of the sample at 94 percent, while general exporters and pure exporters are 4.62 percent and 1.38 percent, respectively. General exporters and pure exporters have similar sizes, as measured by output and value added, and they are significantly larger than non-exporters.

Table 2: Descriptive Statistics by Export Status

Variables	Non-exporters	General Exporters	Pure Exporters
Number of observations	231,611	11,385	3,393
Share of total sample	94.00	4.62	1.38
log(output)	13.88	18.73	18.79
log(value-added)	13.79	18.59	18.66
log(export)	-NA-	21.75	23.36
log(output per worker)	0.07	0.79	0.79
log(value-added per worker)	0.06	0.96	1.00
firm age (years)	12.13	18.42	16.02
the number of products	1.18	1.44	1.36

Pure exporters are, on average, larger than general exporters. In terms of labor productivity, measured by output per worker and value-added per worker, pure exporters and general exporters seem to be similar and outperform non-exporters. Exporting firms tend to be older, with general exporters averaging 18.4 years and pure exporters 16.0 years, in contrast to the 12.1-year average for non-exporters. Finally, the number of products offered by firms shows a slight increase among exporters, with general exporters and pure exporters averaging 1.44 and 1.36 products, respectively, compared to 1.18 for non-exporters.

Overall, the data suggest an exporter premium in firm size and firm productivity, supporting the findings in the literature. A brief comparison between general exporters and pure exporters suggests that they are virtually similar.

3. Methodology

To compare pure exporters and general exporters, I use repeated cross-sectional data and exclude non-exporters. I define the pure-exporter dummy variable d^{PE}, which takes the value of 1 if the firm is a pure exporter and 0 if it is a general exporter. Then, I regress firms' characteristics with respect to the pure-export dummy and the set of control variables. The estimation takes the form:

$$y_{ist} = \beta^{y} d_{ist}^{PE} + \gamma_{st} + \varepsilon_{ist},$$

where subscript ist refers to firm i in industry s in year t, y ist is a characteristic of interest, β^{y} is the pure exporter premium on the characteristic y, γ_{st} is the set of control variables, and ε_{ist} is the error term.

In line with the methodology in Bernard et al. (2007), this study employs three sets of control variables for each firm characteristic. The first set contains only year fixed effects, so the coefficients represent a broad measure of the pure-exporter premium across diverse industries within the economy. The second set includes industry-year fixed effects to address industry-specific differences. The third set includes industry-year fixed effects and log(output) as controls. The variable log(output) captures the effect of firm sizes, particularly in the context of input usage.

The analysis categorizes firm characteristics into three distinct groups: (i) firm outcomes, (ii) input utilization, and (iii) labor attributes encompassing skills and wages. This classification mirrors the approaches adopted in Bernard et al. (2003) and Bernard et al. (2007). The first group focuses on fundamental firm metrics, commencing with firm size, quantified through output, value added, and export value. Subsequently, labor productivity is evaluated as a proxy of firm-level productivity. Additional variables in this group include firm age and the number of products. The second group focuses on input utilization. This begins with an analysis of capital and its utilization rate, followed by labor employment metrics. These elements are synthesized into a capital-labor ratio, reflective of the capital intensity inherent in the production of goods. The other variables in this group are intermediate materials and the share of imported materials.

The final group concentrates on labor attributes, distinguishing between labor in production and labor not in production, with a further subdivision of labor in production into skilled and unskilled categories. In addition, the proportion of skilled labor is considered. Complementing these metrics are analyses of wages and compensation, which are posited to correlate with both labor skill levels and productivity.

For the purpose of this analysis, variables where effects are interpreted as percentage changes are expressed in logarithmic terms.

Given the nature of the dataset as repeated cross-sectional firm-level data, the analytical framework is constrained in its capacity to encapsulate the dynamic evolution of individual firms. This limitation arises from the inherent structural differences between repeated cross-sectional data and panel data, the latter of

which offer a more robust mechanism for tracking the temporal progression and changes within firms.

4. Pure-Exporter Premiums

4.1 Pure-Exporter Premiums on General Firm Characteristics

In the first set of characteristics, I estimate pure-export premiums on output, value added, productivity (measured by output per labor and value-added per labor), export value, firm ages, and the number of products produced. The results are reported in Table 3 and summarized in Fact 1.

Table 3: Pure-Exporter Premiums on General Firm Characteristics

	Pure-Exporter Premiums		
	(1)	**(2)**	**(3)**
Firm size			
o log(output)	0.069	0.302**	
	-0.134	-0.125	
	[0.002]	[0.106]	
o log(value-added)	0.081	0.304**	0.003
	-0.133	-0.127	-0.005
	[0.003]	[0.104]	[0.992]
o log(export value)	1.624***	1.747***	1.440***
	-0.138	-0.109	-0.058
	[0.086]	[0.153]	[0.804]
Productivity			
o log(output per worker)	0.005	0.004	-0.054**
	-0.038	-0.034	-0.021
	[0.009]	[0.160]	[0.537]
o log(value-added per worker)	0.041	0.016	-0.066**
	-0.057	-0.053	-0.031
	[0.001]	[0.126]	[0.510]
Other characteristics			
o firm age (years)	-2.156***	-2.010***	-2.444***
	-0.397	-0.349	-0.261
	[0.044]	[0.069]	[0.127]

o number of products	-0.089*** -0.024 [0.026]	-0.075*** -0.02 [0.043]	-0.088*** -0.019 [0.052]
Additional control variables	Year FEs	Industry–Year FEs	Industry–Year FEs log (output)

Note: The coefficients are from bivariate ordinary least squares regressions of the firm characteristic in the first column on a dummy variable for whether the exporter was a pure exporter in that year. The regressions on Column 1 include time fixed effects, those on Column 2 include industry–time fixed effects, and those on Column 3 include industry–time fixed effects and log(output). All regressions have 14,778 observations. Standard errors in the parentheses are clustered at the industry level. *,**, and *** indicate significance levels of 0.10, 0.05, and 0.01, respectively. Adjusted R^2 are in square brackets.

Fact 1. *Pure exporters are larger, younger, and less productive than general exporters.*

First, as shown in Figure 1, pure exporters and general exporters appear to be comparable in terms of output and value added. However, when industry-year fixed effects are controlled for, pure exporters are typically 30.2 percent larger than general exporters. The export value of pure exporters is around 174.7 percent larger than that of general exporters, as illustrated in Figure 2. These two observations challenge the common misperception of pure exporters as exclusively small export-oriented firms; instead, they are substantial firms with significant export proportions.

Second, pure exporters and general exporters seem to be equally productive, as shown in Figure 3. In this exercise, productivity is proxied by output per worker and value-added per worker. The productivity proxies are normalized at the industry-year level. The estimated pure exporter premiums are small and are not statistically significant from zero. However, when controlled for firm size, the estimated pure-exporter premiums are negative. This is consistent with the model prediction of Gao and Tvede (2022) and Lu et al. (2014) and is comparable to an

empirical finding in Lu (2010) that high-export-intensity Chinese firms are less productive than Chinese firms that sell domestically.

Third, pure exporters are, on average, younger than general exporters. From Figure 4, the average age of pure exporters is 16.0 years, while the average age of general exporters is 18.4 years. The estimated pure-exporter premium ranges between -2.0 and -2.4 years across different model specifications. This could be indicative of a strategic orientation towards foreign markets in initial operational phases or a structural shift enabling newer firms to predominantly engage in pure exporting.

Last, the analysis reveals a marginally lower product diversity among pure exporters. While this difference is statistically significant, its economic implications appear minimal.

4.2 Pure-Exporter Premiums on Input Usages

In this section, the variables of interest are capital, labor, and materials. The results are shown in Table 4 and are summarized in Fact 2.

Table 4: Pure-Exporter Premiums on Input Usages

	Pure-Exporter Premiums		
	(1)	**(2)**	**(3)**
log(capital)	-0.167	0.115	-0.132**
	(0.142)	(0.104)	(0.063)
	[0.004]	[0.082]	[0.486]
o capital utilization rate	2.572***	2.495***	2.268***
	(0.665)	(0.628)	(0.624)
	[0.006]	[0.014]	[0.020]
log(labor)	0.284***	0.291***	0.118**
	(0.092)	(0.075)	(0.044)
	[0.012]	[0.068]	[0.651]
log(capital-labor ratio)	-0.453***	-0.179***	-0.252***

	(0.091)	(0.051)	(0.046)
	[0.025]	[0.094]	[0.148]
log(materials)	-0.067	0.247*	-0.074
	(0.135)	(0.136)	(0.048)
	[0.003]	[0.092]	[0.717]
o share of imported materials	11.589***	13.510***	12.822***
	(2.954)	(3.060)	(2.883)
	[0.025]	[0.132]	[0.151]
Additional control variables	Year FEs	Industry–Year FEs	Industry–Year FEs log (output)

Note: The coefficients are from bivariate ordinary least squares regressions of the firm characteristic in the first column on a dummy variable for whether the exporter was a pure exporter in that year. The regressions on Column 1 include time fixed effects, those on Column 2 include industry–time fixed effects, and those on Column 3 include industry–time fixed effects and log(output). All regressions have 14,778 observations. Standard errors in the parentheses are clustered at the industry level. *,**, and *** indicate significance levels of 0.10, 0.05, and 0.01, respectively. Adjusted R^2 are in square brackets.

Fact 2. *Pure exporters use more labor and less capital than general exporters do.*

First, pure exporters seem to use a similar amount of capital as general exporters do, according to Figure 5. The estimates in Columns (1) and (2) do not find statistically significant effects. However, after controlling for firm size, the estimate suggests that, on average, pure exporters use 13.2 percent less capital than general exporters with the same firm size. The pure-exporter premium on capital utilization rate is around 2.5 percentage points. From Figure 6, the average capital utilization rate of the pure exporters is 81.3 percent, and 25.2 percent of pure exporters fully utilize capacity, while the average capital utilization rate of the general exporters is 78.9 percent, and only 17.6 percent of general exporters use capital up to capacity.

Second, pure exporters use more labor than general exporters, according to Figure 7. When industry-year FEs are controlled for, pure exporters employ 29.1 percent more workers than general exporters. When taking firm size into account, the pure exporter premium falls to 11.8 percent. That is, on average, pure exporters

use 11.8 percent more labor than general exporters of similar size. Consistent with the negative pure-exporter premium on capital and the positive pure-exporter premium labor, in Figure 8 the capital-labor ratio of pure exporters is 25.2 percent smaller than that of general exporters.

Lastly, Figure 9 shows that pure exporters use 24.7 percent more materials than general exporters. However, the pure-exporter premium on materials disappears when firm size is considered. Therefore, the difference could be explained by the fact that pure exporters are often typically larger than general exporters.

The estimate finds a positive pure-exporter premium on imported materials. As illustrated in Figure 10, the average pure exporter imports 52.7 percent of its materials, while the average general export imports 37.5 percent of its materials. The pure-exporter premium is around 13.5 percent when only industry-year FEs are included and 12.8 percent when industry-year FEs and firm size are included.

4.3 Pure-Exporter Premiums on Skills, Wages, and Compensation

In this section, I estimate the pure-exporter premium on the composition of labor, average wages, and average total compensation. The results are shown in Table 5 and are summarized in Fact 3.

Table 5: Pure-Exporter Premiums on Input Usages

	Pure-Exporter Premiums		
	(1)	**(2)**	**(3)**
The Skill Composition			
○ log(labor in production)	0.366***	0.363***	0.171***
	(0.095)	(0.082)	(0.046)
	[0.009]	[0.051]	[0.501]
○ log(skilled labor)	0.284*	0.274**	0.079
	(0.143)	(0.121)	(0.072)

	[0.008]	[0.023]	[0.122]
o log(unskilled labor)	0.146	0.204	-0.036
	(0.336)	(0.208)	(0.234)
	[0.001]	[0.021]	[0.057]
o fraction of skilled labor	-0.002	-0.008	-0.003
	(0.018)	(0.012)	(0.013)
	[0.004]	[0.032]	[0.039]
o log(labor not in production)	-0.298*	-0.173	-0.366**
	(0.146)	(0.195)	(0.168)
	[0.036]	[0.042]	[0.082]
Wages			
log(average wage)	0.017	0.076	0.025
	(0.038)	(0.048)	(0.033)
	[0.013]	[0.026]	[0.078]
o log(average wage of labor in production)	-0.020	0.001	-0.014
	(0.020)	(0.016)	(0.014)
	[0.083]	[0.102]	[0.136]
o log(average wage of labor not in production)	0.329	0.682*	0.361
	(0.267)	(0.340)	(0.239)
	[0.001]	[0.025]	[0.180]
Total Compensation (TC)			
log(average TC)	0.004	0.083	0.020
	(0.042)	(0.055)	(0.037)
	[0.010]	[0.031]	[0.108]
o log(average TC of labor in production)	-0.037	0.008	-0.019
	(0.024)	(0.022)	(0.018)
	[0.071]	[0.125]	[0.240]
o log(average TC of labor not in production)	0.306	0.679*	0.347
	(0.271)	(0.346)	(0.243)
	[0.001]	[0.027]	[0.189]
Additional control variables	Year FEs	Industry–Year FEs	Industry–Year FEs log (output)

Note: The coefficients are from bivariate ordinary least squares regressions of the firm characteristic in the first column on a dummy variable for whether the exporter was a pure exporter in that year. The regressions on Column 1 include time fixed effects, those on Column 2 include industry–time fixed effects, and those on Column 3 include industry–time fixed effects and log(output). All regressions have 14,778 observations except the average wage and average TC of labor not in production, which has 11,698 observations. Standard errors in the parentheses are clustered at the industry level. *,**, and *** indicate significance levels of 0.10, 0.05, and 0.01, respectively. Adjusted R^2 are in square brackets.

Fact 3. *Pure exporters use more labor in production and less labor not in production than general exporters do. There is no pure-exporter premium on the skill composition, wages, and total labor compensation.*

The workers within firms can be segregated into two groups: those engaged in production activities and those assigned to non-production tasks. Figures 11 and 12 show the distributions of workers in production and workers not in production. Initially, before accounting for firm size, pure exporters exhibit a higher utilization of labor in production by approximately 36.3 percent compared to general exporters, while labor not in production of both pure and general exporters remains relatively similar. However, when firm size is controlled for, the pure-exporter premium on labor can be attributed to an increase of 17.1 percent in the number of workers engaged in production activities and a decrease of 36.6 percent in the number of workers in non-production roles.

Pure exporters demonstrate a 27.4 percent greater utilization of skilled labor than general exporters. However, once firm size is taken into account, both pure exporters and general exporters employ similar proportions of skilled and non-skilled labor. Figure 13 focuses on skilled workers, while Figure14 considers unskilled workers. Therefore, there is no pure-exporter premium on the ratio of skilled labor to labor in production.

Bernard et al. (2007) define skill per worker as labor not in production per total employment. If this analysis were to follow the definition in Bernard et al. (2007), then there is a negative pure-exporter premium on labor not in production per total employment, but there is no premium in skilled labor per labor in production.

Finally, the analysis of wages and total compensation reveals no statistically significant differences between pure exporters and general exporters. Thus, we can conclude that there is no pure-exporter premium in relation to wages and total

compensation. This outcome diverges from the established norm of an exporter wage premium observed in conventional comparisons between exporting and non-exporting entities.

5. Conclusion

This paper studies pure-exporter premiums, which are the differences between pure exporters and general exporters. Pure exporters are defined as exporters that export at least 90 percent of their output, and general exporters are the other exporters. The data are firm-level data from Thailand's industrial census in 2007, 2012, and 2017.

The empirical results find a positive pure-exporter premium on output, value added, shipments, overall labor usage, labor in production, and the share of imported materials and a negative pure-exporter premium on firm productivity, firm age, capital usage, the capital-to-labor ratio, and labor not in production. The analysis does not detect pure-exporter premiums on the skill composition, intermediate inputs, average wages, and average total labor compensation.

This paper sheds light on various future research directions. One direction is to investigate factors that cause pure-exporter premiums. Another possibility is that researchers may compare pure-exporter premiums across countries or regions to test the robustness of the findings in this paper.

Acknowledgements

This paper is based on my working paper, "Understanding the Bimodality of the Export Intensity Distribution in a Developing Country." I thank editor Vasileios Zikos and two anonymous referees for their comments and suggestions. I thank Joel Rodrigue, Archanun Kohpaiboon, Alejandro Rojas, and the seminar participants at Middle Tennessee State University, Thammasat University, Chulalongkorn University, the Bank of Thailand, the Thailand Development Research Institute, the American Economic Association 2021 Annual Meeting, the Southern Economics Association conference (2019), the Eastern Economic Association conference (2020), and the Western Economic Association conference (2021) for helpful comments and discussions. All remaining errors are mine.

References

Alfaro, Laura, Alejandro Cuñat, Harald Fadinger, and Yanping Liu. 2023. "The Real Exchange Rate, Innovation and Productivity." *Journal of the European Economic Association* 21(2), 637–689

Apaitan, Tosapol, Piti Disyatat, Krislert Samphantharak. 2019. "Dissecting Thailand's International Trade: Evidence from 88 Million Export and Import Entries." *Asian Development Review* 36(1), 20–53. https://doi.org/10.1162/adev_a_00122

Apaitan, Tosapol, Doungdao Mahakitsiri, and Krislert Samphanthara. 2021. "A Microscopic View to Unlocking Finance and Trade: Evidence from Thailand." *Southeast Asian Journal of Economics* 9(2), 39–72. https://so05.tci-thaijo.org/index.php/saje/article/view/253588

Bernard, Andrew, B., Jonathan Eaton, J. Bradford Jensen, and Samuel Kortum. 2003. "Plants and Productivity in International Trade." *American Economic Review* 93(4), 1268–1290.

Bernard, Andrew B., J. Bradford Jensen, Stephen J. Redding, and Peter K. Schott. 2007. "Firms in International Trade." *Journal of Economic Perspectives* 21(3), 105–130.

Brooks, Eileen. 2006. "Why Don't Firms Export More? Product Quality and Colombian Plants." *Journal of Development Economics* 80(1), 160–178.

Defever, Fabrice, and Alejandro Riaño. 2022. "The Twin Peaks of the Export Intensity Distribution." *Journal of the European Economic Association* 20(3), 1347–1394.

Durongkaveroj, Wannaphong. 2023. "Emphasis on Domestic Value Added in Export in the Era of Global Value Chain: Evidence from Thailand." *Journal of Industrial and Business Economics* 50, 703–729. https://doi.org/10.1007/s40812-022-00239-9

Gao, Bo, and Mich Tvede. 2022. "The Impact of Trade with Pure Exporters." *Review of International Economics* 30, 83–112. https://doi.org/10.1111/roie.12554.

Jongwanich, Juthathip. 2020. "Export Diversification, Margins and Economic Growth at Industrial Level: Evidence from Thailand." *The World Economy* 43, 2674–2722. https://doi.org/10.1111/twec.12921

Lu, Dan. 2010. "Exceptional Exporter Performance? Evidence from Chinese Manufacturing Firms." Manuscript, University of Chicago.

Lu, Jiangyong, Yi Lu, and Zhigang Tao. 2014. "Pure Exporter: Theory and Evidence from China." *The World Economy* 37, 1219–1236. https://doi.org/10.1111/twec.12108

Mahakitsiri, Doungdao, and Wisarut Suwanprasert. 2023. "Who are Pure Exporters?" *The World Economy* 46, 1759– 1787. https://doi.org/10.1111/twec.13351

Nidhiprabha, Bhanupong. 2017. "The Rise and Fall of Thailand's Export-Oriented Industries." *Asian Economic Papers* 16(3), 128–150. https://doi.org/10.1162/asep_a_00556

Appendix A: Data Cleaning Procedure

This section outlines the data cleaning procedure. Initially, the dataset encompassed a comprehensive collection of 246,390 observations, spanning the years 2007, 2012, and 2017. The specific procedures undertaken are outlined below:

- Selection of Manufacturing Firms: To focus exclusively on the manufacturing sector, the dataset was filtered to include only firms with a 2-digit industry code falling within the range of 15 to 37.
- Unique Identification Numbers: Firms lacking unique and non-missing identification numbers were excluded from the analysis.
- Completeness of Essential Firm Information: Firms with missing information for key variables were eliminated from the dataset.
- Minimum Output Threshold: Firms with an output smaller than zero were excluded from the dataset.
- Exporters: Firms received revenue from foreign countries in that year.

After applying this cleaning procedure, the data set contains 14,778 observations remaining for further analysis.

Appendix B: Figures

Figure 1: The distributions of log(output)

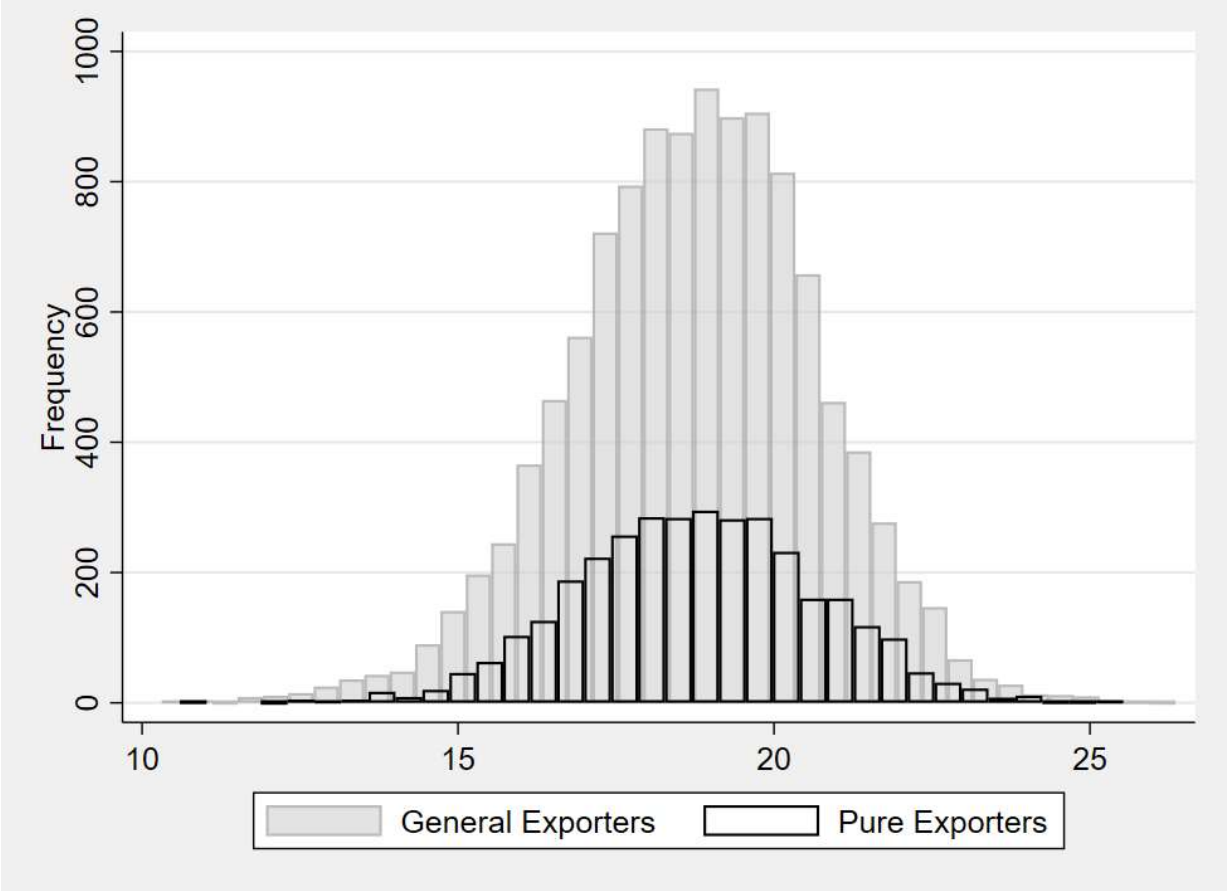

Figure 2: The distributions of log(shipments)

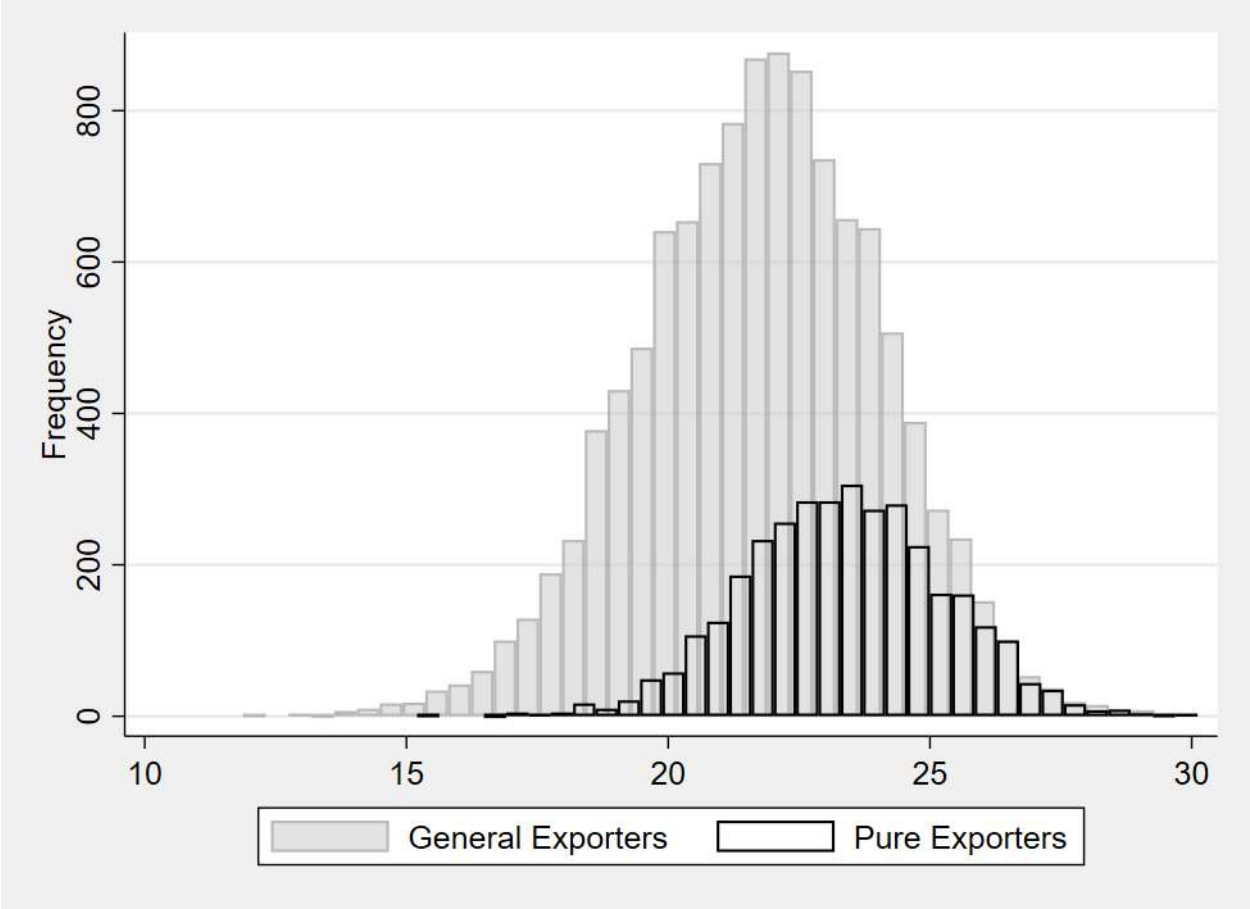

Figure 3: The distributions of firm productivity measured by log(output per worker)

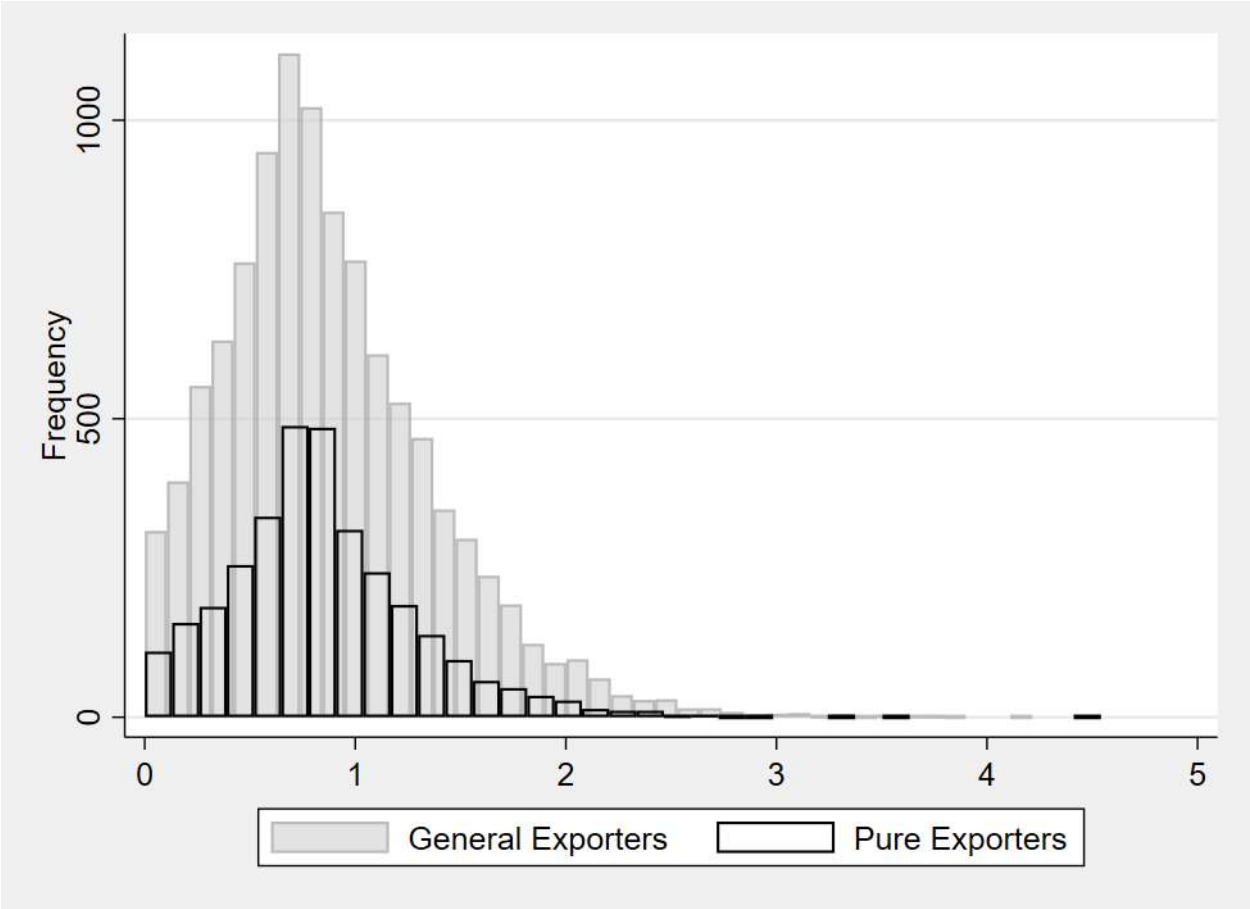

Figure 4: The distributions of firm age

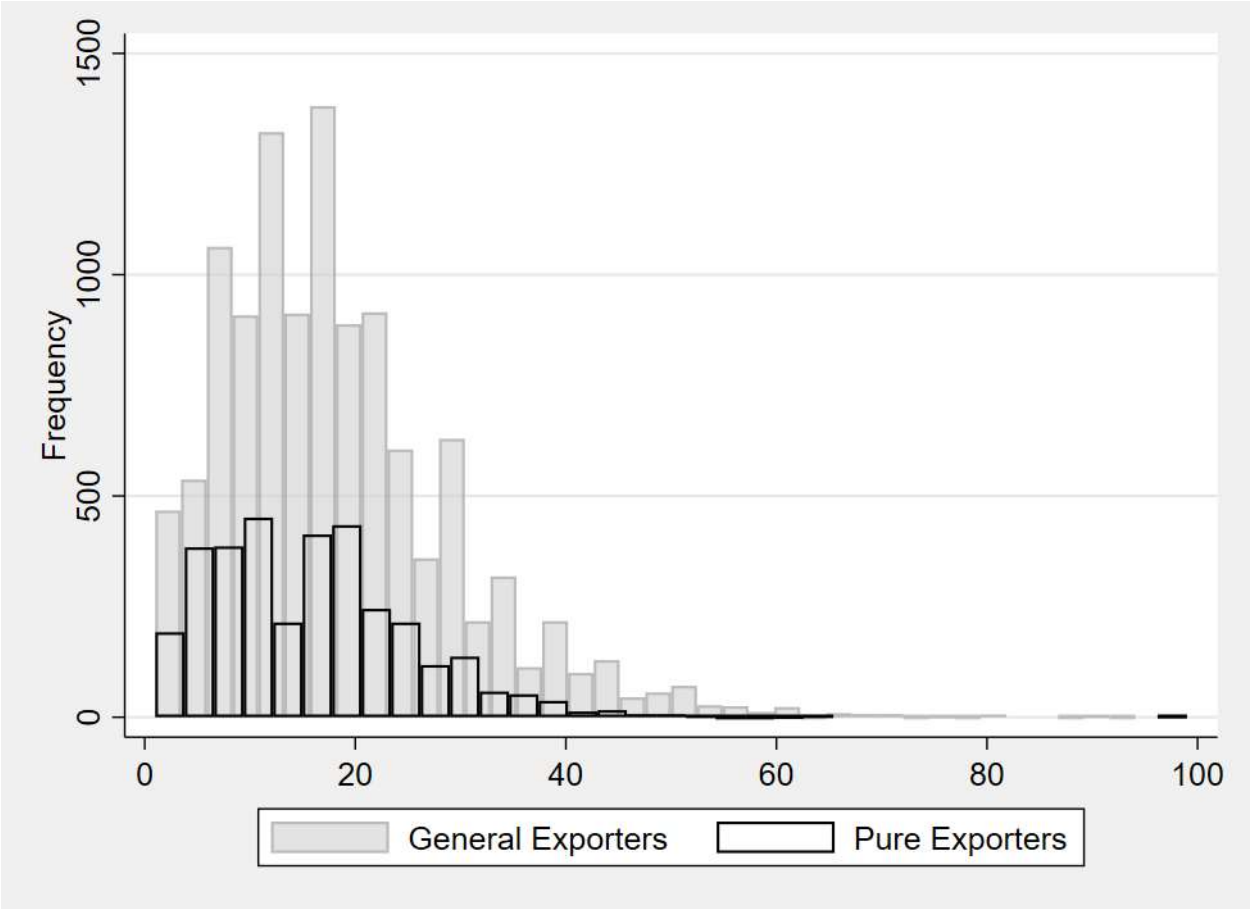

Figure 5: The distributions of log(capital)

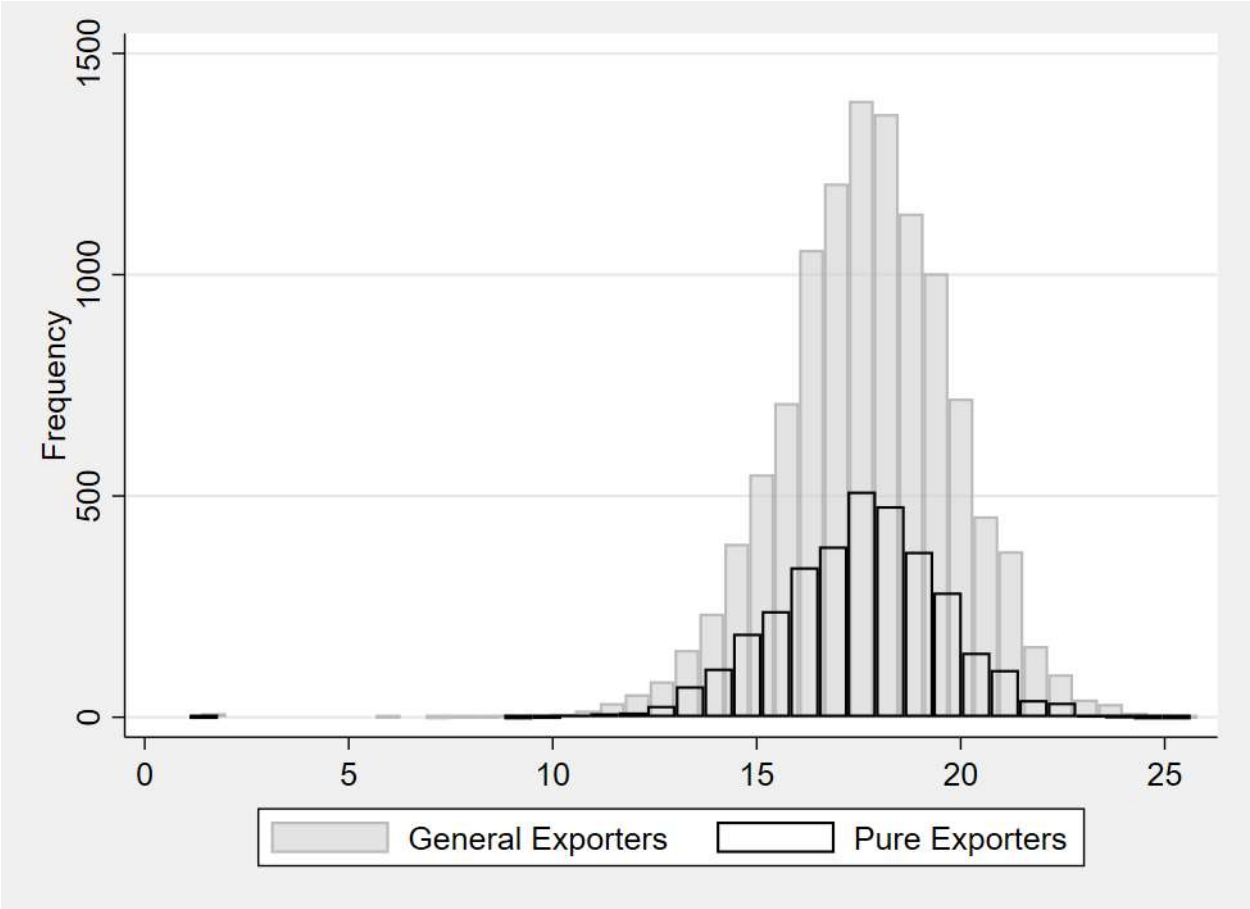

Figure 6: The distributions of capital utilization rate

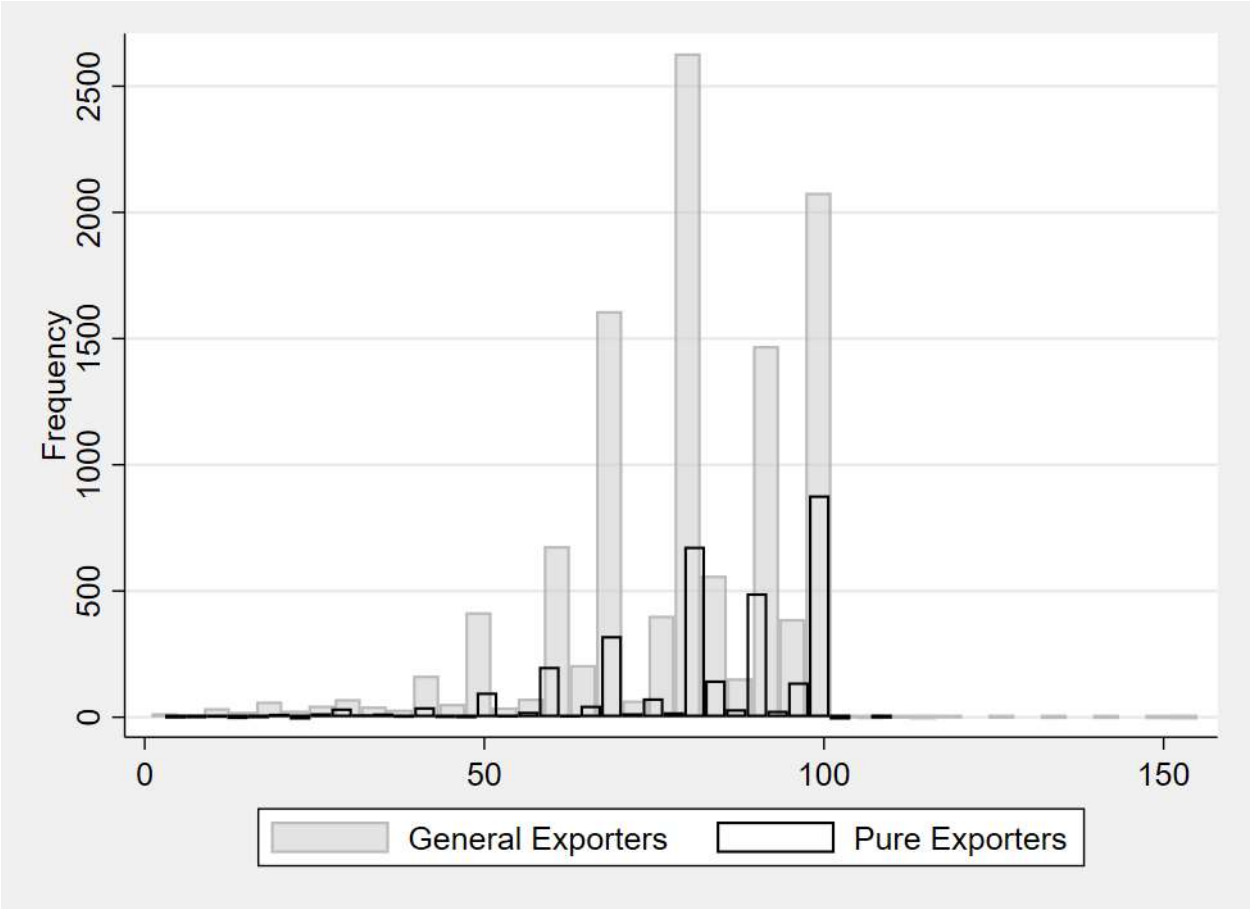

Figure 7: The distributions of log(workers)

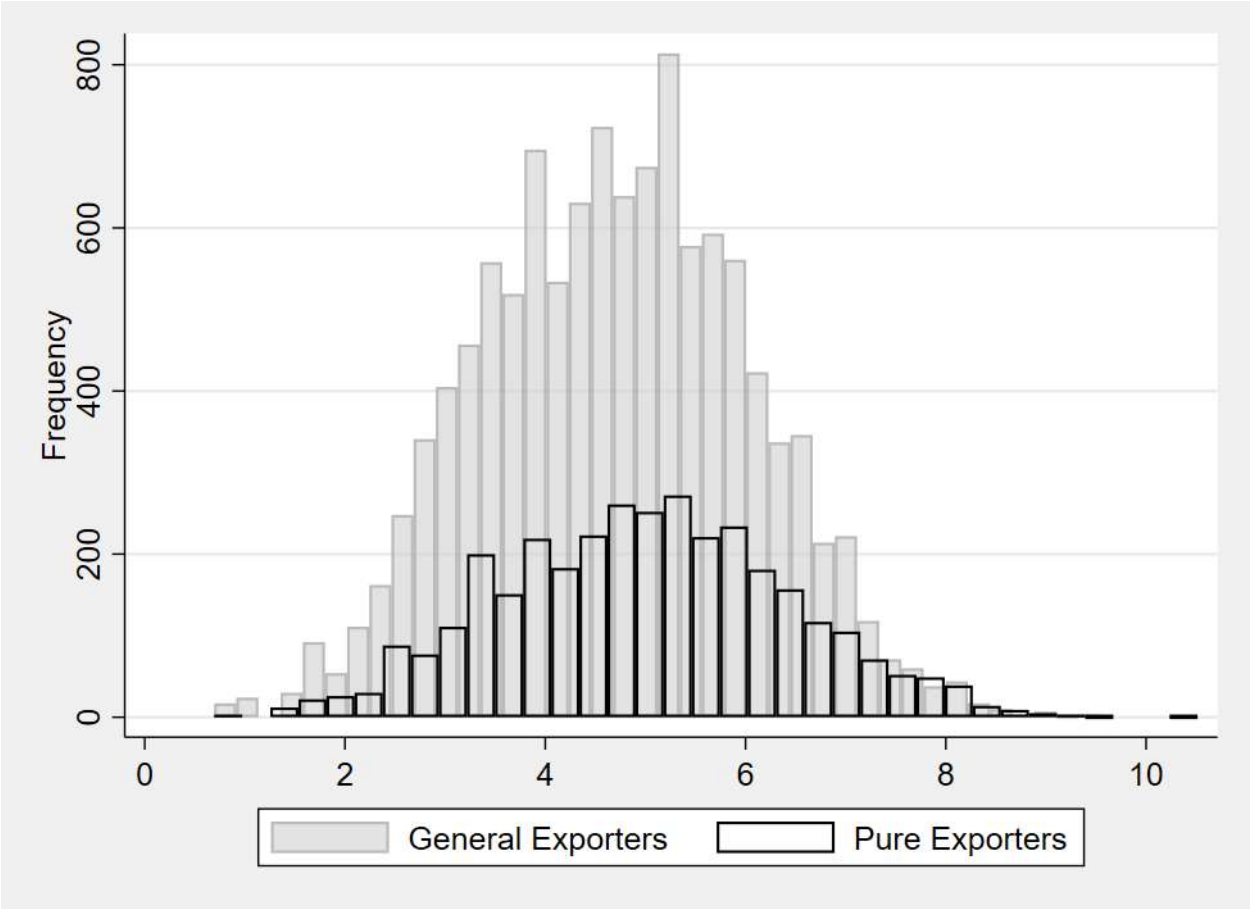

Figure 8: The distributions of log(capital-to-labor ratio)

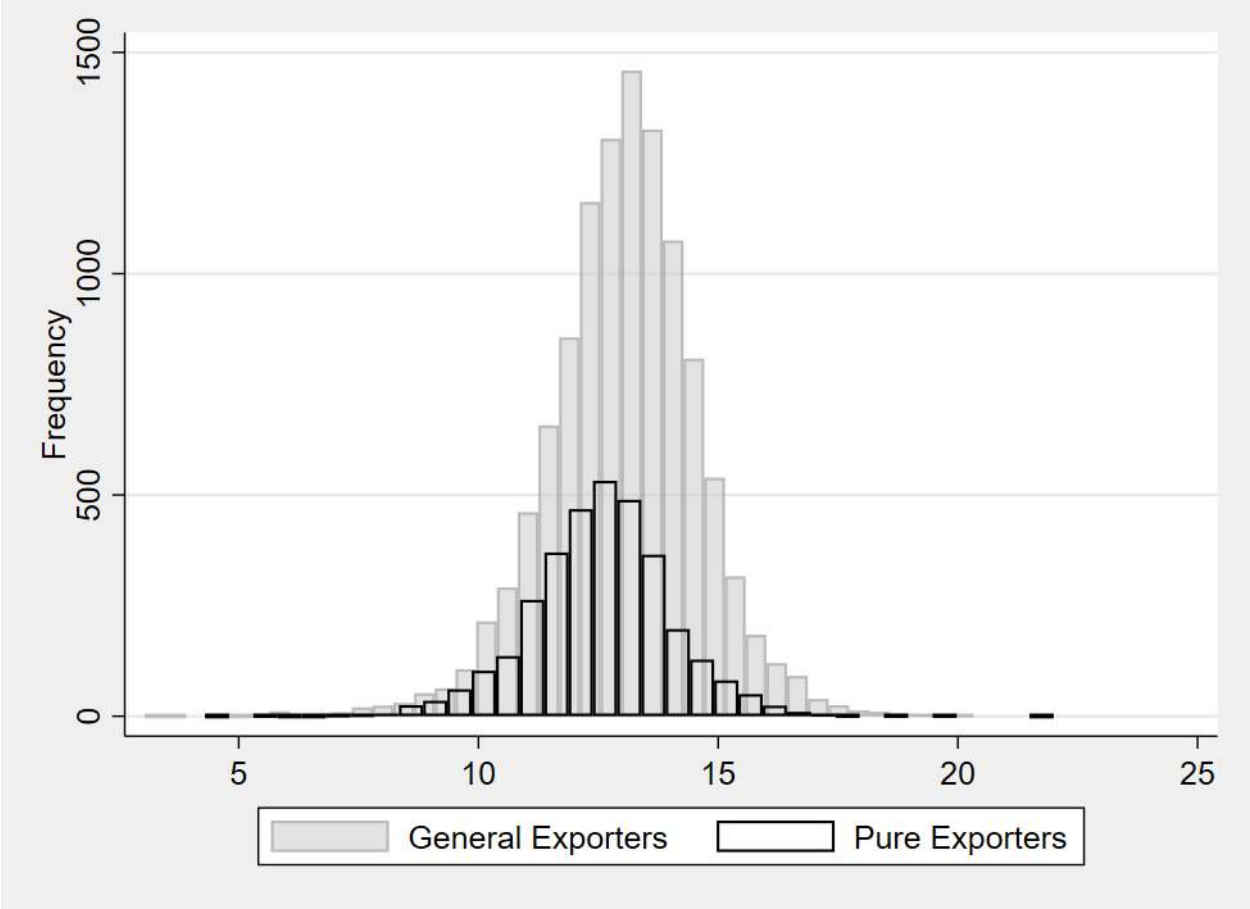

Figure 9: The distributions of log(materials)

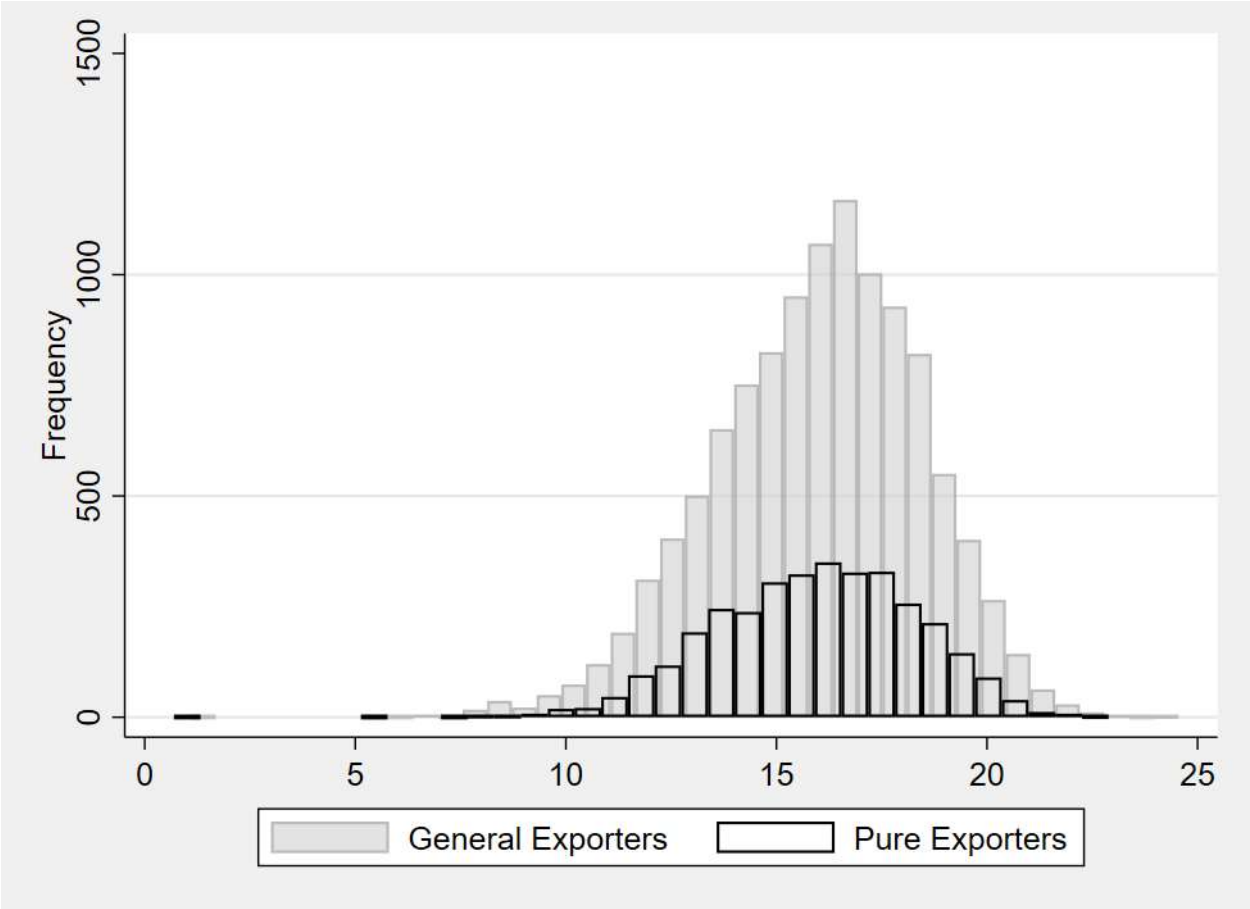

Figure 10: The distributions of the share of imported materials

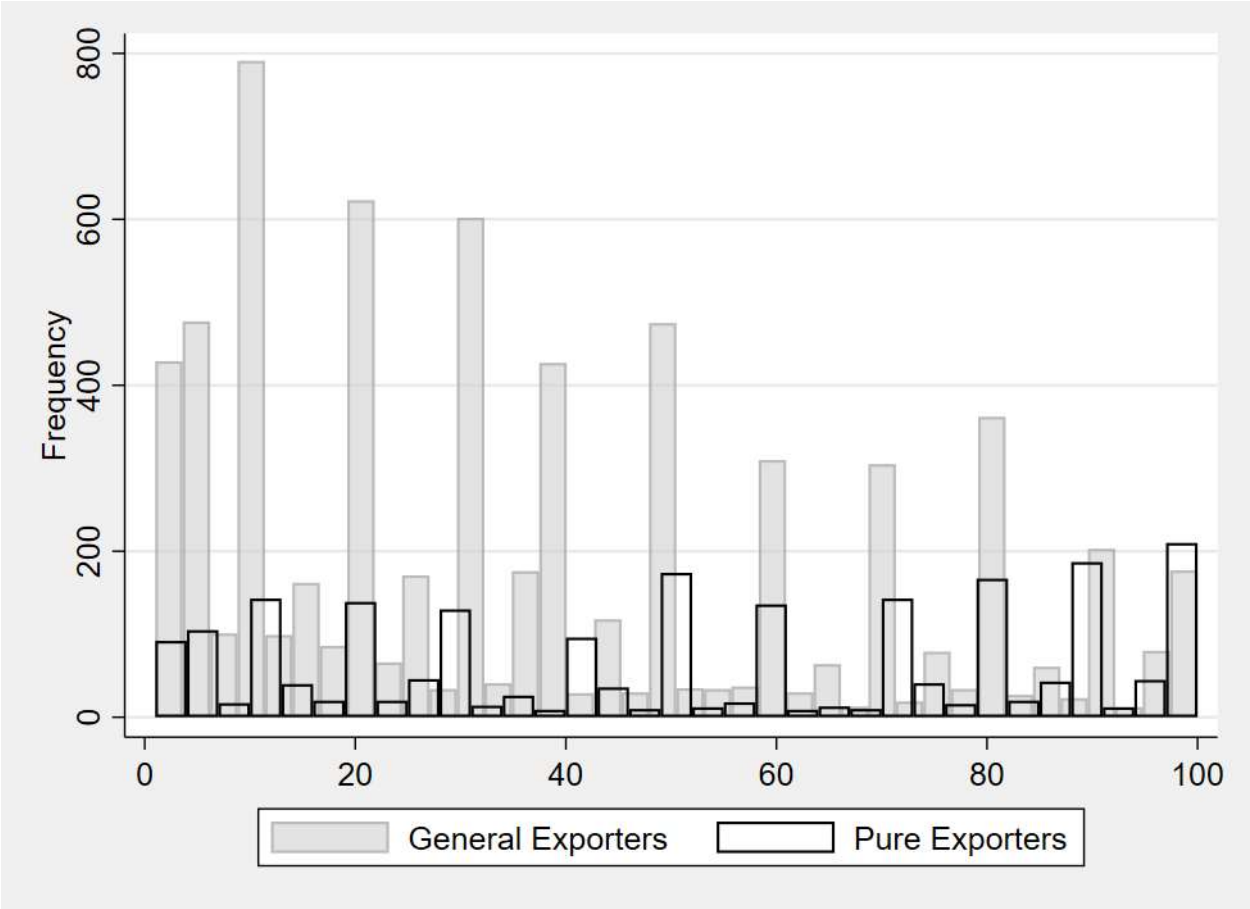

Figure 11: The distributions of log(workers in production)

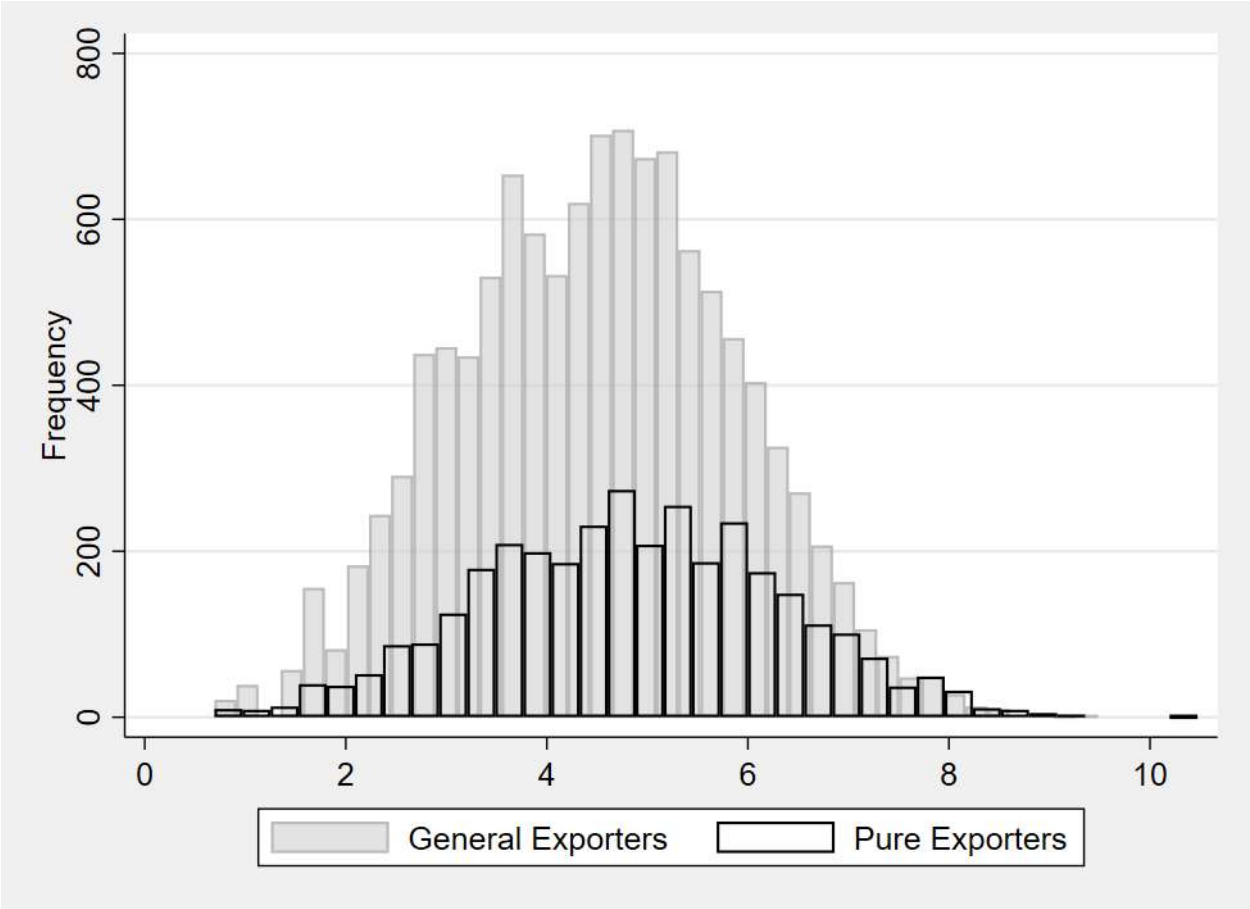

Figure 12: The distributions of log(workers not in production)

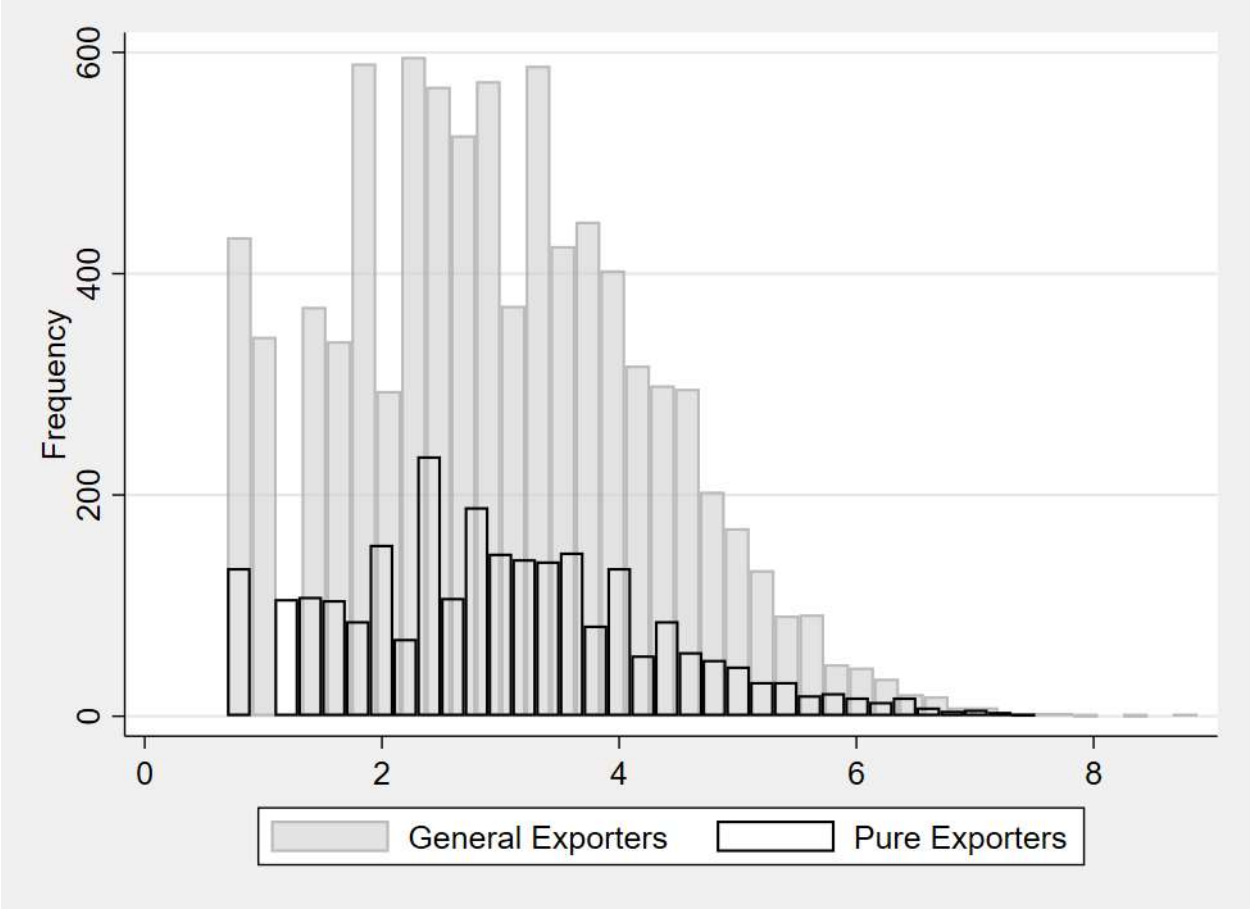

Figure 13: The distributions of log(skilled workers)

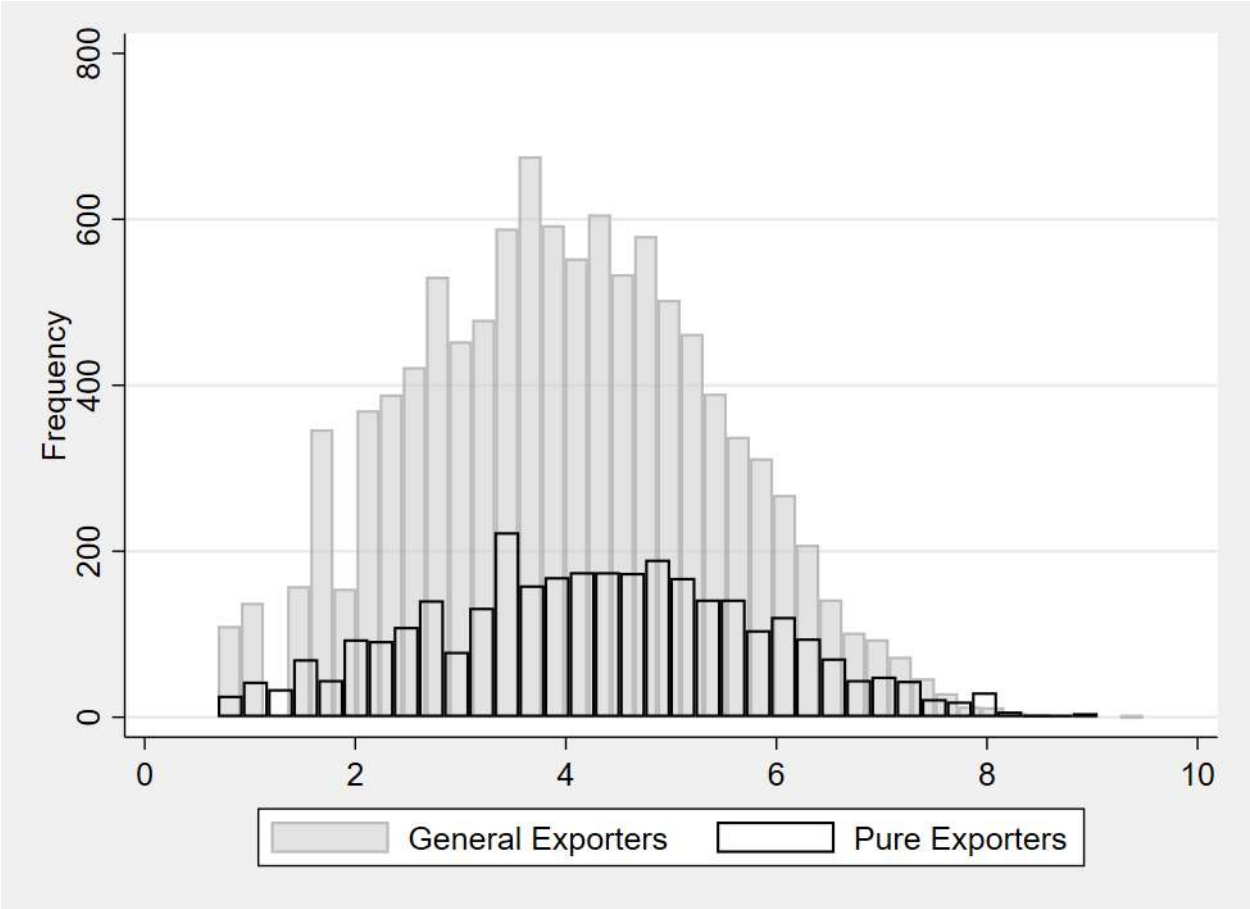

Figure 14: The distributions of log(unskilled workers)