

Exports and imports effect on performance - A study on Portuguese firms

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Abstract

Exports and imports, particularly in Portugal, have been on the rise, leading to a significant increase in commercial exchanges with various countries over the years. However, it should be noted that this growth does not necessarily imply that exports and imports are universally beneficial for firms, nor does it guarantee that companies engaged in such activities exhibit superior performance.

Furthermore, there is a scarcity of studies on the performance of companies in Portugal, with much of the existing research focusing on specific types of enterprises, often concentrating solely on larger corporations. Additionally, there is a lack of comprehensive studies that examine the various markets to which companies can export or import their goods and services. Therefore, to bridge this gap, the primary objective of this dissertation is to analyze the effect of exports and imports on Portuguese firms, determining which types of companies benefit the most from exporting or importing. The study also aims to evaluate companies based on their export and import markets. To achieve these objectives, the research will utilize the Sistema de Contas Integradas das empresas database and Quadros de Pessoal, employing econometric models using ordinary least squares and fixed effects methods, to the value of sales per employee and the growth rate of the firms as our performance measures. The ultimate goal is to ascertain which companies in Portugal demonstrate superior performance in this context. This study seems to demonstrate evidence that importing or exporting companies exhibit higher sales per employee and higher growth, encompassing all types of firms (services and products) and considering export and import markets (EU and non-EU).

Keywords: Exporters; Importers; Export Market; Import Market; Services; Goods; Firm Performance;

1. Introduction

In the literature, there is a substantial number of articles concerning firm performance, analyzing the characteristics of these companies, and establishing relationships between these characteristics and company performance. One of these frequently analyzed characteristics is whether companies are importers or exporters. However, these traits are typically only examined for certain types of companies, especially manufacturers, with few studies focusing on the imports and exports of service companies. Existing studies on imports and exports predominantly concentrate on larger-scale enterprises and utilize the ISIC as an identifier of company type (Service vs. Product).

The existence of studies on corporate performance is quite limited in Portugal. In addition to analyzing the impact of a company being an exporter or importer, it is also important to examine the impact of different export markets, particularly considering the EU market or the non-EU market.

This analysis becomes even more critical to consider when an increase in the level of company exports in Portugal is observed.

Therefore, the objective of this paper is to conduct a review of existing studies on the impact of exports, to characterize a general model of companies in Portugal, taking into account the data available in the Sistema de Contas Integradas das Empresas (SCIE) database, and to employ econometric models to demonstrate the effects of exports and imports, and the difference between the markets.

2. Literature Review

Although some authors consider the distinction between products and services to be challenging to make (Vargo and Lusch, 2004), it is possible to describe a service as "any act or performance that one party can offer to another, which is essentially intangible and does not result in the ownership of anything" (Kotler, 2000, p.200)

The characteristics of services are intangibility, inseparability (production and consumption happen simultaneously), variability, and perishability (Zeithaml et al., 2010). These characteristics make it more challenging to demonstrate the quality of services, requiring greater care to ensure that services are delivered with the same quality and characteristics. Additionally, services cannot be stored, thereby presenting a greater susceptibility to fluctuations in demand (Miles, 2008).

Services also entail closer contact with customers, often being more personalized than products, making it more difficult to change the type of services offered compared to a company that changes the products it offers. Additionally, services face greater challenges in terms of intellectual property protection due to relatively less legislation (Hipp and Grupp, 2005).

Many studies suggest a positive relationship between international diversification and firm performance. Delios and Beamish (1999) found that international diversification is positively related to firm performance for a set of Japanese manufacturing companies. Nachum (2004) also observed a positive relationship between international diversification and firm performance for a sample of companies from developing countries. However, this relationship is influenced by the geographic region.

According to Cassiman et al. (2010), it was found that for a group of Spanish manufacturers, this relationship of increased productivity in companies could be attributed to the innovation processes of the companies, particularly in terms of processes. It is this innovation that enables small non-exporting companies to start exporting. Moreover, they argue that exporting companies are more productive not as a consequence of their exporting activities, but rather due to their inherent productivity, which subsequently leads them to engage in exporting.

According to Bernard and Wagner (1997) and Bernard and Jensen (1999) there are two hypotheses that explain the higher productivity of exporting firms. One is the process of selection where companies that begin to export undergo due to the initial costs of the export process. The second theory is that exporting firms are more productive due to the role of "learning by exporting," as exposure to other markets and competitors can stimulate productivity enhancement and necessitate business improvements due to heightened competition.

Wagner (2007) attempted to verify these two theories and found that indeed exporters tend to be more productive. He also found that more productive firms self-select to enter the export market. However, he did not find evidence that the act of being an exporter leads to increased productiv-

ity. On the other hand, Girma et al. (2004) found that exporters are more productive and self-select themselves to export. Contrary to Wagner's findings, Girma et al. found evidence that the act of exporting can lead to an increase in productivity. hypothesized that this might be related to the context of the country. From the existing studies in the literature, a positive relationship between service company exports and firm performance is also observed.

Lööf (2010) found that one of the differences between service and product companies is that there is greater consistency in exporting firms in the case of manufacturers. That is, the percentage of service companies that export in one year and also export in the following year is lower than that percentage in product companies. Lööf also found that the export productivity premium is higher for service companies than for manufacturers. Similarly, Breinlich and Criscuolo (2011) found that service companies that are importers, exporters, or two-way traders exhibit higher levels of productivity compared to those that do not engage in any international trade. They also found that the export premium was higher for service companies than for product firms.

Regarding the market to which companies export, Bastos and Silva (2010) found that the most productive Portuguese companies are those that export to more markets and that export levels decrease with market distance. Wagner (2004) results indicate that among German companies, those with the highest performance were those selling their products to the non-EU market, followed by those selling to the EU market. The least productive were those selling their products only in the national market.

Regarding imports, Vogel and Wagner (2010) found a positive relationship between importing and company productivity. They also identified a pre-selection effect among companies that begin importing but they were unable to find evidence of a learning-by-importing effect. Furthermore, they discovered that two-way traders experience the greatest benefit, followed by companies that only export, while companies that solely import benefit the least from international trade.

For manufacturing firms in Italy, Serti et al. (2010) found that the coefficient related to exports significantly decreased when the importer variable was added. They also observed that the exporter coefficient was lower than the importer coefficient, thus concluding that the premium of international trade was highest for two-way traders, followed by import-only companies, and with the least benefit for companies that only export.

Analyzing the Portuguese context, Armando

et al. (2010), presented similar results to Serti et al. (2010), finding that two-way traders exhibit better performance, followed by importers, and finally, exporters. They also discovered that companies importing from European countries demonstrate higher productivity.

Regarding other factors that may affect firm performance, according to Agiomirgianakis et al. (2011), companies with a higher number of employees with higher education levels demonstrate more sales per employee, showing a greater tendency towards innovation and research activities. Psacharopoulos and Patrinos (2004) also found that companies with a higher percentage of employees with higher education exhibit better performance, demonstrating a greater ability to overcome obstacles and improved decision-making capabilities.

Regarding the size of companies, according to Dhawan (2001), smaller-sized companies exhibit higher productivity, but small businesses face a higher risk of failure. Diaz and Sanchez (2008) also found that small and medium-sized enterprises were more efficient than larger-sized companies. Concerning the age of companies, Coad et al. (2013) found that older companies tend to have higher productivity, greater profitability, and typically a larger size.

Differences in firm growth rates across regions in Portugal indicate the influence of local competition and labor characteristics. This regional disparity impacts the growth trajectories of firms, with some experiencing slower growth compared to others (Barbosa and Eiriz, 2011). While Portugal's productivity has faced a slowdown, diverging from the positive trend in many EU countries (Nunes et al., 2020), the link between firm size and productivity remains consistent, with larger firms displaying higher productivity levels (Martins, 2016).

3. Methodology

The data used in this paper is derived from two databases: the *Sistema de Contas Integradas das Empresas* (SCIE) and the *Quadros de Pessoal* (QP). The SCIE database provides financial data and other characteristics of the companies, while the QP database provides additional information about the companies, more related to their workforce.

The QP database provides observations at the employee level. Therefore, to merge these two databases, the variables were averaged by firm and by year and then merged with the SCIE database, resulting in one observation per firm per year.

To analyze the effect of exports and imports, a multiple regression model will be used. This model

allows for the examination of the impact of one variable while considering the effects of other variables. Such models are particularly useful when working with non-experimental data. The model is expressed as follows according to the equation:

$$y = \beta_0 + \beta_1x_1 + \dots + \beta_kx_k + u \quad (1)$$

where y is the dependent or explained variable, x_k are the independent or explanatory variable, β_0 corresponds to the parameter associated with x_k and u represents the error term. The ordinary least squares (OLS) method was used to estimate these parameters.

Another method used was the fixed effects, this method is a useful technique for managing unobserved effects in panel data. In this method, the model accounts for a single independent variable for each firm, incorporating an unobserved effect term. By computing averages over time for each company, the analysis can be simplified.

When the unobserved effect is eliminated, the model can utilize pooled ordinary least squares (OLS) regression, following standard OLS assumptions. However, this approach has a drawback: it excludes time-constant variables, preventing the inclusion of characteristics representing firms' unchanging attributes.

Variables

The information in the SCIE and QP databases allows us to define a set of variables that characterize a company (Table 2).

Table 1: Explanatory variables used in the regression models

Variable	Type
Firm Type	Categorical – 5 dummies
Exporter	Categorical – Binary
Importer	Categorical – Binary
Export Market	Categorical – 6 dummies
Import Market	Categorical – 6 dummies
Firm Size	Categorical – 3 dummies
Age Log	Continuous
Employees Education	Categorical – 4 dummies

The variable "firm type" aims to identify the primary focus of the company, whether it is products, services, or both.

A company is classified as an exporter if it meets at least one of the criteria defined by the Bank of Portugal:

1. At least 50% of annual turnover is from exports of goods and services.
2. At least 10% of annual turnover due to exports and its value overpasses 150,000€.

Table 2: Explanatory variables used in the regression models

Firm Type	Conditions
0	0% of the turnover in product sales
1	Between 1% and 20% of the turnover in product sales
2	Between 21% and 79% of the turnover in product sales
3	Between 80% and 99% of the turnover in product sales
4	100% of the turnover in product sales

To be considered an importer, a company must meet at least one of the following criteria:

1. At least 50% of annual purchasing and services supply is from an outside market.
2. At least 10% of annual purchasing and services supplying services is from an outside market. and its value surpasses 150,000€.

These criteria ensure that a company is classified as an exporter only if it demonstrates a significant percentage of its business volume in exports or if the value of the exports is considerable.

To classify the markets to which a company exports, the variable "export market" was defined, as presented in Table 3.

Table 3: Classification of Export Market

Export Market	Conditions
0	Firm is not an exporter
1	100% of the exports is from the non- EU market
2	70% - 99% of the exports is from the non-EU market
3	31% - 69% of the exports is from the non-EU market
4	1% - 30% of the exports is from the non-EU market
5	0% of the exports is from the non-EU market

Regarding the import market, a similar procedure was followed, resulting in the following classification in table 4:

Regarding the size of the companies, they were classified into three types: Micro if they have fewer than 10 employees and a turnover of less than 2 million euros, Small if they have between 11 and 50 employees and a turnover of less than 10 million, and Medium and Big firms if they have more than 51 employees and more than 10 million in turnover.

Another variable included in the model is the education level of the employees. This variable takes the value of 0 if none of the employees have university studies, 1 if between 1 and 30% have university studies, 2 if between 31 and 70%, and 3

Table 4: Classification of Import Market

Import Market	Conditions
0	Firm is not an importer
1	100% of the imports is from the non- EU market
2	70% - 99% of the imports is from the non-EU market
3	31% - 69% of the imports is from the non-EU market
4	1% - 30% of the imports is from the non-EU market
5	0% of the imports is from the non-EU market

if more than 71% of the employees have a higher education degree.

Other variables included are the logarithm of the company's age, the CAE (equivalent to the International Standard of Industry Classification - ISIC) categorized into letters, and the region where the company is located.

Regarding the dependent variables, the variable considered was sales per employee, obtained by dividing the company's turnover by the number of employees and index growth composed of the business volume in year t divided by the business volume in year t-1.

To obtain a more meaningful representation, the logarithm of this index was considered. By applying the logarithm, the values of companies undergoing decline become negative and assume absolute values similar to companies experiencing growth in the same proportion. This adjustment rectifies the issue previously encountered, allowing for a more accurate representation of the company's growth dynamics

Descriptive statistics

Analyzing the data in the database, it can be observed that 79% of the companies are classified as micro-enterprises, 17% as small enterprises, and only 4% as medium or large enterprises. The turnover of micro-enterprises represents only 12%, while small enterprises represent 18%, and medium and big enterprises account for 70% of the total turnover of firms in Portugal.

Regarding the distribution of company types, the percentage of type 0 companies is 42%, type 1 is 10%, type 2 is 11%, type 3 is 16%, and type 4 is 21%. Companies of type 0 are only responsible for 18% of the total turnover of companies in Portugal, while type 1 companies are responsible for 10%, type 2 companies for only 5%, type 3 companies for 48%, and type 4 companies for 19%. Type 3 companies have the lowest percentage of micro firms, with only 65%, followed by type 1 with

72%, and the remaining types with values close to 82/83%.

Regarding exporters, approximately 8% of the companies are considered importers, and around 19% of the company turnover is from exports. Type 3 companies have the highest percentage of exporters (in relation to the number of companies of that type), at about 14%, while the remaining types have an average of 6% exporters. There is also a significant difference in the percentage of exporters between companies of different sizes: medium/big companies have around 38.5% of exporters, small companies have 18.1%, and micro companies have about 4.6%.

Furthermore, 44% of exporting companies only export to the EU market and 12.8% exclusively to the non-EU market. Additionally, 10.3% export to the market type 2, 9.8% to market type 3, and 22.9% to market type 4. Approximately 72% of the value of imports is from the EU market.

Type 0 companies have a higher percentage of exporters who only export to the EU market, and this percentage decreases as the percentage of product sales increases.

In terms of size, companies tend to export to only one market (EU or non-EU). Approximately 76% of micro exporters only export to one market (EU or non-EU), while this value is 25% for larger companies.

In terms of imports, 7% of the companies are importers, responsible for importing approximately 19% of the total products and services purchased by the companies. Type 1 companies have the highest percentage of importers, at about 27%, followed by type 4 with 23%. However, the companies with the highest percentage of imports in relation to their purchases are type 3 companies, at 18.8%, followed by type 4 at 10.5%, while type 1 represents only 3%. Similar to exports, medium and big companies have the highest percentage of importers, with approximately 40.9% of these companies being importers. For small companies, about 15.4% are importers, while for micro companies, only 3.8% are importers.

In terms of imports according to the market, 53.1% of companies import only from the EU market, while only 1.9% import solely from the non-EU market. About 6.2% import from market type 2, 8.6% from market type 3, and 30.2% from market type 4.

There is not a significant difference between the type of company and the market from which they import. However, despite micro firms showing the highest percentage of importers who import solely from the non-EU market, the majority of these companies (66%) only import from the EU market. Larger companies have a higher number of

importers who import from both markets.

Regarding our dependent variable, medium/big companies have the highest sales per employee value, with a value exceeding 683,000 euros. This value is approximately 10 times higher than that of micro companies and about 5 times higher than that of small companies.

Taking into account the type of company, type 0 and 1 companies present relatively similar values, between 54,000 and 57,000 euros. Type 2 companies show a value of approximately 87,000 euros, while type 3 companies have the highest value, around 207,000 euros. Type 4 companies have a value of about 128,000 euros.

Non-exporting companies have a value of around 90,000 euros, while exporters have around 203,000 euros. Companies that export to market type 2 have the highest value, while those exporting to market type 5 have the lowest value.

Regarding imports, importers have approximately 293,000 euros in sales per employee, while non-importers have around 84,000 euros. The companies with the highest value are those that import from market type 2, with a value of around 573,000 euros.

4. Results & discussion

The models were built using Stata software, and the robust option was added to account for the possible heteroskedasticity present in our models. Due to the highly skewed distribution of sales per employee the dependent variable used in the models is the logarithm of sales per employee. This facilitates a more straightforward interpretation of the coefficients and the estimates become less vulnerable to the impact of extreme values or outliers.

Since the dependent variable is the logarithm, it is necessary to apply the $100(e^{\beta} - 1)$ transformation to obtain the percentage of variation of our dependent variable considering the coefficient of our explanatory variable. All models include control variables for company size, labor qualifications, sector, and region.

Analyzing model 1, table 5, it can be seen that type 0 companies have, on average, the lowest value of sales per employee. Type 1 companies, *ceteris paribus*, have a sales per employee value that is 18% ($100(e^{0.164} - 1)$) higher than type 0. Type 3 companies have the highest value, presenting approximately 144% more than type 0 companies.

Regarding international trade, on average, an exporting company has a sales per employee value approximately 36% higher than a non-exporting company. Importing companies, on average, have a value that is approximately 70% higher than companies that do not import.

Table 5: Logarithm of sales per employee regressions using OLS

	Model 1	Model 2	Model 3
Firm Type 1	0.164*** (0.002)	0.163*** (0.002)	0.163*** (0.002)
Firm Type 2	0.309*** (0.002)	0.31*** (0.002)	0.307*** (0.002)
Firm Type 3	0.894*** (0.002)	0.894*** (0.002)	0.893*** (0.002)
Firm Type 4	0.608*** (0.003)	0.608*** (0.003)	0.608*** (0.003)
Exporter	0.309*** (0.003)	0.377*** (0.003)	
Importer	0.532*** (0.003)	0.609*** (0.003)	
Exporter X Importer		-0.26*** (0.006)	
Small firm	0.259*** (0.002)	0.256*** (0.002)	0.259*** (0.002)
Medium/Big firm	0.535*** (0.005)	0.548*** (0.005)	0.538*** (0.005)
Log Age	0.018*** (0.001)	0.018*** (0.001)	0.018*** (0.001)
Employees Education 1	0.063*** (0.002)	0.062*** (0.002)	0.064*** (0.002)
Employees Education 2	0.199*** (0.002)	0.198*** (0.002)	0.197*** (0.002)
Employees Education 3	0.254*** (0.003)	0.252*** (0.003)	0.251*** (0.003)
Export Market 1			0.409*** (0.008)
Export Market 2			0.458*** (0.007)
Export Market 3			0.346*** (0.008)
Export Market 4			0.25*** (0.005)
Export Market 5			0.261*** (0.004)
Import Market 1			0.437*** (0.024)
Import Market 2			0.732*** (0.011)
Import Market 3			0.59*** (0.008)
Import Market 4			0.494*** (0.004)
Import Market 5			0.526*** (0.003)
Constant	11.762*** (0.385)	11.732*** (0.382)	11.767*** (0.385)
Observations	2210718	2210718	2210718
R-squared	0.279	0.280	0.279
F-stat	18506.505	18189.555	15974.007
Adj R2	.279	.28	.279

Robust standard errors are in parentheses. *** p<.01, ** p<.05, * p<.1 The dependent variable is sales per employee in logarithm. Data from 2010 to 2020. Control Variables include: Year, Region, CAE, Firm size, Employees education, Age and Firm Type. The base level of each interaction and categorical variable was omitted

Analyzing model 2, which results from model 1 by adding the interaction between the "exporter" and "importer" variables, the coefficients of "exporter" and "importer" have increased. A company that is solely an exporter has a sales per employee value 46% higher than a non-exporting company, a company that is solely an importer has a value 84% higher than a non-importing company, and a company that is both an importer and an exporter has

a sales per employee value approximately 107% higher than a company that does not engage in international trade.

Model 3 allows to analyze companies considering the market to which they export and from which they import. We find that companies benefiting the most from being exporters are those that export predominantly, but not exclusively, to the non-EU market. These companies have, on average, a sales per employee value approximately 51% higher than companies that do not export.

Companies that export only to the non-EU market have a value approximately 5% lower than those exporting to market type 1, but still have a value about 51% higher than companies that do not export. Thus, the companies that benefit the most from being exporters are those exporting to market type 2, followed by those exporting to market type 3, and then those exporting to market type 4, with similar values for those exporting to market type 4 or 5.

In terms of imports, the companies that benefit the most from being importers are those that import predominantly from market type 2, with a sales per employee value approximately 108% higher than non-importing companies. The companies that benefit the least from being importers are those importing from market type 1, with a sales per employee value approximately 34% lower than those importing from market type 2, but still 55% higher than companies that do not import. In models 1, 2, and 3, all coefficients were significant, allowing the rejection of the null hypothesis and ensuring that the effect of the variables under analysis is different from zero.

It is also possible to analyze companies considering their type and whether they are importers or exporters. For this, in model 4 in table 6, the "exporter" and "importer" variables interacted with the "firm type" variable. Companies that benefit the most from being exporters are type 0 companies. However, the coefficient of the interaction between the firm type variable and the exporter variable is not significant. Exporting type 1 companies have a sales per employee value approximately 15% lower than type 0 exporting companies. Type 2 companies have a value approximately 7% lower than type 0 exporting companies. The companies that benefit the least from being exporters are type 3 companies, which have a value approximately 26% lower than type 0 exporting companies.

In terms of imports, all coefficients are significant, and companies that benefit the most from importing are type 0 companies, which have, on average, a value approximately 101% higher than non-importing companies.

Compared to type 0 exporting companies, type

Table 6: Logarithm of sales per employee regressions using OLS

	Model 4
Firm Type 1	0.174*** (0.002)
Firm Type 2	0.314*** (0.002)
Firm Type 3	0.945*** (0.003)
Firm Type 4	0.604*** (0.003)
Exporter	0.376*** (0.005)
Importer	0.699*** (0.008)
Small firm	0.257*** (0.002)
Medium/Big firm	0.548*** (0.005)
Log Age	0.019*** (0.001)
Employees Education 1	0.067*** (0.002)
Employees Education 2	0.200*** (0.002)
Employees Education 3	0.252*** (0.003)
Firm Type 1 X Exporter	-0.132*** (0.009)
Firm Type 2 X Exporter	-0.036*** (0.009)
Firm Type 3 X Exporter	-0.222*** (0.007)
Firm Type 4 X Exporter	0.003 (0.008)
Firm Type 1 X Importer	-0.163*** (0.014)
Firm Type 2 X Importer	-0.171*** (0.011)
Firm Type 3 X Importer	-0.283*** (0.009)
Firm Type 4 X Importer	-0.089*** (0.009)
Constant	110.706*** (0.377)
Observations	2210718
R-squared	0.280
F-stat	16051.884
Adj R2	.280

Robust standard errors are in parentheses. *** p<.01, ** p<.05, * p<.1 The dependent variable is sales per employee in logarithm. Data from 2010 to 2020. Control Variables include: Year, Region, CAE, Firm size, Employee education, Age, and Firm Type. The base level of each interaction and categorical variable was omitted

1 exporting companies have a sales per employee value 21% lower, type 2 exporting companies have a value 18% lower, and type 3 exporting companies have a value 3% lower. Type 4 companies are the second companies that benefit the most from importing, with importing companies having 11% less sales per employee than type 0 importers.

In addition to these analyses, the interaction between the variables "firm type" and "export market" and "import market" was performed to analyze whether any type of company has a greater advantage in exporting to a particular market. Type 0 companies that export to both the EU and non-EU markets (export market 3) tend to benefit the most from exporting, while type 3 firms that export to export market 4 have the least benefit.

Exporting to multiple markets is generally more effective than exporting to a single market for type 0 and type 1 firms. For companies of types 2, 3, and 4, the impact of exports is higher for firms primarily focused on a specific market, especially the non-EU market.

Across all types of companies, focusing on firms that export to a single market, companies exclusively exporting to the non-EU market tend to exhibit a higher value of sales per employee compared to companies exclusively exporting to the EU market.

Regarding imports, it was found that companies of type 0, importing significant values from both the EU and non-EU markets, benefit the most from importing. Type 2 companies, primarily importing from the non-EU market, benefit the least

For types 0, 1, 2, and 4 companies, importing from both the EU and non-EU markets is associated with higher sales per employee compared to importing from only one market. However, for type 3 companies, importing from only one market leads to higher sales per employee than importing from multiple markets. Among types 0, 1, 2, and 4 companies, those importing primarily, but not exclusively, from the non-EU market demonstrate the highest sales per employee. In contrast, for type 3 companies, those exclusively importing from the non-EU market exhibit the highest sales per employee.

Unlike with exports, among the companies that export to only one market, types 0, 1, 2, and 4 companies importing from the EU market display better sales per employee. However, for type 3 companies, higher values are associated with imports from the non-EU market.

The main objective of this paper was to analyze the impact of exports and imports; however, it is also valuable to examine the impact of control variables

Regarding firm Size: micro-sized firms have the

lowest average sales per employee. Small firms show a 29% higher value than micro-sized firms, while medium and large firms exhibit a 72% higher value. Having in mind the firm age, older firms have higher sales per employee, with a 1% increase in age correlating to a 2% increase in sales per employee.

Firms without employees holding a university degree have the lowest sales per employee. Those with at least one employee holding a higher education degree and a workforce with a proportion of higher-educated individuals between 30% and 70% display 22% higher sales per employee. Firms with a percentage between 70% and 100% of employees with higher education degrees exhibit values 28% higher.

The years between 2011 and 2015 had a negative impact on firm performance, with 2012 recording the lowest sales per employee, approximately 10% lower than in 2010. However, 2019 showed the highest average sales per employee, about 13% higher than in 2010, with constant firm characteristics taken into account.

The same models presented earlier were run using the fixed effects method with clustered standard errors at a firm level. In these models, the adjusted R-squared value was lower, approximately 0.038, compared to 0.279 in the previous models.

Analyzing these models, it was found that compared to the OLS model, there are differences in the coefficient values, but the overall relationship between the variables remains consistent. Type 3 companies exhibit the highest sales per employee value, while type 0 companies show the lowest. Exporting and importing companies demonstrate higher sales per employee values compared to non-exporting and non-importing firms.

Firms exclusively exporting to the extra-community market benefit the most, whereas the benefit diminishes as the level of exports to the community market rises. Companies engaged in both importing and exporting activities have significantly higher sales per employee values compared to firms without international activities. Type 4 firms benefit the most from being exporters, while type 1 firms benefit the least.

The interaction between "firm type" and "importer" was not analyzed because only one of the coefficients in this interaction was significant, thus preventing the rejection of the null hypothesis.

By using the dependent variable "index growth" and employing the OLS method, it was observed that the variables related to import and export, their coefficients are significant and positive, suggesting a favorable impact on the company's growth. This implies that, on average, companies engaged in export or import activities experience higher growth

compared to those that do not participate in such activities. The coefficient of the importer variable is larger than that of the exporter variable, similar to other models.

Concerning export markets, companies benefit the most from exporting primarily to the non-EU market but not exclusively. Companies exclusively exporting to the EU market and those predominantly exporting to the EU market also exhibit favorable growth. However, the coefficient of export market 1 is not significant, making its analysis less reliable from an econometric perspective.

In terms of import markets, companies exclusively importing from the non-EU market demonstrate the highest growth rates, closely followed by companies primarily importing from the non-EU market but not exclusively. The other importing companies exhibit relatively similar levels of growth.

5. Conclusions

This dissertation evaluates the performance of companies considering some of their characteristics, depending on their focus, whether they are a company dedicated to selling products or providing services. It examines the impact of a company being an exporter or importer, or being a two-way trader, and also investigates for which types of companies this effect of export or import is high. Additionally, it looks at the effects of exporting to only one or multiple markets and which market demonstrates the best performance, both for exporters and importers.

From the descriptive analysis, it was noticed that, on average, importing companies outperformed non-importing ones, and exporters also showed better performance compared to non-exporting companies. When analyzing the models, it became clear that indeed, both exporting and importing companies demonstrated better performance. The data analysis only allows control for one variable, but using econometric models allows control for multiple variables. Since the coefficients are significant, it indicates that exporting or importing companies indeed show improved sales per employee. It was also found that companies engaging in export or import activities exhibit higher growth rates compared to those that do not. Two-way trading companies show greater benefits than one-way traders, displaying higher sales per employee and experiencing more significant growth.

Taking into account the export markets, it was observed, both through the fixed effects method and the OLS method, that there is generally a greater benefit in exporting to more than one market rather than exclusively to one market. Companies exporting at higher levels to the non-EU market showed a higher value of sales per employee.

Regarding the import markets, companies importing from more than one market, especially from the non-EU market, showed a higher value of sales per employee. Additionally, in terms of growth, importers with a higher percentage of imports from the non-EU market exhibited greater growth.

In both models, the coefficients of the export markets and import markets were significant (except for one), and all the coefficients were positive. This indicates that exporting, regardless of the market, has a positive effect on businesses, leading to increased productivity.

Furthermore, in all models, there is a positive benefit in being both importers or exporters for all types of businesses. All types of companies demonstrate a positive advantage, both in terms of sales per employee and in growth, when engaging in exporting or importing activities.

It was possible to observe the effects of exportation and importation based on the type of company and the market to which they export and import. This analysis allowed the identification of the companies that had better performance in these specific contexts.

In all the analyzed models, it was possible to observe a variation in the company's performance over the years. Between 2010 and 2015, there was a decline in the value of sales per employee, as well as a negative growth trend among the companies. However, from 2015 onwards, there was an increase in both sales per employee and the growth index of the companies.

In general, being an importer or exporter is beneficial for firms, resulting in a positive impact on sales per employee and overall firm growth. This trend holds true for all types of companies and for all the markets where companies engage in importing or exporting activities.

Some limitations of our work can be considered. In addition to those mentioned throughout the dissertation, it would be important to use more variables to better characterize the performance of companies. However, since the database consists of a wide variety of companies, it is difficult to find variables that reflect the characteristics of all types and sizes of companies.

Another limitation to consider is how we define exporters and importers. Some of the companies in our database may be indirect importers or exporters. For example, a company may sell its products to another Portuguese company, which then handles the export. In a way, this company is also an exporter, but our database does not allow us to analyze such situations. Another limitation of this study is related to the variable "sales per employee." Some companies may outsource certain stages or activities to other businesses, resulting in

the actual number of employees being higher than what is reported in our database.

In future work, it would also be interesting to add other characteristics of the companies to this analysis, such as research and development (R&D) investment. It would also be valuable to conduct a more detailed analysis of import and export markets, rather than a general one, by examining, for example, specific country-to-country trade dynamics.

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