Performance Differences between Exporters and Non-Exporters: the case of Portugal

Abstract

In the recent economic context in most developed economies, marked by a strong crisis and contraction of domestic demand, internationalization has been an imperative of survival for most companies. This paper aims to find out if there are significant performance differences between exporters and non-exporters in Portugal and if those performance differences vary according to the various measures of performance used in the study. This is relevant since extant literature leads to contrasting findings in the aspects under analysis (productivity, and profitability) and because there are no studies on this theme focused solely on the Portuguese case. Still, most of the literature agrees that exporters display superior productivity, size and age than non-exporters. More, they pay higher wages to their workers. Regarding profitability, no clear pattern has emerged yet between these two types of firm. So, with a sample of Portuguese manufacturing firms and considering the period 2008 to 2012, we perform OLS and Pooled OLS regressions for two measures: productivity and profitability. For the former the results are clear: being an exporter *per se* has a positive impact. This means that, in our sample, exporters are more productive than their purely domestic counterparts. For profitability, whilst the results mostly confirm our hypothesis, they are not as consistent as those for other measures. In short, our findings are overall in line with the majority of the literature reviewed and the hypotheses postulated.

JEL Code: F14; F23.

Keywords: Exporters; Non-exporters; Performance; Portugal.

Introduction

The recent economic context in Portugal, marked by a serious economic and financial crisis, led to a slowdown in domestic demand, causing many companies to go bankrupt and propelling the survivors to internationalize. Exports have been the main entry mode; yet over 90% of Portuguese companies never exported (INE, 2011). Exports are critical for a country like Portugal, with a sluggish domestic market, and without many other sources of growth in the near future.

This paper's theme is relevant for two reasons. First, although a vast literature exists exploring performance differences between exporters and non-exporters, important controversies remain. These studies, made in several countries, don't reach a consensus on whether there are or not benefits for exporting companies regarding some variables. It is also worth noting that even when these differences exist, not all studies report the same benefits, i.e., the benefits from exporting can vary greatly depending on the country of location of the company and even on the industrial sector, as argued by Stöllinger *et al.* (2012). A second reason has to do with the fact that there is no study solely about the case of Portuguese companies. As a result, this paper is intended to fill a gap in the currently available empirical literature.

The questions that this paper aims to answer are:

i. Are there significant performance differences between exporters and non-exporters in Portugal?
ii. Do those performance differences vary according to the various measures of performance used in the study (such as productivity, profitability and wages)?

Based on these questions, the paper has the following objectives:

(1) to present the theory about the differences in performance between exporters and non-exporters, and whether the former have an advantage over the latter;
(2) to review extant literature on this theme;
(3) to develop hypotheses based on the theory and on the literature review;
(4) to conduct a descriptive and informative analysis of the different characteristics and performance of exporters vs. non-exporters;
(5) it intends to test empirically, using econometric modelling, whether such performance differences exist with a dataset of Portugal exporting and non-exporting firms;

(6) to extract the appropriate policy conclusions arising from our empirical study.

The remainder of the paper will be organized as follows: the next section reviews th literature on the differences between exporters and non-exporters, organizing these studies according to different themes related to the dependent variables explored in the empirical part. That section also derives the hypotheses to be tested. After that, the empirical part of this work is developed, presenting the data and relevant descriptive statistics, as well as the methodologies and variables used. Next, the results of the regressions are presented. Finally, the last part is dedicated to the conclusions of the study and some policy implications drawn from the results.

1. Literature Review: Differences between Exporters and Non-Exporters

Bernard and Jensen (1995) can be considered the pioneering paper about the theme of differences between exporters and non-exporters (as Van Biesebroeck, 2005; Damijan and Kostevc, 2006; Wagner, 2007; ISGEP, 2008; Yang and Mallick, 2010; Haidar, 2012; Schröder and Sørensen, 2012; Wagner, 2012 and Vu *et al.*, 2014 state), leading the way on this issue, and becoming a pillar for other studies. Since then, numerous studies appeared, exploring different issues related to this theme for various countries across the world, like China (Yang and Mallick, 2010; Fu and Wu, 2013), Germany (Bernard and Wagner, 1997; Wagner, 2002; Fryges and Wagner, 2010), Italy (Castellani, 2002; Grazzi, 2012), Slovenia (Damijan and Kostevc, 2006; De Loecker, 2007), Spain (Delgado *et al.*, 2002; Fariñas and Martín-Marcos, 2007; Máñez-Castillejo *et al.*, 2010) and USA (Bernard and Jensen, 1995, 1999, 2004). The literature focused on this topic is quite diverse and, in some respects, leads to contrasting findings. Authors like Stöllinger *et al.* (2012), Golikova *et al.* (2012), Yang and Mallick (2010) report the existence of benefits of exporting that put exporters in a better position compared to non-exporters. Nevertheless, there are authors like Bernard and Jensen (1999: 3) that show that "shipments, productivity, and wages grow more slowly at exporters", so that the only benefit that can accrue from exporting is the company's increased probability of survival (10% higher for exporters), due to the greater stability and growth of employment. Bernard and Wagner (1997) find a similar result for Germany: compared to non-exporters, exporters are more likely to survive (with a 3 to

15% lower probability of failure over various horizons). Yet, Blalock and Gertler (2004) prove otherwise for Indonesia: the survival rate of exporters and non-exporters are similar.

1.1. Productivity

The most common difference between exporting and non-exporting companies mentioned in the literature relates to productivity, because not only it is a measure of performance itself, but also as it can influence other performance measures like profitability and wages.

1.1.1. Exporter Productivity Premium

It appears to be a stylized fact that there is an exporter productivity premium, i.e., exporters are more productive than non-exporters, as ISGEP (2008: 610) show: "the average exporter premium in the 14 countries, after controlling for individual fixed effects, is 7 per cent". Similarly, for the USA, Bernard and Jensen (1995) find that the value added per workers of exporters surpasses that of non-exporters by 15.8%, after accounting for several factors (industry, size and location). Castellani (2002), Bernard *et al.* (2003), Melitz (2003), Blalock and Gertler (2004), Wilhelmsson and Kozlov (2007), Egger and Kreickemeier (2012), Golikova *et al.* (2012), Grazzi (2012) and Stöllinger *et al.* (2012) find that exporting firms are more productive than non-exporting firms. Tsou *et al.* (2008) also conclude that Taiwanese exporters exhibit a superior TFP level than non-exporters by 10.55% (in 1991) or by 11.73% (in 1996).

Máñez-Castillejo *et al.* (2010) share this conclusion. In their study of Spanish firms, the authors, distinguishing firms according to their size, also verify that larger firms are always more productive than small ones (regardless of their exporting status). Máñez-Castillejo *et al.* (2010: 319) clarify: "We can rank these four groups of firms (from lowest to highest TFP) as follows: small non-exporters, small exporters, large non-exporters and large exporters". Bernard and Wagner (1997) estimate that this productivity advantage is about 19.4% (for shipments per employee) to 21.63% (for value added per employee) in Germany, Alvarez and López (2005) conclude that it is about 19% (for TFP) in Chile and De Loecker (2007) that it is approximately 29.59% for value added per worker and 58.63% for sales per employee, in Slovenia. Similarly,

Bernard and Jensen (1999) reveal that, in the USA between 1984 and 1992, exporter's productivity surpasses non-exporters' by 16.1-23.8% in terms of labour productivity or by 12.2 to 18.0% in TFP. Van Biesebroeck (2005), in his study for nine African countries, measured this difference as well and concluded that the productivity level of firms that export exceeds that of their exclusively domestic counterparts by 57.1% (OLS estimation) or by 28.4% (Production function estimation). In this regard, Clerides *et al.* (1998) also find that firms selling abroad are more productive than those serving only their home market. The authors confirmed this result for three countries using two different measures: labour productivity and average variable costs. Exporters in Colombia, Mexico and Morocco have a higher level of labour productivity and, likewise, enjoy lower average variable costs than their domestic counterparts (the only exception is for the average variable cost in Morocco, where there are no clear distinction between the two types of firm). Hence, "exporting firms are more efficient than nonexporting firms" (Clerides *et al.*, 1998: 941). In the same vein, using similar measures, Greenaway and Yu (2004) find a productivity advantage in favour of UK firms selling abroad. Greenaway and Yu (2004) also confirm this: exporters in the chemical industry have a 10.4% higher labour productivity, a 9.1% greater TFP and a 2% lower average variable cost than non-exporters. Even not being their focus, these authors also verify the same pattern in other manufacturing sectors. For Spanish manufacturing companies, Fariñas and Martín-Marcos (2007) show, with descriptive statistics, that exporters are more productive than firms serving only their home country, both in terms of labour productivity (by 38.5%) and total factor productivity (by 11%). The same result is achieved when estimating the productivity effect with a range of firm's characteristics as controls: companies selling overseas have an advantage of approximately 17% for labour productivity (value added per hour) and 7% for TFP. Recurring to stochastic dominance methods, Delgado *et al.* (2002) demonstrate the existence of an exporter productivity premium in Spain, given that exporters' productivity exceeds that of non-exporting firms, specifically "the median productivity of the former is 7% higher than the productivity of the latter" (Delgado *et al.*, 2002: 409). For Ireland, Ruane and Sutherland (2005), use another variable to evaluate productivity: the value of turnover per worker. Still with a different measure, the conclusion remains: exporting firms are more productive than their solely domestic

counterparts, even when estimating with random effects panel data and controlling for size, time, sector and firm-specific effects (exporters are 10.5% more productive). Separating exporters into two distinct groups, Alvarez (2007) also confirms this pattern for Chile, showing that sporadic exporters are 33% more productive than purely domestic firms, and permanent exporters surpass the sporadic ones by 28% in terms of labour productivity.

ISGEP (2008) refers that the productivity is greater the higher the ratio of exports to total sales, adding that "on average productivity premia are larger for countries with lower export participation rates, with more restrictive trade policies, lower per capita GDP, less effective government and worse regulatory quality, and for countries exporting to relatively more distant markets" (ISGEP, 2008: 631).

Providing another perspective on this issue, Helpman *et al.* (2004: 314) find that the companies' productivity level influences their status in the market: "firms sort according to productivity into different organizational forms". According to this, the authors distinguish between two levels of productivity. In the low productivity level, the least productive companies exit the market (otherwise they would face a negative profit) and the others remain producing only for the domestic market. In the high productivity level, there are firms that not only serve their own country but also sell overseas. Within this group, the most productive companies internationalize through FDI and the other high productivity firms through exportation. Hence, Helpman *et al.* (2004) show that exporters are not the most productive firms in the market, but they are always more productive than non-exporters. So, they provide evidence in favour of the exporter productivity premium. Moreover, Girma *et al.* (2005) achieve the same result in their study with UK firms comparing the productivity level of the same three kinds of firms: multinationals (both domestic and foreign), exporters and non-exporters. Damijan and Kostevc (2006) borne out these findings for Slovenia: considering the sample's descriptive statistics, it is clear that exporters display a higher value added per worker than solely domestic companies: Furthermore, exporting companies which are also engaging in outward FDI surpass domestic exporters and non-exporters.

Still within the group of authors that provide evidence in favour of this effect, Aw and Hwang (1995) confirm that exporters are more productive than non-exporters given their larger output-labour ratio. To justify this fact, Aw and Hwang (1995: 328) refer

that “the higher productivity among exporters appears to be related to more efficient use of inputs”, but they also add that “for 59% of all the firms that engage in the export market (…) exogenous technological factors appear to play a critical role in their higher productivity” (Aw and Hwang, 1995: 330). Furthermore, in their study with Taiwanese firms, the authors attempt to explain the contribution of these productivity differences for differences in firms’ output considering four electronic products. They show that the existing value-added differences between firms that export and those that only serve the domestic market are an effect of differences in productivity, but they are “product specific”. Depending on the considered electronic product this discrepancy ranges from 7 to 20% (or from 3 to 10% if estimated with constant returns to scale). For China, Yang and Mallick (2010) show, with descriptive statistics, that exporters display higher levels of productivity measured by TFP and sales per employee than purely domestic companies. Then, the authors confirm the results with matching techniques: exporters have an advantage of 24.3% in TFP and of 20.6% in sales per employee. Focusing on the case of Indian firms, Haidar (2012) finds likewise evidence that the exporters’ productivity level exceeds that of non-exporters. Firstly, when the author analyzed his sample’s mean values he observed that, regarding their total factor productivity, there are no considerable discrepancies between these two types of company. However, when estimating the export premium for productivity with an OLS approach, Haidar (2012: 1769) concludes: “exporters are on average 14.8% more productive than non-exporters during 1991–1997 and 9.3% more productive than non-exporters during 1998–2004”.

To provide a better understanding regarding the productivity level of exporters and non-exporters, Bernard and Jensen (2004) studied the productivity paths of these groups of firms in the USA during a period of five years. The first pattern verified is that continuous exporters are more productive than any other group (new exporters, exiting exporters and non-exporters) at any given moment of time, e.g. the productivity advantage of continuous exporters over purely domestic firms ranges from 8 to 9%. However, their productivity trajectory remains steady over time, meaning that exporting does not seem to influence their productivity level. It is worth noticing that the same happens with non-exporters, although at a much lower level. On the other hand, for new entrants, Bernard and Jensen (2004) observe that two years before entry their productivity level is somewhere between the productivity level of continuous exporters

(the higher threshold) and that of non-exporters (the lower threshold), but after starting to export their productivity converges (i.e., rises) to that of continuing exporters.

All above mentioned studies were conducted for the manufacturing sector. Yet, a productivity premium for exporting firms is also found in the services sector by Vogel (2011) for Germany, regarding value added per worker and turnover per employee. This result holds for the sample's mean values and for the pooled regression estimation (exporters have a higher labour productivity ranging from 12 and 20% in West Germany and from 5 to 18% in the East), but considering the fixed effects estimation, the differences between the two types of firms are not statistically significant.

On the contrary, Greenaway *et al.* (2005) show that, in contrast to the evidence in most countries, in Sweden there are no productivity differences between exporters and non-exporters, neither before nor after they start exporting. Using the sample's descriptive statistics, the authors observe that for the full sample, exporters display a lower TFP level (although when accounting for industry fixed effects there is a 10 percentage points advantage for exporters); then for both the matched and non-matched sample, results show that new exporters and non-exporters cannot be distinguished regarding TFP. For the authors, this is "probably driven by the extremely high openness of the Swedish economy" (Greenaway *et al*., 2005: 561), despite admitting other explanations. The same result is patent on the study of Girma *et al.* (2004) with Irish manufacturing plants. The authors investigate the relationship between domestic non-exporters, domestic exporters and domestic multinationals when it comes to sales per employee and value added per employee, which are measures for labour productivity. Girma *et al.* (2004) conclude that productivity of exporting and non-exporting firms is not significantly different, despite reporting that domestic multinationals are more productive than the other two kinds of companies. Wagner (2002) also explored if exporting exerts any kind of influence in firms' productivity. The author employs three different methods to compare exporters and non-exporters one year before the former start exporting. Firstly, the author employs a more traditional approach, i.e., the analysis of the mean values of his sample. This shows that exporters have a lower value of sales per worker than non-exporters. Contrarily, when Wagner (2002) estimates this difference through an OLS model, he found that new exporters have a greater labour

productivity by 3.89% than firms selling only in the domestic market, but it is statistically insignificant. Nonetheless, according to Wagner (2002: 290-291), the matching method is the one that provides the most reliable results as "a comparison of the average performance of export starters and non-exporters cannot reveal any causal impact of exports on plant performance due to self-selection of better plants into exporting". Comparing new exporting companies with their matched domestic counterparts, Wagner (2002) concludes that there are no significant differences between the two types of firms in terms of labour productivity.

There is also unfavourable evidence against the exporter productivity premium. For instance, Fu and Wu (2013), in their study for China, find that exporters have a lower productivity than their non-exporter counterparts (around 18.3% using their descriptive statistics), measured by the output per employee, than companies selling exclusively in their home market.

Still related to this subject, it is worth referring to the comprehensive study of Schröder and Sørensen (2012). These authors scan the studies of Bernard *et al.* (2003) and Melitz (2003) and prove that, despite the findings of these papers being interpreted as favourable for the exporter productivity premium, they only provide ambiguous evidence for this phenomenon. Schröder and Sørensen (2012) show that, within each model specifications, the results can conduct both to a positive or a negative exporter productivity premium. They further argue that, this is due to the fact that those studies use a theoretical measure for productivity (the marginal productivity) and when considering a quantifiable measure of productivity, such as the value added per worker, it is possible to verify that exporters can be less productive than non-exporters. Schröder and Sørensen (2012: 1329) explain: "the actual predictions of the theory for the sign and magnitude of the exporter productivity premium (…) depend on the distribution of marginal productivity in the industry and on the size and presence of fixed costs and mark-ups", respectively in Melitz (2003) and Bernard *et al.* (2003) models. Furthermore, Schröder and Sørensen (2012) also succeed to establish a positive relationship between the exporter productivity premium and the heterogeneity degree of a sample of companies, i.e., the more heterogeneous the firms, the lower this effect.

Table 1 provides an overview of the different studies and their respective findings about the exporter productivity premium.

Table 1 – Overview of studies about the Exporter Productivity Premium

References	Country	Sample (Years)	Methodology	Effect	Results
Aw and Hwang (1995)	Taiwan	2,384 Firms (1986)	Descriptive statistics; Translog production function; Cross-section	+	Exporters are more productive than non-exporters.
Bernard and Jensen (1995)	USA	408,442-411,574 Observations (1976-1987)	Descriptive statistics; OLS		
Bernard and Wagner (1997)	Germany	7,624 Plants (1978-1992)	Panel data		
Clerides *et al.* (1998)	Colombia, Mexico, Morocco	1,184 Firms (1981-1991); 2,800 Firms (1986-1990); 882 Firms (1984-1991)	Panel data; Full information maximum likelihood; Generalized method of moments		
Bernard and Jensen (1999)	USA	50,000–60,000 Plants (1984–1992)	Regression		
Castellani (2002)	Italy	2,898 Firms (1989-1994)	Descriptive statistics; Cross-section		
Delgado *et al.* (2002)	Spain	1,766 Firms (1991-1996)	Kolmogorov-Smirnov tests; Kernel estimators		
Bernard *et al.* (2003)	USA	200.000 Firms (1992)	Static Ricardian model of heterogeneous plants and trade; Simulation approach		
Melitz (2003)	∅	∅	Dynamic industry and general equilibrium model; Comparative static analysis		
Bernard and Jensen (2004)	USA	50,000-60,000 Plants (1983-1992)	Olley-Pakes (1996) production function		
Blalock and Gertler (2004)	Indonesia	20,018 Firms (1990-1996)	Descriptive statistics		
Greenaway and Yu (2004)	UK	461 Firms (1989-1999)	Descriptive statistics; Panel data		
Helpman *et al.* (2004)	USA; 27-38 European countries	961 (narrow sample) - 1,175 (wide sample) Observations (1994)	Regression; General Equilibrium Model		
Alvarez and López (2005)	Chile	5,000 Plants (1990-1996)	Panel data		
Girma *et al.* (2005)	UK	3,799 Firms (1990-1996)	Descriptive statistics; Kolmogorov-Smirnov tests		
Ruane and Sutherland	Ireland	2,854 Firms (1991-1998)	Descriptive statistics; Random effects panel data		

(2005)			regression		
Van Biesebroeck (2005)	9 sub-Saharan African countries	1,916 Firms (1992-1996)	Panel data; OLS; Production function estimation		
Damijan and Kostevc (2006)	Slovenia	903-1,379 Firms (1994-2002)	Descriptive statistics		
Alvarez (2007)	Chile	More than 5,000 Plants (1990-1996)	Regression		
De Loecker (2007)	Slovenia	6,391 Firms (1994-2000)	OLS		
Fariñas and Martín-Marcos (2007)	Spain	1,403 Firms (1990-1999)	Descriptive statistics; Regression; OLS; Differences and System General Method of Moments		
Wagner (2007)	34 countries	(1995-2006)	Survey of 54 microeconometric sudies		
Wilhelmsson and Kozlov (2007)	Russia	13,123-18,602 Firms (1996-2002)	Descriptive statistics; Pooled OLS; Fixed effects model		
ISGEP (2008)	14 Countries	9,909-1,310,771 Observations (1981-2005) (depending on the country)	Panel data; Pooled OLS; OLS with fixed effects		
Tsou *et al.* (2008)	Taiwan	5,923-9,639 Plants (1986-1996)	Descriptive statistics		
Egger and Kreickemeier (2010)	∅	∅	General equilibrium model		
Máñez-Castillejo *et al.* (2010)	Spain	1.175-1.716 Firms (1991-2002)	Kolmogorov-Smirnov tests; Propensity Score Matching (nearest neighbours, radius and kernel)		
Yang and Mallick (2010)	China	2,340 Firms (2000-2002)	Descriptive statistics; Propensity Score Matching (kernel, radius, calliper, nearest neighbour)		
Vogel (2011)	Germany	13,845 (East)-51.780 (West) Observations (2003-2005)	Descriptive statistics; Pooled regression; Fixed effects model		
Golikova *et al.* (2012)	Russia	499 Observations (2005-2009)	Descriptive statistics; Panel data		
Grazzi (2012)	Italy	60,000 Firms (1989-2004)	Non-parametric methods: Fligner-Policello test; Pooled OLS		
Haidar (2012)	India	33,510 Firms (1991-2004)	Descriptive statistics; OLS		

Stöllinger *et al.* (2012)	Austria	6,000-6,300 Firms (2002-2006)	OLS		
Wagner (2012)	6 countries	(2010-2011)	Survey of 7 empirical studies		
Wagner (2002)	Germany	9,425 Firms (1978-1989)	Descriptive statistics; OLS; Panel data; Propensity Score Matching (nearest neighbour)	N.S.	No significant productivity differences between exporters and non-exporters.
Girma *et al.* (2004)	Republic of Ireland	Observations: 307 DN, 647 DE, 246 MN (2000)1	Descriptive statistics; Kolmogorov-Smirnov tests		
Greenaway *et al.* (2005)	Sweden	3,570 Firms (1980-1997)	Descriptive statistics		
Fu and Wu (2013)	China	879,000 Firms (2004)	Descriptive statistics	-	Exporters are less productive than non-exporters.

Source: Own elaboration.

Regarding productivity *per se* as a measure of a firm's performance, there are, as expressed in the text above, diverse results for several measures and methods employed. Still, it is very clear that the majority of studies reviewed support a productivity superiority of exporters when compared to purely domestic firms. This idea is confirmed in Wagner (2007)'s survey of 54 microeconometric studies for the manufacturing sector and in Wagner (2012)'s survey of empirical studies for the services sector. Hence, this paper will test the following hypothesis:

H.1. Exporters are more productive than non-exporters.

1.2. **Profitability**

Regarding profitability, Fryges and Wagner (2010: 418) demonstrate that there is an exporter profitability premium, i.e., "exporting leads to a higher rate of profit". According to this result, the exporter productivity premium, which generates a productivity gain for exporters, allows them to face all the costs of internationalization (including the higher wages) and still have profit afterwards. This finding is clear when analysing the sample's mean values, when performing a t-Test and a Kolmogorov-Smirnov test and when estimating both a pooled data and a fixed effects model. Though, it is worth underlying that the rate of profit for exporters is superior to that of

[1] DN = Domestic Non-exporters, DE = Domestic Exporters, MN = Domestic Multinationals.

non-exporters by a very narrow margin (only by 1 pp the pooled model). However, the authors prove (with the pooled and the fixed effects model and a generalized propensity score methodology) that the relationship between the rate of profit and the export-sales ratio resembles an inverse U-shaped relation. Thus, profit increases until it hits the maximum (that the authors denominate threshold of internationalization and happens for firms that export 49% of their sales), from which rate of profit decreases. Fryges and Wagner (2010) highlight that even in the decreasing stage of the curve exporters are more profitable than non-exporters (except for the sub-interval from 89 to 100%, where only a minority of cases falls). Fryges and Wagner (2010: 417) refer that "firms that generate an export intensity of at least 89 per cent do not benefit from a higher rate of profit if compared with non-exporting firms".

Melitz (2003) and Egger and Kreickemeier (2010) also agree with the idea that exporters are more profitable than non-exporters because they are also more productive. The same finding is provided by Ruane and Sutherland (2005) for Ireland, measuring profitability with the gross value added per worker, both analysing the sample's mean values and controlling for a range of firm's characteristics (exporters are 7.7% more profitable). Providing a different view on this issue, Kneller and Pisu (2010) find, based on a survey of UK manufacturing firms, that starting to sell abroad generates higher profitability for exporting companies. More, the authors verify that this is due to a higher volume of sales (given the larger variety of markets served by the company) and not due to higher prices. Furthermore, Kneller and Pisu (2010) show that, besides this *ex-post* effect of exporting occurring for both export entrants and continuous exporters, it is greater for the latter. The fact that export starters are less profitable than older exporters might be correlated with another result of Kneller and Pisu (2010): the firms that just entered the export markets for the first time exhibit higher product development and generally have a lower export-sales ratio than experienced exporters.

Girma *et al.* (2004) have a contrasting opinion on this issue: They find that in Ireland there are no significant differences between domestic exporters and non-exporters concerning profit per employee (yet, they are both less profitable than domestic multinationals).

Helpman *et al.* (2004) go further, referring that exporters are less profitable than firms serving only their domestic market. They explain that, to stay in the market producing, a company incurs in fixed costs and the same happens with firms that internationalize. Hence, the profit of non-exporters is higher because their fixed costs are lower than the fixed costs needed to start exporting, as exporting firms are producing for both domestic and foreign markets. The same opinion is shared by Vogel and Wagner (2009) who find, for the German business services sector, that selling abroad makes the companies less profitable than serving exclusively the home market. This conclusion holds for the various methods used, namely an estimation using pooled data and a generalized propensity score methodology. They prove that exporters' rate of profit is surpassed by that of purely domestic firms in approximately 4 and 0.7 percentage points, when considering the pooled data model without and with fixed effects, respectively. Still, Vogel and Wagner (2009: 12) argue that "The negative exporter premia found in regression models using pooled data for exporters and non-exporters cannot be interpreted as indicators for a negative causal effect of exporting on profitability". And another conclusion arises: it appears that there is a quadratic relationship between the rate of profit and the export-sales ratio. However, when including another variables, it seems more likely that such relationship is of an S-shaped type, i.e., in a first stage when the export intensity rises, the rate of profit decreases until it hits the minimum for the 32% of exports over total sales and thereafter, the rate of profit increases until its maximum, registered for the export-sales ratio of 78%. This finding also emerges when the authors perform an estimation of the dose-response function for the more specific relationship between the export intensity of 2004 and the rate of profit of 2005: the only difference is that the maximum registered for an export-sales ratio of 44%. Furthermore, Vogel and Wagner (2009) discover that this negative profitability premium of exporters is patent even two years before these firms enter the external markets and it is about 4 percentage points when comparing to non-exporters. In short, Vogel and Wagner (2009: 23-24) refer that "in the services sector (but not in manufacturing) any cost advantage due to higher productivity is "eaten up" by higher costs related to export activities, or by higher wages paid in exporting compared to non-exporting firms".

Similarly, also for the German business services sector, Vogel (2011) concludes that, both in East and West Germany, and regarding turnover profitability, exporters have a poorer performance than purely domestic firms. This finding is valid when the author analyzes the average values of his sample and when he employs two different methods of estimation (with and without controls for the amount of workers): in the pooled regression exporting companies are approximately 3 percentage points less profitable than non-exporters and in the fixed effects model the unfavourable difference is about 1 pp. Moreover, Vogel (2011) investigated the profitability in the pre-entry into the export markets period. Still, he finds that even one and two years prior to entry, future exporters are already about 2 percentage points less profitable than domestic-oriented companies in West Germany; more, this difference increases to 3 pp in the entry year. In East Germany there are no considerable differences between the two groups.

In turn, Grazzi (2012) finds ambiguous evidence regarding profitability: for some sectors and years, exporters are more profitable than non-exporters, but for others non-exporters surpass the firms selling abroad regarding their return on sales. The author provides two possible explanations. Firstly, he states that selling in international markets entails significant costs which can prevent exporters from being profitable. Alternatively, it might be the case that "the fraction of smaller, not exporting firms might serve some residual market niches, so that their profitability is not squeezed by competitors (both at national and international level)" (Grazzi, 2012: 434). Vu *et al.* (2004) also find uncertain results for Vietnam, showing that contrarily to the OLS approach (which evidenced no considerable differences), when using a quantile regression, there are differences between exporters and non-exporters regarding their profitability growth. Specifically, exporters have a higher profit growth in percentiles 70 and 80, but lower for the percentile 10. Vu *et al.* (2014: 444) explain that this is due to the higher productivity of the firms selling overseas, but "for firms with low profit growth at 10th percentile, these advantages are possibly absorbed by costs relating to trading activities on overseas markets such as entry costs and advertisement costs". More, Vu *et al.* (2014) show that the profitability growth is greater for larger, young and innovative companies.

Table 2 below synthesizes the diverse opinions in the literature regarding the relationship between profitability and the exporting activity.

Table 2 – Overview of studies about the Exporter Profitability Premium

References	Country	Sample (Years)	Methodology	Effect	Results
Melitz (2003)	∅	∅	Dynamic industry and general equilibrium model; Comparative static analysis	+	Exporters are more profitable than non-exporters.
Ruane and Sutherland (2005)	Ireland	2,854 Firms (1991-1998)	Descriptive statistics; Random effects panel data regression		
Fryges and Wagner (2010)	Germany	14,983-16,775 Firms (1999-2004)	Descriptive statistics; Kolmogorov-Smirnov tests; OLS; Pooled data regression; Fixed enterprise effects model; Fractional logit model; Generalised propensity score		
Egger and Kreickemeier (2010)	∅	∅	General equilibrium model		
Kneller and Pisu (2010)	UK	343 Observations (2005)	Survey data; Factor analysis; Probit		
Girma *et al.* (2004)	Republic of Ireland	Observations: 307 DN, 647 DE, 246 MN (2000)[2]	Descriptive statistics; Kolmogorov-Smirnov tests	**N.S.**	No significant differences between exporters and non-exporters regarding profitability.
Helpman *et al.* (2004)	USA; 27-38 European countries	961 (narrow sample) - 1,175 (wide sample) Observations (1994)	General Equilibrium Model	-	Exporters are less profitable than non-exporters.
Vogel and Wagner (2009)	Germany	23,076-24,934 Firms (2003-2005)	Pooled data regression; Fixed enterprise effects model; OLS; Fractional logit model; Generalized propensity score		
Vogel (2011)	Germany	13,845 (East)-51.780 (West) Observations (2003-2005)	Descriptive statistics; Panel data; Pooled regression; Fixed effects model; OLS		
Grazzi (2012)	Italy	60,000 Firms	Non-parametric methods:	**Ambi**	Exporters

[2] DN = Domestic Non-exporters, DE = Domestic Exporters, MN = Domestic Multinationals.

		(1989-2004)	Fligner-Policello test; Pooled OLS	**guous**	are more profitable than non-exporters in some sectors and years, but in others it is quite the contrary.
Wagner (2012)	5 countries	(2008-2011)	Survey of 9 empirical studies		
Vu *et al.* (2014)	Vietnam	2,821, 2,635 and 2,655 Firms (for 2005, 2007 and 2009, respectively)	OLS; Fixed effects quantile regression		

Source: Own elaboration.

Profitability is possibly the most divergent measure of performance given its very conflicting results, as emphasized in the survey performed by Wagner (2012). Yet, the majority of the studies reviewed in the section are in favour of a positive exporter profitability premium. Hence, based on extant literature, we hypothesize that

H.2. Exporters are more profitable than non-exporters.

2. Empirical Investigation

2.1. Data

The empirical part of this paper will be based on the SABI database (Bureau Van Dijk, 2014) which provides data regarding Portuguese firms This database includes a wide range of data, mainly focused on financial and accounting variables.

The data was collected (in July 2014) for five years, from 2008 to 2012, given that this is the only period of time for which we can guarantee the existence of some pertinent variables for this research, such as all sales-related variables. Still, the criterion used to select the firms considered for the study was to exclude the micro enterprises, which as established by a recommendation of the European Commission (EC, 2003) and followed by other institutions (OECD, 2005; Eurostat, 2011), are firms with less than ten employees.[3] The data extractions were done for each year individually imposing that only the firms with a minimum of ten employees would fit in the sample. Subsequently, since we seek to follow the companies' evolution during the considered

[3] The option to use the number of employees instead of the company's turnover or balance sheet total (criteria also considered by those institutions) relates to the fact that total employment is a much more stable measure, contrasting with the volatility of the other measures.

period, we excluded from the sample all those enterprises with data for only four or less years; in other words, we kept solely companies listed in all the five years (2008-2012).

Then, we focused our analysis merely on manufacturing firms, i.e., firms that belong to section C (subsectors 10 to 33) of Primary NACE Rev. 2 code. It was found that the presence of services would bias the research (presence of non-tradables, etc). Moreover, most of the empirical literature reviewed focused only on manufacturing, and this would allow a better comparison of our results with those emanating from the literature reviewed.

Additionally, we performed our estimations imposing a criterion to the variable **age**: firm's age equal to or below 28 years. This is justified by the fact that, as explained in section 2.3.1.2, we are interested in ascertaining the existence of an inverted U-shaped relationship regarding age, and when estimating for all the firms the results were biased by older firms. So, our threshold of 28 years takes into account that most of the Portuguese internationalized firms appeared in the period after Portugal joined European Union in January 1st, 1986. As proved by INE (2007: 90-91), until this date, Portugal was not very engaged in international trade: in 1986, Portugal had an openness level (measured by the ratio of imports plus exports over GDP) of only 23.4%, clearly under the UE15's average value (approximately 55%). This was the key reason for choosing the abovementioned threshold.

Surprisingly, after detecting a few cases of negative labour productivity – a technical impossibility - that could raise estimation issues, and extreme cases that could bias our estimates, we decided to clean the dataset from these observations and so estimate the models only for enterprises with a gross value added per employee equal to or greater than zero. More, after finding a few outliers in labour productivity, we also decided to exclude these cases from our sample, since "(...) they can have an extreme effect on an analysis" (Acock, 2012: 264). So, we implemented another imposition: labour productivity equal to or greater than 100 (thousand Euros). Hence, this research is based on an unbalanced panel of firms for the period 2008 to 2012. Figure A, in appendix, sums up of the data treatment process and the number of firms in each stage.

Under these circumstances, the final database (for the period 2008-2012) is composed by 4,536 firms that are exclusively exporters (16%), 9,977 importers/exporters (35%), 11,891 purely domestic firms (42%) and 2,210 only

importers (8%), resulting in a total of 28,614 firms considered. Since this paper's focus is on the differences distinguishing exporting from non-exporting firms, for empirical purposes we considered that exporters are both those firms only dedicated to exporting and those which are simultaneously exporters and importers and that the group of non-exporters encompasses only importers and companies that neither import nor export. Table 3 below provides a clearer overview of each category and the number of companies contained within each one Both types of firms are almost – incidentally - equally represented in the sample.

Table 3 – Number of Firms (and percentage) in Each Category of Firm (Period 2008-2012)

Firms that only Export	4,536	(15.85%)	Exporters	14,513 (50.72%)	28,614
Firms that both Export and Import	9,977	(34.87%)			
Firms that neither Export nor Import	11,891	(41.56%)	Non-Exporters	14,101 (49.28%)	
Firms that only Import	2,210	(7.72%)			

Source: Own elaboration based on Stata 12.0.

2.2. Descriptive Analysis

Before proceeding with the estimations of the previously mentioned hypotheses for each performance measure analyzed in this study, Table 4 below presents a brief but enlightening descriptive analysis of the most pertinent variables studied.

Comparing their mean values, exporters display in general higher values for the characteristics under analysis, when compared with their purely domestic homologous. On average, exporters are 47% more productive (in terms of labour productivity), employ twice more employees and pay 24.6% higher wages per worker. The result for wages is understandable since internationalized companies dispend 3 times more for total wages and each employee costs them, on average, per year about 25.5% more than in non-exporters. More, besides being larger concerning total employment, this advantage of exporting companies is also patent in the value of total sales, where they surpass non-exporters by approximately five and a half times. Moreover, those companies that export sell about 3 times more even in the home market than their domestic-oriented homologous; this result is consistent with the one of Van Biesebroeck (2005). On average, exporters are also 2 years older than non-exporters. All these

predictions are fully in line with the literature. We can see that regarding profitability, in contrast to the reviewed literature, a clear pattern emerges. On average, exporters are more profitable than non-exporters, in terms of profit per employee (about 3 times), return on sales (7 times), profit margin (10 times) and return on assets (64 times). So, our descriptive results are consistent with our hypothesis of this performance measure. Additionally, according to the results, exporting companies show as well 6 times superior turnover and 10 times higher net income than purely domestic firms, and consequently, they pay 5 times more income taxes. Interestingly, exporters are 10% less indebted than their domestic counterparts.

Table 4 – Descriptive Statistics (2008-2012)

	Labour Productivity (th €)	Profit Margin (%)	Profit per Employee (th €)	Return on Assets (%)	Return on Sales (%)	Wages per Employee (th €)	Wages (th €)	Yearly average cost per employee (th €)
Exporters								
Mean	24.57632	1.287982	2.529846	2.412953	12.90967	12.44292	812.3906	15.7886
Minimum Value	0.13825	-685.98	-103.4286	-262.31	-396.2652	0.6281765	12.3632	0.84897
Maximum Value	99.92151	140.83	71.66924	121.94	92953.08	49.65015	84,236.57	65.74295
Observations	14,513	14,509	14,513	14,513	9,414	14,495	14,495	14,513
Non-Exporters								
Mean	16.6951	0.1253012	0.9498192	0.0376945	1.774188	9.986194	273.5613	12.58061
Minimum Value	0.0144913	-380.86	-72.586	-984.72	-380.848	0.53508	5.3508	0.64974
Maximum Value	97.89074	55.54	60.6095	262.59	220.0894	70.90903	31,445.15	76.59143
Observations	14,101	14,095	14,101	14,097	6,520	14,085	14,085	14,101

	Number of Employees	Age (years)	Total Sales (th €)	Domestic Sales (th €)	Turnover (th €)	Indebtness (%)	Income Tax of the Financial Year (th €)	Net Income of the Financial Year (th €)
Exporters								
Mean	59.67677	16.71246	7,242.97	3,572.674	7,470.157	66.87453	64.27502	152.5554
Minimum Value	10	0	0.036	0.014	4.088	2.76	-7,560.528	-48,757.55
Maximum Value	3,593	28	2,246,114	764,502.8	2,246,114	609.67	17,461.67	59,783.7
Observations	14,513	14,513	13,757	13,552	14,507	14,513	13,807	14,513
Non-Exporters								
Mean	25.52372	14.00071	1,309.225	1,287.927	1,372.463	73.93935	12.20845	15.51728
Minimum Value	10	0	0	0	6.91125	0	-1,378.17	-7,110.749
Maximum Value	1,592	28	379,428.6	379,428.6	411465.9	997.21	3,296.05	9,016.762
Observations	14,101	14,101	9,947	9,843	14,095	14,080	12,187	14,101

Source: Own elaboration based on Stata 12.0.

2.3. Methodology

This section presents the models used to test the hypotheses formulated above. Additionally, it provides an explanation of the types of models used, and of the variables they include. Finally, it presents the results of the econometric estimations.

2.3. 1 Variables

This section presents and explains the variables that will be used as proxies to estimate the models reported to test the hypotheses advanced in section 1.

2.3. 1.1 Dependent Variables

The performance measures will be our dependent variables. Performance measures encompass both productivity and profitability measures. Firstly, as a proxy for productivity, the labour productivity variable (**labprod**) will be used, computed as gross value added per employee, the most used measure in the reviewed literature concerning productivity (e.g., Bernard and Jensen, 1995, 1999, 2004; Bernard and Wagner, 1997; Clerides *et al.*, 1998; Castellani, 2002)[4]. Regarding profitability, we have tested several proxies for the dependent variable (e.g., profit per employee, return on assets, return on sales). Still, we chose profit margin (**profmg**) as our dependent variable given that it guaranteed the best results. This variable is drawn directly from SABI.

Table 4 sums up the most pertinent information about the dependent variables.

Table 5 – Synthesis of the Dependent Variables

Performance Measure	Dependent Variable	Description	Unit	Variable name on Stata
Productivity	Labour Productivity	Gross Value Added / Number of employees	Thousands euros	labprod
Profitability	Profit Margin	(P/L before tax / Operating revenue/turnover) * 100	Percentage	profmg

Source: Own elaboration.

[4] Other examples are Wagner (2002), Bernard *et al.(* 2003), Girma *et al.* (2004), Greenaway and Yu (2004), Helpman *et al.* (2004), Van Biesebroeck (2005), Damijan and Kostevc (2006), Alvarez (2007), De Loecker (2007), Fariñas and Martín-Marcos (2007), Wilhelmsson and Kozlov (2007), ISGEP (2008), Máñez-Castillejo *et al.* (2010), Vogel (2011), Golikova *et al.* (2012), Grazzi (2012), Schröder and Sørensen (2012) and Fu and Wu (2013).

2.3. 1.2 Independent Variables

Our main variable of interest is the export status, since we are interested in testing if being internationalized through exports impacts and, to what extent, performance. Therefore, our main explanatory variable is the export status. The variable used in this study is based on a categorical variable drawn directly from SABI and concerning four different categories[5]. As explained in section 2.1, we created a new variable considering only two groups: exporters (aggregating firms that only export and firms that export and import) and non-exporters (i.e., firms that only import and firms that neither import nor import). Hence, the variable **exporter** is a dichotomous variable assuming the value 1 if the firm is an exporter and the value 0 otherwise.

Variables regarding relavant characteristics of the firms were also considered.

One of such characteristics was wages, proxied by wages per employee.

Another feature considered in this study was size, proxied by total employment (**employ**), measured as the number of employees in each company. Since we are also interested in ascertaining the existence of an inverse U-shaped relationship between our dependent variables and size, we add as an independent variable the squared number of employees (**employ_sq**). Hence, **employ** is expected to have a positive sign and **employ_sq** to have a negative sign..

Additionally, an interaction term for exporter and size was included, computed as the multiplication between the dummy for export status (**exporter**) and total employment (**employ**). The resulting variable is called **expsize**.

Another characteristic considered is the age of the company (**age**). To present this variable, we computed by calculating the number of years since the company's establishment date until each year considered (i.e., 2008 until 2012). To verify the existence of a quadratic relationship, we also include the variable **age_sq,** which is the squared age of the company. Once more, we expect the **age**'s coefficients to be positive and the **age_sq**'s to be negative.

Lastly, we also take into consideration the sector of the firm. We drew directly from SABI information about the four-digit Primary NACE code (Rev. 2) of each company, using their respective two-digits categories. As we are only using manufacturing firms, several dummies were created for each subsector of section C (manufacturing) of

[5] This variable reports the export status of the firm only for the last year the firm provided that information (thus it does not report changes in export status).

NACE rev. 2. Thus, the dummies are: **sector_10**, which takes the value 1 if the firm is engaged in activities of the subsector 10 (and 0 otherwise), **sector_11** that assumes the value 1 if the firm is engaged in activities of the subsector 11 (and 0 Otherwise) and so on until subsector 33. We dropped **sector_12** and **sector_19** due to lack of observations. It is a common approach to take as the reference category the one that has more observations (see table A1 in Appendix), which in our sample, is the **sector_25** dummy variable; hence, this will be our omitted category.

A brief summary of the independent variables is presented in table 6 below.

Table 6 – Synthesis of the Independent Variables

Characteristic	Independent Variable	Description	Unit	Variable name on Stata	Expected Sign
Export Status	Export Status (2 categories)	Binary variable: 1=exporter, 0=non-exporter	{0,1}	exporter	+
Wages[6]	Wages per employee	Wages / Number of employees	Thousands euros	wages_emp	+
Size[7]	Employment	Number of employees	Number of employees	employ	+
	Employment squared	(Number of employees)^2	-	employ_sq	-
Exporter and Size	Interaction term between export status and size	Exporter * Number of employees	-	expsize	
Age	Company's Age	Number of years since the year of establishment	Years	age	+
	Company's Squared Age	(age)^2	-	age_sq	-
Sector	Manufacturing subsector dummies (i=10,...,33)	Binary variable: 1=firm is engaged in the subsector i, 0=otherwise	{0,1}	sector_i	

Source: Own elaboration.

2.3. 2 Econometric Model and Estimations

[6] Despite reporting only the results for wages per employee, we tested other proxies for wages as an independent variable, like wages and yearly average cost per employee.

[7] Despite reporting only the results for employment, we tested other proxies for size as an independent variable, like total sales and turnover.

The hypotheses were tested applying an OLS approach for each year separately. The OLS approach is widely used in the literature that this work is based on in order to estimate the export premia for various performance measures and characteristics of the companies. For instance, it was used by Bernard and Jensen (1995) in their pioneering work regarding this theme. More, it was also used by Van Biesebroeck (2005), Wagner (2002), De Loecker (2007), Haidar (2012) and Stöllinger *et al.* (2012). All the estimations were performed using Stata (version 12.0), a statistical and econometric software that strives for simplicity and clarity on one hand, but also for accuracy and precision on its outputs (Acock, 2012: 4).

Before estimating, the strength of the relationship between the different variables in the study was tested. The correlation matrix is presented in Table A1 (in Appendix). We can see that there is a strong correlation between **labprod/wages_emp** and between **employ/expsize**. There is also a strong relationship, as expected, between **age/age_sq** and **employ/employ_sq**. We can also note a moderate correlation between **labprod/profmg**, but it is not pertinent since there is no regression in which both variables appear. The rest of the correlations are weak.

The first hypothesis to be tested is the one regarding the productivity performance of the two kinds of firms in study (i.e., H.1.), which speculates that exporters have a higher productivity level than those companies that sell purely on their domestic market. To test it, we will perform a regression of labour productivity (**labprod**) on a set of independent variables presented in section 2.3.1.2., among which is our variable of interest: exporter. Basing ourselves on the descriptive statistics and on the literature, we expect β_1 to be positive and statistically significant.

$$\mathbf{labprod_{it}} = \alpha + \beta_1\, \mathbf{exporter_{it}} + \beta_2\, \mathbf{wages_emp_{it}} + \beta_3\, \mathbf{employ_{it}} + \beta_4\, \mathbf{age_{it}} + \beta_5\, \mathbf{age_sq_{it}} + \beta_6\, \mathbf{sector_10_{it}} + \ldots + \beta_{27}\, \mathbf{sector_33_{it}} + \boldsymbol{\varepsilon}_i \qquad \mathbf{(1)}$$

After analyzing productivity, we studied the relationship between exporting activity and profitability. A regression of the following form was estimated:

$$\mathbf{profmg}_{it} = \alpha + \beta_1\ \mathbf{exporter}_{it} + \beta_2\ \mathbf{wages_emp}_{it} + \beta_3\ \mathbf{employ}_{it} + \beta_4\ \mathbf{employ_sq}_{it} + \beta_5\ \mathbf{age}_{it} + \beta_6\ \mathbf{age_sq}_{it} + \beta_7\ \mathbf{sector_10}_{\mathbf{it}} + \ldots + \beta_{27}\ \mathbf{sector_33}_{\mathbf{it}} + \varepsilon_i \qquad \mathbf{(2)}$$

Our descriptive statistics' results, as well as the studies analyzed in this paper, are ambiguous regarding profitability. Still, as postulated in hypothesis H.2., we expect exporters to be more profitable than non-exporters, i.e., we expect a positive sign of the coefficient associated with the exporter variable (β_1).

As a robustness check for our OLS results, we will also test equations (1) and (2) with a Pooled OLS model.

2.4. Results and Discussion

In the present section, we provide and analyze the results of the estimation of equations (1) and (2) through OLS. The results are provided in tables 7 and 8.

Before explaining the actual results, it is important to stress that after estimating the models we tested for heteroskedasticity with the Breusch-Pagan test (Breusch and Pagan, 1979),, leading to reject the null hypothesis of homoskedasticity. With heteroskedasticity, the OLS estimates, whilst still centric and consistent, are no longer best linear unbiased estimates (BLUE) (Oliveira *et al.*, 2011: 261). As Breusch and Pagan (1974: 1287) refer, in the absence of homoskedasticity "the loss in efficiency in using ordinary least squares (OLS) may be substantial and, more importantly, the biases in estimated standard errors may lead to invalid inferences". So, in order to correct for this, we use the "heteroskedasticity-consistent covariance matrix estimator" (White, 1980: 821), i.e., we present our regressions with robust standard errors.

2.4.1. OLS Results

Labour Productivity

Firstly, as table 7 reports, our main variable of interest (i.e., export status) is statistically significant in all years considered and presents the expected sign. The same happens for wages per employee and age. Hence, the results are consistent with our hypothesis (H.1.) that exporting companies are more productive, in terms of labour productivity, than domestic-oriented firms: in 2009, being an exporter leads to an advantage of about 2,600€/employee and this is statistically significant at 1%. The

relationship with wages per employee is coherent with our predictions: if wages per employee rise 1 (thousands euros), gross value added per worker increases approximately 2,000€ in all years of the period.

Importantly, and as expected, we verify the existence of an inversely U-shaped relationship between labour productivity and age in some years, since the coefficient of **age** is positive, and the coefficient of **age_sq** is negative. This means that gross value added per employee increases with the age of the firm, until it hits its peak. Thereafter, labour productivity starts a decreasing pathway.

Lastly, employment is not statistically significant.

Table 7 – OLS Results of Labour Productivity on Firm Characteristics (Period 2008-2012)[8]

Independent Variables	Years 2008	2009	2010	2011	2012
exporter	2.543013*	2.565043*	2.25747*	2.278479*	2.71218*
	[0.2883067]	[0.310089]	[0.2672776]	[0.270908]	[0.3209334]
	(8.82)	(8.27)	(8.45)	(8.41)	(8.45)
wages_emp	1.882621*	1.899515*	1.834961*	1.8392*	1.794693*
	[0.0487113]	[0.054525]	[0.0538183]	[0.0459517]	[0.0537576]
	(38.65)	(34.84)	(34.10)	(40.02)	(33.38)
employ	-0.0061589**	-0.0009461	-0.0008743	0.0036833	0.0094976***
	[0.0028883]	[0.0043086]	[0.0030754]	[0.0042307]	[0.0052322]
	(-2.13)	(-0.22)	(-0.28)	(0.87)	(1.82)
age	0.1844539*	0.085144	0.1455335***	0.1917358**	0.0806882
	[0.0580335]	[0.070141]	[0.0741834]	[0.0802869]	[0.0962494]
	(3.18)	(1.21)	(1.96)	(2.39)	(0.84)
age_sq	-0.0077255*	-0.0049737**	-0.0065695*	-0.0082067*	-0.0043822
	[0.0019804]	[0.0023387]	[0.0023515]	[0.0024883]	[0.0028488]
	(-3.90)	(-2.13)	(-2.79)	(-3.30)	(-1.54)
expsize	0.0116242*	0.0079007	0.0118025*	0.0075916	0.0016715
	[0.0041559]	[0.0051223]	[0.003795]	[0.0046985]	[0.0058608]
	(2.80)	(1.54)	(3.11)	(1.62)	(0.29)
Intercept	-0.7172857	-1.030256	-1.926709**	-3.148266*	-2.974462*
	[0.6739916]	[0.7773694]	[0.822961]	[0.8215043]	[1.007171]
	(-1.06)	(-1.33)	(-2.34)	(-3.83)	(-2.95)
Subsector Dummies	Yes	Yes	Yes	Yes	Yes
R-squared	0.6124	0.5982	0.6275	0.6249	0.6021
F statistic	242.50	213.97	216.05	218.63	181.95
Observations	6,069	5,874	5,716	5,531	5,390
Robust	Yes	Yes	Yes	Yes	Yes

Source: Own elaboration based on Stata 12.0.
Note: The values in brackets are the standard errors and in curved parenthesis are the t-statistics. * means significance at 1% level, ** denotes significance at 5% level and *** stands for significance at 10% level. The expression "robust" stands for correction for heteroskedasticity with robust standard errors.

Profit Margin

[8] Despite reporting only the results for the regression with subsector dummies, we tested the same equation without them.

Table 8 presents the results for the regression of profit margin on several independent variables. Exporter, the key explanatory variable on our analysis, does not present a pattern as clear-cut as the previous performance measure (productivity). The coefficient is positive in all years except 2009. For instance, in 2008, the results imply that, *ceteris paribus*, being an exporter leads to a slight increase (0.7 pp) in profit margin and this is statistically significant. More, it appears that this effect was enhanced in 2011 and 2012 (0.8 and 1.7 pp). However, in 2009 and 2010 this effect is statistically insignificant. So, we can conclude, for three out of five years that profit margin is more favourable to exporters than to non-exporters (with everything else constant). This is broadly in line with hypothesis H.2: exporters are more profitable than non-exporters.

Table 8 – OLS Results of Profit Margin on Firm Characteristics (Period 2008-2012)[9]

Independent Variables	Years				
	2008	2009	2010	2011	2012
exporter	0.6485496***	0.2456969	0.1037054	0.8112503**	1.686285*
	[0.3497685]	[0.360142]	[0.3262715]	[0.359102]	[0.5260206]
	(1.85)	(0.68)	(0.32)	(2.26)	(3.21)
wages_emp	0.1065731*	0.0470003	0.1224614*	0.1474449*	0.2947039*
	[0.0357449]	[0.0622166]	[0.0380905]	[0.0328005]	[0.0551994]
	(2.98)	(0.76)	(3.22)	(4.50)	(5.34)
employ	-0.0049852	-0.0052719***	-0.0055898***	0.0034406	0.0100691***
	[0.0038146]	[0.0027215]	[0.0029031]	[0.0054154]	[0.0053315]
	(-1.31)	(-1.94)	(-1.93)	(0.64)	(1.89)
age	0.2710261**	-0.0888453	0.0731861	0.0712741	-0.0916867
	[0.10506]	[0.1002875]	[0.0843768]	[0.1156157]	[0.1638]
	(2.58)	(-0.89)	(0.87)	(0.62)	(-0.56)
age_sq	-0.0088189*	0.0020895	-0.003688	-0.0035612	0.0010241
	[0.0033785]	[0.0032993]	[0.0026417]	[0.0036517]	[0.0049676]
	(-2.61)	(0.63)	(-1.40)	(-0.98)	(0.21)
expsize	0.0037507	0.004538	0.006916**	-0.0015115	-0.0075989
	[0.0038895]	[0.0029026]	[0.003168]	[0.0055853]	[0.0055733]
	(0.96)	(1.56)	(2.18)	(-0.27)	(-1.36)
Intercept	0.6530844	3.500658*	1.26058***	-1.001097	-4.345852*
	[1.025922]	[1.032505]	[0.7560813]	[0.9703761]	[1.384656]
	(0.64)	(3.39)	(1.67)	(-1.03)	(-3.14)
Subsector Dummies	Yes	Yes	Yes	Yes	Yes
R-squared	0.0415	0.0335	0.0226	0.0316	0.0282
F statistic	10.23	7.54	6.46	7.31	9.15
Observations	6,069	5,873	5,713	5,529	5,386
Robust	Yes	Yes	Yes	Yes	Yes

Source: Own elaboration based on Stata 12.0.

Note: The values in brackets are the standard errors and in curved parenthesis are the t-statistics. * means significance at 1% level, ** denotes significance at 5% level and *** stands for significance at 10% level. The expression "robust" stands for correction for heteroskedasticity with robust standard errors.

[9]Despite reporting only the results for the regression with subsector dummies, we tested the same equation without them.

Concerning wages per employee, the results show that although its influence on profit margin is always positive, it is statistically insignificant in 2009. This means that, keeping all other variables unchanged, when wages per employee increases 1 unit (thousands of Euros), profit margin rises approximately 0.1 to 0.3 pp (depending on the year considered). This might be related to our finding about gross value added per employee that when wages per worker increase, labour productivity increases as well. Employment is significant only in three years and it is negative from 2008 to 2010, meaning that when employment increases, profit margin decreases (which is understandable, since more employees imply more costs); yet it is positive in 2011 and 2012. Additionally, we attempt to ascertain the existence of an inverted U-shaped relationship between profit margin and age, but this is only proved in 2008. Lastly, the interaction term is mostly statistically insignificant.

2.4.2. Pooled OLS Results

After running an OLS regression year-by-year (cross-section), we also applied a Pooled OLS model to our sample. Table 9 below shows the results for these estimations.

In terms of labour productivity, as well as in the OLS model, our key variable (exporter) is significant and positive; more, its coefficient is very similar in both models. Also, wages per employee continue to have a positive influence in labour productivity. We saw that he OLS results were not conclusive regarding employment; the pooled OLS coefficient reveal that employment has a positive impact on gross value added per worker, although it is not significant. As in the OLS estimations, we confirm that the relationship between labour productivity and age resembles an inverted U.

While the OLS results for profit margin were not completely unanimous about the influence of the export status, Pooled OLS shows that exporters are more profitable than non-exporters regarding profit margin (and this is statistically significant). Wages per employee continue to present a positive significant coefficient, and employment is insignificant. The results for age show that this variable has a negative (significant) influence on profit margin.

In a nutshell, focusing only on the export status variable, according to the Pooled OLS model, being an exporter leads to an advantage over domestic-oriented firms for both performance measures (productivity and profitability) considered.

Table 9 – Pooled OLS Results (Period 2008-2012)

Independent Variables	Dependent Variables	
	labprod	profmg
exporter	2.559849*	0.7436468*
	[0.1307802]	[0.171678]
	(19.57)	(4.33)
wages_emp	1.835599*	0.1383988*
	[0.0227794]	[0.0204455]
	(80.58)	(6.77)
employ	0.0006873	-0.000871
	[0.0017008]	[0.0017622]
	(0.40)	(-0.49)
age	0.0826972*	-0.0408984*
	[0.031599]	[0.001825]
	(2.62)	(-3.95)
age_sq	-0.0050661*	
	[0.0010163]	
	(-4.99)	
expsize	0.0083884*	0.0015229
	[0.0020609]	[0.001825]
	(4.07)	(0.83)
Intercept	-1.27038*	0.7566562**
	[0.3466472]	[0.3644472]
	(-3.66)	(2.08)
Subsector Dummies	Yes	Yes
R-squared	0.6064	0.0227
F statistic	1,036.63	26.37
Observations	28,580	28,570
Robust	Yes	Yes

Source: Own elaboration based on Stata 12.0.
Note: The values in brackets are the standard errors and in curved parenthesis are the t-statistics. * means significance at 1% level, ** denotes significance at 5% level and *** stands for significance at 10% level. The expression "robust" stands for correction for heteroskedasticity with robust standard errors.

2.4.3. Discussion

Considering both the results of OLS and Pooled OLS models, we can verify that they support our hypotheses. It is unequivocal that firms engaged in exports perform better in terms of productivity. This converges to both our findings in the preliminary descriptive analysis and the conclusions of the majority of the reviewed studies. Regarding profitability, as in the literature, some degree of uncertainty remains: In OLS, besides the export status coefficient being mostly positive and significant, it also

displays a negative sign. Then in the Pooled OLS, export status shows a significant and positive influence (of about 0.7 percentage points).

One of the most unanimous ideas surging from the literature is the existence of an exporter productivity premium (Wagner, 2007). It is understandable since are competing not only with domestic non-exporters in their home market, but also with firms that supply their exports' destination markets. For instance, Bernard *et al.* (2003: 1287) prove "(...) the importance of export costs in segmenting markets, and of efficiency differences across producers in generating heterogeneity in market power, measured productivity, and the ability to overcome geographic barriers". Our results, both from the preliminary descriptive statistics, as from the OLS and Pooled OLS estimations give solid support to our hypothesis that exporters surpass non-exporters regarding their labour productivity. This result was proved with similar methodologies by De Loecker (2007) for Slovenia and ISGEP (2008) for 14 different countries. As Helpman *et al.* (2004) shows, even not being the top players of the market, exporters are among the most efficient companies (being surpassed only by firms engaged in FDI).

Our results from profit margin do not refute our hypothesis. Albeit not presenting a pattern as solid as that of the other measures, it still emerges that exporters are in general more profitable regarding their profit margin. This is coherent with our descriptive analysis and, to some extent, with the literature reviewed. Profitability does not reunite consensus among the authors; yet Melitz (2003), Ruane and Sutherland (2005), Egger and Kreickmeier (2010), Fryges and Wagner (2010) and Kneller and Pisu (2010) show that exporters are more profitable than purely domestic companies (but none with profit margin).

Recalling: our main research question was whether or not exporters substantially differ from non-exporters. In short, basing ourselves on our econometric analysis, the answer is yes: being an exporter *per se* impacts the existence of several premia. This is compatible with findings of several authors, particularly Bernard and Jensen (1995: 88) on their pioneering study of this issue: "The typical exporting plant is much larger, pays higher wages, and is (...) more productive than its nonexporting counterpart".

3. Conclusions, Policy Implications and Avenues for Further Research

The ultimate goal of this paper was to answer what we consider a very relevant research question: Are there significant performance differences between exporters and non-exporters in Portugal? Based on this goal, we started by presenting the findings of extant literature on this theme, and some clear conclusions arose. Firstly, it appears to be a stylized fact that firms engaged in exports have a greater productivity than non-exporters. Still, regarding profitability, although mostly in line with our expectations, is not as evident as the other results.

This led us to explore and ascertain empirically if, in the case of Portugal, there are exporter premia regarding these measures of performance of the enterprises, like Bernard and Jensen did in their pioneering study of these matters in 1995. To fulfil this goal we ran OLS and Pooled OLS regressions for productivity and profitability. The results for productivity are clear: According to our results, it appears that being an exporter has a positive impact in labour productivity. Profitability, while not presenting the most unequivocal results, still confirms our hypotheses and lends some support to that theory that states that, even employing more workers, and paying higher wages per employee, as well as bearing a higher amount of trade costs, exporters can be more profitable than those companies only serving their home market. Even so, it seems that exporters can play an important part in the economic outlook.

Considering the results, some tentative policy implications can be drawn. Since exporters appear to display better results regarding a series of decisive firm-related variables, policymakers should focus on policies to promote exports in Portugal. This is even more important if we take into consideration that Portugal has not fully recovered from its recent economic and financial crisis that led domestic demand to shrink considerably. So, internationalization, notably through exports, can be decisive in making or breaking a firm.

There are plenty of opportunities to develop in future research. For instance, future studies on this theme should address this question regarding other pertinent measures as capital, investment, technology and innovation that as described in our literature review also appear to play an important part in explaining the differences separating exporters from non-exporters. Another opportunity could be to conduct a study consisting of a comparison of firms internationalized through Foreign Domestic Investment and

through exports and those not internationalized. Furthermore, it would be interesting to test if being part of a multinational impacts the difference between exporters and non-exporters.

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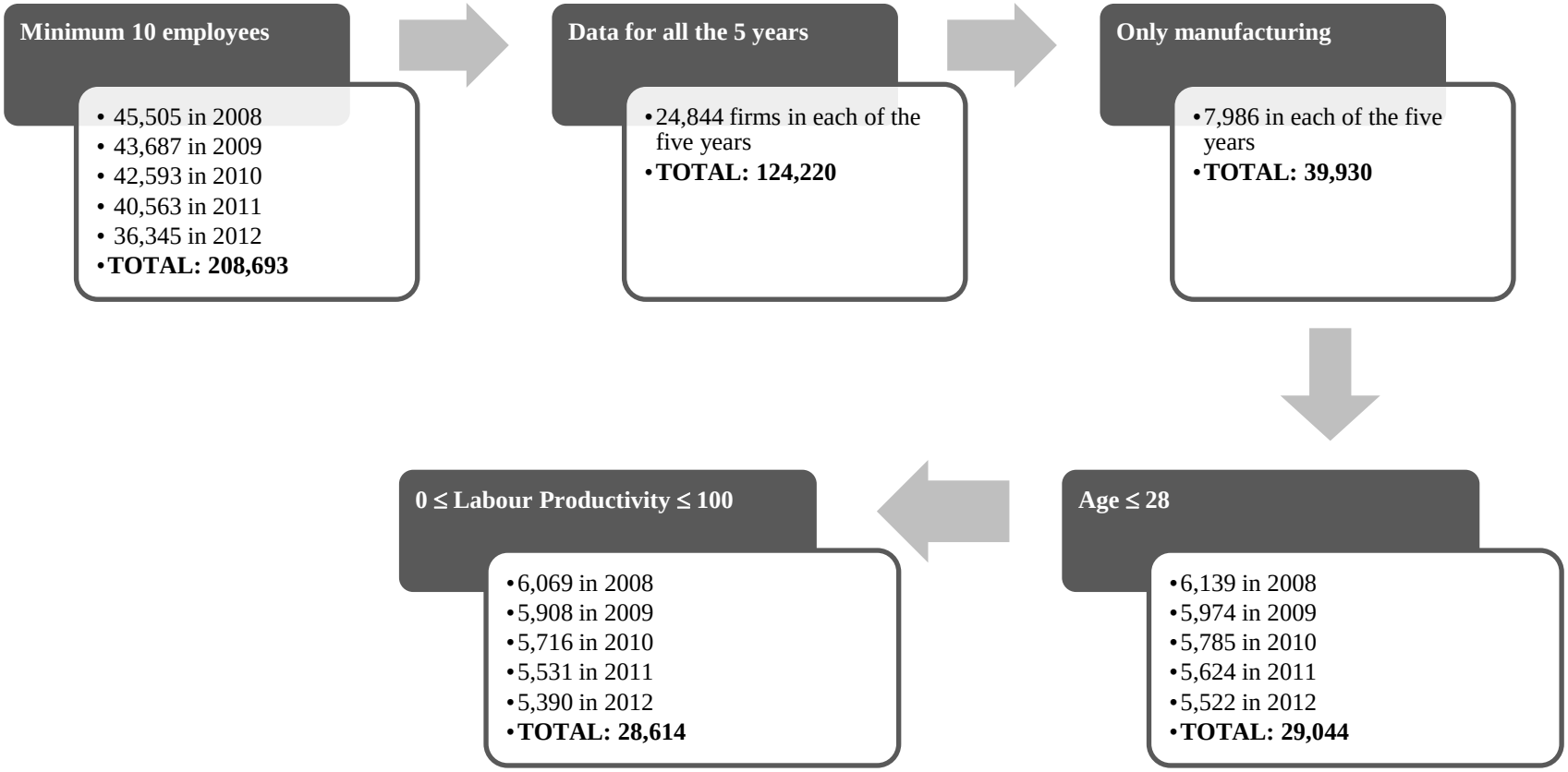
Figure A – Treating process of the data in the sample: phases and number of firms in each step



Source: Own elaboration based on Stata 12.0.

Table A1 – Correlation Matrix

	exporter	labprod	profmg	wages_emp	employ	employ_sq	age	age_sq	expsize
exporter	**1.0000**								
labprod	0.2948*	**1.0000**							
profmg	0.0448*	0.3033*	**1.0000**						
wages_emp	0.2501*	0.7514*	0.0889*	**1.0000**					
employ	0.1813*	0.1757*	0.0160*	0.1413*	**1.0000**				
employ_sq	0.0435*	0.0902*	0.0041	0.0631*	0.8008*	**1.0000**			
age	0.1908*	0.0893*	-0.0113	0.1258*	0.0696*	0.0171*	**1.0000**		
age_sq	0.1853*	0.0752*	-0.0134	0.1144*	0.0677*	0.0133	0.9745*	**1.0000**	
expsize	0.3205*	0.2050*	0.0215*	0.1572*	0.9452*	0.7778*	0.0930*	0.0899*	**1.0000**

Source: Own elaboration based on Stata 12.0.
Notes: * means that the correlation is statistical significant at 1% level.