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SMEs Performance and Internationalization: A Traditional Industry Approach

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This study approaches the internationalization-performance (I-P) relationship following an innovative strategy, using DEA to calculate a financial performance metric that considers several financial indicators. We then apply a truncated regression to evaluate the relationship between financial performance and internationalization for a sample of firms in the footwear Portuguese industry for the period 2010-2013, using several controls, while exploring potential non-linear effects. Results tend to support the conclusion that export participation leads to increased efficiency, eventually through the so-called learning effects. For our case, the relationship is U-shaped. So, beyond a certain level the degree of international engagement might compromise efficiency.

Key Words: Internationalization; Performance; Internationalization-Performance relationship; Data envelopment analysis; Footwear portuguese industry; Financial indicators.

JEL Classification Numbers: C4, F4, G1, M2, O3.

1. INTRODUCTION

All over there is a pro-internationalization discourse, and companies are being impelled to expand beyond their domestic markets — to become international players. Underlying is the argument that internationalization promotes company's performance. On the academic field, the empirical results that exist on the internationalization performance (I-P) effect enhance the importance of internationalization for firm performance, as expressed in Hsu & Pereira (2008) and Assaf et al. (2012), for example, who review

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the literature on the interaction between internationalization and firm performance. Most of the existing literature emphasize that companies exposed to competition in international markets usually perform better than those only operating at domestic level. This effect is likely to be due to self-selection of more efficient firms into exporting or learning-by-exporting (Arnold & Hussinger 2005; Wagner 2007). But the literature also reveals that the I-P effect varies depending on several circumstances internal and external to companies, and also on the performance measure used. The self-selection hypothesis has been confirmed by several studies (Wagner 2007), but the evidence for the inverse relationship is more ambiguous (Fernandes & Isgut 2005; Le & Valadkhani 2014).

Expanding business to foreign countries imply increased competition and management complexity to deal with different labor legislation, business practices, economic and political conditions (Majocchi et al. 2015). Besides a positive linear effect (Caves 1971; Delios & Beamisch 1999), considering the risks associated with internationalization processes, the studies started to consider that the relationship between performance and internationalization might be negative (Ramaswamy 1992), u-shaped (Lu & Beamish 2001), inverted u-shape (Geringer et al. 1989; Hitt et al. 1997) or even s-shaped relationships (Contractor et al. 2002, 2003; Lu & Beamish 2004).

A look at the literature reflects that the I-P effect seems to vary, depending on several circumstances internal and external to companies, and also on the performance measure used. To circumvent this limitation, this study approaches the I-P relationship following an innovative strategy, calculating a unique financial performance metric that considers several financial indicators.

In this study we investigate the I-P relationship in the footwear Portuguese industry, which provides a good setting to address this issue. Our study covers the years of 2010-2013, an exciting economic environment, when Portuguese companies have been further challenged to grow and increase the financial soundness of their businesses against a backdrop of demand and credit rationing. According to the World Footwear Yearbook (2015) Portugal is the 11th largest exporter in the world of shoes, led by China. Traditionally considered as an industry whose competitive advantage stemmed from low production costs, this sector has recently been dubbed by the media as a "success case". Marques (2010) and APICCAPS (2011, 2012, 2014) notice that firms in this industry seem to have been able to surpass abroad strong competition through quality improvement and by increasing value added. Despite the importance of this sector in the Portuguese economy, none of the previous literature focused on the relationship between internationalization and performance in the Portuguese footwear industry. Additionally our study covers the years of 2010-2013, an exciting economic environment, when Portuguese companies have been

further challenged to grow and increase the financial soundness of their businesses against a backdrop of demand, credit rationing and increased competition. In addition to internationalization, we explore the effect of size, age, agglomeration on efficiency. Time (years) is also controlled for.

Previous research focuses mostly over a single accounting measure (profit) to evaluate performance and statistical methods like correlation analysis, regression analysis or vector autoregressive methodologies. This research follows Horta et al. (2016) in terms of methodology by using Data Envelopment Analysis (DEA) which allows considering simultaneously several key performance indicators to construct a relative measure.

The paper develops as follows. Section 2 provides a brief review of previous literature about the effects of internationalization upon financial performance. Section 3 explains the methodology used and section 4 provides information about the data. We report and discuss the results in section 5, while in section 6 we conclude.

2. LITERATURE REVIEW

Exporting is one of the most traditional and significant forms of internationalization. Firms internationalize through exports for several motives. They can internationalize for reactive or proactive motives, due to domestic constraints, to explore foreign market opportunities or ownership specific advantages. It could be argued that firms only internationalize when expected benefits outweigh costs.

Earlier work tends to emphasize that export participation leads to increased efficiency through scale, scope and learning effects. As such, a positive relationship between internationalization and firm financial performance should be expected (Vithessonthi & Racela 2016; Le & Valadkhani 2014).

The dialectic between internationalization for performance has been addressed by several scholars, and bulks of studies investigate the impact of internationalization on firm performance (e.g. Wagner 2007; Singla & George 2013; Xiao et al. 2013; de Jong & van Houten 2014; Le & Valadkhani 2014). Bausch & Krist (2007) review 36 studies published between 1979 and 2004 to find a general positive linear internationalization-performance (I-P) relationship.

One of the key studies on the relative productivity of exporters and non-exporters and on causality between exporting and productivity was conducted by Wagner (2007). An important reason for the positive productivity differential between exporters and non-exporters pertains to the self-selection of more productive plants on export markets. Furthermore, there is evidence for a market-driven selection process in which exporters

that have low productivity fail as successful business units, while only those that are more productive continue to export (Wagner, 2007).

More recently, Tsao & Chen (2012) also find a positive and significant linear relationship between internationalization and financial performance (using return on assets — ROA — and Tobin's Q) of 790 Taiwanese firms from 2000 to 2007. Hsu et al. (2013) and de Jong & van Houten (2014) show that the degree of internationalization is positively related to firm performance. Le & Valadkhani (2014) examine the efficiency performance of exporting versus non-exporting manufacturing small and medium enterprises (SMEs) in Australia for the period 2005-2006 and their results reveal that among firms of the same size and the same industry, non-exporting SMEs tended to have lower efficiency levels compared to their exporting counterparts. Horta et al. (2016) study upon Portuguese and Spanish contractors in the period 2002 to 2011 shows that internationalization had a positive impact on financial performance, although this effect was only statistically significant for Spanish contractors. Not all empirical evidence yield strength to a positive relation between internationalization and performance. Singla & George (2013) and Xiao et al. (2013), for example, found a negative I-P relationship.

About the I-P relationship, there is also empirical evidence of a non-linear relationship. Chiao et al. (2006) found an inverted u-shaped relationship between internationalization (measured by the ratio of export sales to total sales) and performance (return on sales) for 1419 SMEs from Taiwan. Miller et al. (2016) also studied the performance implications of internationalization using a sample of panel Japanese firms to find a u-shaped performance effect generated by international diversity. Elango (2012) finds a quadratic I-P relationship using a sample of 795 companies, accounting for 3 years of data, from the US, Japan, Germany, UK and France. Otherwise, Ruigrok et al. (2007) found an s-shaped relationship, using data from Swiss multinational companies.

Some authors attribute the mixed findings to measurement issues (Sullivan 1994; Goerzen & Beamish 2003), but they also reflect different conceptualizations and theoretical approaches.

In other cases the results are also confusing to interpret. Using a panel sample of non-financial firms in five countries in the Southeast Asia during 1990 and 2014, Vithessonthi (2016) found that the level of internationalization was not associated with firm return on assets. In the same line, in a recent study, Vithessonthi & Racela (2016), who studied a sample of non-financial firms listed on US stock exchanges during 1990-2013, found that the level of internationalization had no effect on ROA but had a positive effect on ROS. The authors hypothesized that the level of internationalization of a firm has a negative effect on operating performance but a positive effect over firm value. Previous literature focus on the relationship between

company performance and internationalization using a single accounting measure like ROA, ROS and Tobin's Q to evaluate performance and apply statistical methods like correlation and regression analysis or even hypotheses testing to identify the nature and direction of the relationship.

Often the results seem to vary accordingly to the measure of performance measure used. This study aims to tackle this limitation in the literature, by using a finance performance index using DEA, based upon usual measures of financial performance like ROA and ROS. Doing so, we follow Horta et al. (2016). Compared to traditional approaches, the methodology proposed has the advantage of using a composite indicator of performance estimated through DEA allowing to consider simultaneously several key financial performance indicators often used individually as representatives of company performance inside the I-P relationship literature.

LaPlante & Paradi (2015) reiterate the value of this synthetic measures, arguing that even banks consider them to objectively identify best practices within organizations (Wu et al. 2006). Despite this, Chen et al. (2015) found very few articles (16) in the management field using this methodology, but hundreds of them using performance measures like return on assets (ROA) or sales (ROS).

Inside frontier efficiency analysis, DEA is one of the most versatile approaches (Paradi & Zhu 2013) and this is the main reason to use it to construct a different performance measurement.

After calculating a measure of financial performance, we apply a truncated regression to evaluate the relationship between financial performance and internationalization. We also explore a potential non-linear effect between performance and internationalization. We use control variables which most likely affect company performance, which are age, size, agglomeration, and time. Using size and age, we explore the liability of smallness and of newness hypotheses. Liability of smallness refers to smaller firms' disadvantages in terms of resources and capabilities, in terms of capital and labor, and higher administrative costs, and thus higher vulnerability to the environmental context (Buckley 1989; Aldrich and Auster 1986). Regarding age, while it may be a proxy for accumulated competencies and experience, favoring performance, is a disquieting reality that while ageing firms' knowledge, competencies and skills may turn obsolete, leading to firm decay (Agarwal and Gort 1996; Aldrich and Auster 1986). In what concerns agglomeration, scholars of agglomeration economies have suggested that clustered firms are likely to benefit from positive externalities deriving from geographic proximity of industry[1]. In this article we explore whether location at centers where there is a higher agglomeration of footwear firms indeed matters.

[1]The concept of clusters of economic activity dates back to Alfred Marshall (1890).

None of the studies available in the literature focused on the relationship between internationalization and performance in the Portuguese footwear industry and using a performance indicator computed through DEA. This study fulfils this gap by identifying aspects associated with firm financial performance in Portugal. This topic is of practical interest given the difficult economic period that this country recently faces, which demanded the adoption of effective strategies to increase the competitiveness in global markets and the footwear industry was one able to surpass the internal market difficulties by expanding sales abroad.

3. METHODOLOGY

First we use a composite indicator of performance estimated with the DEA technique. Second, the effect of internationalization upon financial performance of companies is analyzed, controlling for a set of control variables, using a truncated regression model.

3.1. Efficiency analysis

Charnes et al. (1978) developed the concept of DEA to measure the relative efficiency of a set of decision making units (DMUs) —firms— which use multiple inputs to produce multiple outputs. Reviews can be found in Cook & Seiford (2009) and Seiford (1996). Frontier methods are used to access a firm performance with respect to the industry (Delmas & Tokat 2005; Lieberman & Dhawan 2005), where they represent performance by an efficiency score, estimated directly through observed inputs and output of each individual firm. As such, frontier methods are suitable to conceptualize and measure firm-specific capabilities (Dutta et al. 2005; Chen et al. 2015).

There are two frontier methods. The stochastic frontier approach (SFA) (Aigner et al. 1977; Kumbhakar & Lovell 2003) and the data envelopment analysis (DEA). The latter is nonparametric and the former is a parametric approach (which can lead to numerical problems when estimating the coefficients since SFA relies on maximum likelihood estimation).

The efficiency scores are obtained by solving linear programming problems, enhancing the computational convenience of DEA. This even reduces the risk of model misspecifications. However, the trade-off is that DEA is a deterministic approach and can be sensitive to outliers[2] (Chen et al. 2015).

Composite indicators allow aggregation of sub-indicators to measure multidimensional concepts, usually not captured by a single indicator (OECD 2008; Horta et al. 2016). Recently, Tsolas (2013), Zanella et al. (2013) and

[2]For a more detailed comparison between DEA and SFA applications please see Chen et al. (2015).

Horta el al. (2016) use DEA to estimate composite performance indicators, and DEA is now a standard technique for performance measurement (Kao & Liu 2014; Horta et al. 2016). By using DEA we have the advantage to aggregate a set of key performance indicators into a single overall performance measure (Horta et al. 2016).

Linear programming is used to construct the DEA-based composite indicator and shows each Decision Making Unit (DMU) in its highest performance.

Cherchye et al. (2004) strengthen the use of DEA to estimate composite indicators because their method only look at achievements without explicitly considering resources used, when compared to the more traditional use of DEA to construct composite indicators (Lovell 1995). We follow Cherchye et al. (2004) and Horta et al. (2016) in using a linear programming model to derive the composite indicator for a DMU. Each composite indicator score of DMU is between 0 (worst) and 1 (benchmark).

The performance indicator created allows considering simultaneously several key performance indicators to construct a relative measure of performance by comparison to the best practices actually observed in the sector.

In our study we estimate a DEA score, based on constant returns to scale. The model uses as input variable a dummy variable equal to one for all DMUs (as in Horta et al. 2016) and as output variables the financial ratios. The financial performance index computed through DEA includes as output the financial variables liquidity, leverage, profitability, and activity.

Profitability represents the capacity of a firm to generate profits. As such, we have used the return on assets ratio measured as net profit over total assets to represent how profitable can a company be with respect to its total assets. Activity ratios are financial analysis tools used to measure a business' ability to convert its assets into cash. We have used the current asset turnover measured as the ratio of sales over current assets, indicating how productive the company is using its assets to generate sales. It provides an idea over assets productivity in terms of sales generation. An increase in this ratio through time may mean a better efficiency in the use of companies' assets. The liquidity measure use was the general liquidity ratio measured as current assets over current liabilities (short run). It indicates how short run liabilities are covered by short-run assets (able to be converted into cash). If the ratio is for example 1.25 this means that 125% of short-run responsibilities may be satisfied through cash, inventory and receivables. Finally, solvability indicates the proportion of the assets of the company financed through equity versus those financed by liabilities. The higher the ratio, the greater will be the company financial stability; and the lower it is, the greater the vulnerability. Leverage provides an indication of company long-term solvency. The indicator selected to cover leverage was the solvency ratio. Solvency is defined as the ratio computed as the

shareholders' funds over total assets and represents the proportion of the company's total assets financed by equity.

3.2. Determinants of efficiency

A truncated regression model is estimated through maximum likelihood. This is a useful model to be applied considering that the dependent variable values fit between a lower limit (in our case 0) and an upper limit (which in the current article is 1) in a continuous way.

As dependent variable we considered the firm score estimated through DEA. We considered a number of explanatory variables, being internationalization our focus.

One of the most common variables used to measure company internationalization is the ratio of international revenue to total revenue (Pheng & Hongbin 2003). The variable total exports over sales is used here, which allows to measure the percentage of exports in face to total business volume, is also used by Campa & Shaver (2002) and Gupta et al. (2014) to measure internationalization. Dichotomous variables can also be used to distinguish companies with international activity from those that only operate at national level (Kapelko & Lansink 2013; Manole & Spatareanu 2015; Horta et al. 2016).

Singla & George (2013) argue for the need to integrate the role of organizational characteristics like business group affiliation, firm size and firm age (with positive effect) since they influence the I-P relationship. The age of a firm represents resources that they accumulate over time, as well as difficulties associated, thus depicting the path dependency of these resources. Age allows learning from past experiences and providing more skills to implement their learning in new undertaking, but ageing can also lead to decay in competencies and efficiency. Size also relates to the fact that larger firms have access to a larger amount of resources being a marker of the availability of managerial resources (Dierickx & Cool 1989; Dhanaraj & Beamish 2003; Agarwal and Gort 1996; Aldrich and Auster, 1986). These facts should lead us to expect both age and size to be positively related to efficiency.

We considered firm age, measured as the log of the number of years since establishment, and size.

Company size can be measured as the log of the number of employees (Manole & Spatareanu 2010; Minetti & Zhut 2011; Horta et al. 2016). In our study firm size is measured as the log of the business value amount in a given year like in Vithessonthi & Racela (2016). Growth by internationalization is an important strategic option for both small and large firms (Lu & Beamish, 2001). Sales growth is usually measured as the first difference in the natural log of total sales, being a proxy for firm's growth associated

with assets-in-place or past investment (Vithessonthi 2016). We have also used for robustness check sales growth but results remained unchanged.

We further included a dummy to account for location in regions where there is an agglomeration of footwear firms — regional footwear clusters to certain extant — these are Felgueiras, Oliveira de Azeméis, São João da Madeira and Guimarães. These locations are well known for a high agglomeration of footwear industry firms: Felgueiras, Oliveira de Azeméis and São João da Madeira (APICCAPS, 2012). A dummy variable for each year was also used to account for the time effect.

4. DATA

The data for this study is from the SABI database which is a Bureau Van Dijk database that primarily includes financial information of companies from Spain and Portugal. The final dataset includes 150 small-medium firms (SMEs) from the footwear industry (NACE Rev. 2) for which we had all data needed for the period 2010-2013 (balanced panel). Companies with negative financial indicators were excluded due to the limitations of DEA models, as suggested by Pastor & Ruiz (2007) and Horta et al. (2016). Table 1 presents summary statistics for all variables used.

TABLE 1.

Data descriptive statistics

Variable	Name	Formula	Description	Mean	Std.Dev.	Min	Max
P	Profitability ratio	$ROA = LR/A$	ROA: Return on assets; LR: Liquid Result or net profit; A: Total Assets	0,0563	0,0562	0,0002	0,3000
L	Liquidity ratio (L)	$L = CA/CL$	CA: current assets; CL: current liabilities (short run)	21,786	18,185	0,3686	151,020
S	Solvency ratio	$S = E/A$	E: Equity or shareholders' funds; A: Total assets	0,3853	0,2072	0,0285	0,9088
A	Activity ratio (A)	$A = S/CA$	S: Total Sales; CA: Current Assets	20,478	10,200	0,2581	70,665

TABLE 1—*Continued*

Variable	Name	Formula	Description	Mean	Std.Dev.	Min	Max
LVN	Log Business Sales in million euros	$\ln(VN)$	Log of total Business Sales (VN)	69,804	16,400	31,781	114,214
EV	Ratio of export sales over total sales	$EV = Ex/S$	EV: Export Intensity ratio; Ex: Exports; S: Total Sales	0,3749	0,4249	0,0000	10,000
EV2	Ratio of export sales over total sales squared	$EV2 = (EV)^2$	Square of export intensity ratio	0,3208	0,3951	0,0000	10,000
LAGE	Log number of years since establishment	$\ln(AGE)$	AGE: Difference in years between the numbers of years since establishment and the current analysis year	27,615	0,8212	0,0000	43,567
TD2013	Time dummy		1 if in 2013 and 0 otherwise	n.a	n.a	0,0000	10,000
TD2012	Time dummy		1 if in 2012 and 0 otherwise	n.a	n.a	0,0000	10,000
TD2011	Time dummy		1 if in 2011 and 0 otherwise	n.a	n.a	0,0000	10,000
TD2010	Time dummy		1 if in 2010 and 0 otherwise	n.a	n.a	0,0000	10,000
FLG	Felgueiras location dummy;		1 if in Felgueiras and 0 otherwise	n.a	n.a	0,0000	10,000
OA	Oliveira de Azeméis location dummy		1 if in Oliveira de Azeméis and 0 otherwise	n.a	n.a	0,0000	10,000

In our sample, footwear industry companies perform better with respect to liquidity and activity ratios. The export intensity ratio has a mean of 37.5% and a volatility of 42.5%. The average age years of firms in terms of

TABLE 1—*Continued*

Variable	Name	Formula	Description	Mean	Std.Dev.	Min	Max
SJM	São João da Madeira location dummy		1 if in São João da Madeira and 0 otherwise	n.a	n.a	0,0000	10,000
GM	Guimarães location dummy;		1 if in Guimarães and 0 otherwise	n.a	n.a	0,0000	10,000
Total number observations pooled = 600							

years outstanding in the market surrounds 21 years, with the highest value being reported of 78 years, and the lowest of 1 year in the market, with respect to the base year (2013, 2012, 2011 or 2010).

TABLE 2.

Percentage of firms by location

	FLG	OA	SJM	GM	Other
Obs.	140	168	92	40	160
% of firms	23,3	28	15,3	6,7	26,7

The total number of observations in the pooled sample is 600, comprising data of 150 firms within the footwear industry. Observations (Obs.) is the number of observations available for each city and N° firms is the number of firms considered in each city. In total we have 76 exporting companies and 74 non-exporting.

It is visible from table 2 that in our sample there is a higher agglomeration of firms in Felgueiras and Oliveira de Azeméis.

5. RESULTS

5.1. Financial performance assessment

The first stage of the assessment was intended to assess the financial performance level of footwear companies in Portugal. The performance score for each company in each year was estimated based on a comparison with a pooled frontier representing the best practices observed in the 3 years analyzed. We further estimate performance considering a DEA model with CRS as this provides a measure of overall financial performance and we are interested in this rather than in other components. Table 4 reports the average of the original CRS efficiency scores, the standard deviations, and the lower upper limits in each year analyzed.

From Table 3 we can verify that the results point to a low efficiency level during the period analyzed (average of 58.3%). It is also important to note that the performance levels improved over the years. In particular, from 2010 to 2013 the results indicate a performance increase of approximately 7,3%, in spite of the slight decline in 2012.

From table 3 it is possible to observe that the lowest score for our pooled sample stands for 9,6% and the highest for 100%. The number of companies in the pooled sample whose efficiency performance index computed through DEA points for 100% efficient was 15.

The gap between good and bad performers was higher in 2012, which indicate that in that year companies were more heterogeneous in terms of financial performance.

TABLE 3.

Financial performance scores

Variable	Financial Performance	Std. Dev.	Min	Max
All	0.583	0.193	0.096	1.000
2013	0,601	0.194	0.119	1.000
2012	0,584	0.199	0.097	1.000
2011	0,586	0.189	0.096	1.000
2010	0,560	0.194	0.161	1.000

Next we explore some factors that potentially explain the spread in the performance levels observed during the period analyzed. In particular, we analyze the effect of company internationalization, location and on the efficiency levels.

TABLE 4.

Financial performance results by year, and by type of firm

	All	Exporters				Non-Exporters			
		Average	s.d	Min	Max	Average	s.d	Min	Max
2013-2010	0,5827	0,5989	0.1842	0.2553	1.0000	0,5662	0.2031	0.0959	1.0000
2013	0,6010	0,6259	0.1879	0.2611	1.0000	0,5755	0.1984	0.1192	1.0000
2012	0,5839	0,6042	0.1892	0.2553	1.0000	0,5630	0.2081	0.0972	1.0000
2011	0,5857	0,5939	0.1774	0.2589	1.0000	0,5773	0.2020	0.0959	1.0000
2010	0,5603	0,5715	0.1815	0.2907	0.9906	0,5489	0.2068	0.1617	1.0000

Table 4 reports the results of the performance indicator index means by type of firm (exporters / non-exporter), and by location (table 5) for the years under analysis. Table 4 shows that on average performance is higher for exporters than non-exporter companies, and the lag between them in-

creased over the time period. Indeed, the performance levels improved over the years for both groups, but the increase has been higher for exporters. In particular, from 2010 to 2013 the exporters results indicate a performance increase of approximately 9,5%, while non-exporters registered an increase of only 4,8%. Hence, exports might have smoothed the effects of the recent crisis.

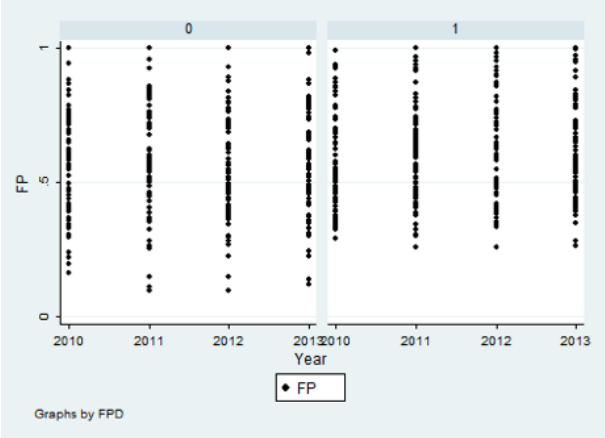
TABLE 5.

Financial performance results by location and year

	All	FLG	AO	SJM	GM
2013-2010	0,5802	0,5828	0,5823	0,5791	0,5836
2013	0,5981	0,6019	0,5996	0,5970	0,6022
2012	0,5808	0,5836	0,5834	0,5827	0,5876
2011	0,5840	0,5861	0,5847	0,5831	0,5882
2010	0,5578	0,5598	0,5614	0,5535	0,5565

The decomposition of the pooled performance also shows that the cluster 'exporter companies' have different performance profiles, being that these operate closer to the industry pooled frontier. There is higher asymmetry within non-exporters (higher s.d. also), with a few companies located at the top end and a few others at the low end (Graph 1). This means that the gap between good and bad performers is higher within non-exporters, which indicate that these groups of companies were more heterogeneous in terms of financial performance.

FIG. 1. Financial Performance (o: non exporters; 1: exporters)



When considering location (table 5), the results do not reveal significant differences. Firms located at centers where there is a higher agglomeration

of the footwear industry do not show significantly different performance levels.

In the next section we explore with more detail the determinants of financial performance.

5.2. Determinants of Financial performance

The purpose of this section is to explore the determinants of financial performance. In particular, we explore the impact of the degree of internationalization, company size and company age, and location at certain centers. The regression model specified is a panel data truncated model, with the bias corrected financial performance measure used as dependent variable and the other variables referred above (age, size and location), as well as time dummies, as independent variables. Initially we conducted pairwise correlations between variables. The results are presented in table 6. Given the lower values presented through correlations, multicollinearity does not represent a problem within our estimates.

TABLE 6.

Pairwise correlations

	FP	LVN	EV	LAGE
FP	1			
LVN	0.1300^{***}	1		
EV	0.1323^{***}	0.7527^{***}	1	
LAGE	0.0037^{**}	0.4446^{***}	0.4346^{***}	1
TD2013	0.0544	0.0440	0.0077	0.0817^{**}
TD2012	0.0034	0.0135	0.0094	0.0250
TD2011	0.0088	−0.0105	−0.0026	−0.0445
TD2010	−0.0666	−0.0470	−0.0145	−0.0628
FLG	-0.1556^{***}	0.1966^{***}	0.1502^{***}	-0.1059^{*}
AO	−0.0031	-0.4035^{***}	-0.2854^{***}	−0.0571
SJM	0.0499	0.0365	0.1355^{***}	0.1510^{***}
GM	0.0096	−0.0273	−0.0288	−0.0274
CFOS	-0.1044^{**}	-0.1800^{***}	−0.0335	−0.0343

Variables descriptions are presented in table 1. The total number of observations in the pooled sample is 600, comprising data of 150 firms within the footwear industry. *, **, *** correspond to 10%, 5% and 1% significance levels.

To analyze the effects of internationalization on the financial performance of footwear industries we have computed several regressions for robustness check. Table 7 reports the coefficient estimates from the panel data truncated model.

TABLE 7.

Truncated regressions pooled estimation results

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
EV	0.0730^{***}	-0.1868^{*}	-0.2688^{***}	-0.2643^{**}	-0.2690^{**}
EV2		0.2850^{**}	0.3310^{***}	0.3288^{***}	0.3387^{**}
LVN			0.0186^{**}	0.0222^{***}	0.0259^{***}
LAGE			-0.0121	-0.0159	-0.0266^{**}
TD2013				0.0427^{**}	0.0437^{*}
TD2012				0.0244	0.0256
TD2011				0.0369	0.0368
FLG				-0.0966^{***}	
OA					0.0054
SJM					0.0012
GUI					-0.0067
Wald chi2(2)	21.92	17.73	26.86	25.40	93.54
$Prob > chi2$	0,0000	0,0001	0,0000	0,0006	0.0000

The total number of observations in the pooled sample is 600, comprising data of 150 firms within the footwear industry. *, **, *** correspond to 10%, 5% and 1% significance levels. All models have been estimated with constant and considering bootstrap standard errors. Variables descriptions are found in table 1.

The results are consistent with previous internationalization performance relationship studies which argue in favor for the existence of a u-shaped relationship (Lu & Beamish, 2001; Yang & Driffield, 2012; Miller et al., 2016). In model 1 the degree of internationalization reveals positive and significant. However, accounting for non-linear effects (including the squared exports intensity ratio), results point for a u-shaped I-P relationship. The result holds even when we add other variables, namely age, size, time dummies and location at certain centers.

Company internationalization is related to performance nonlinearly, as both the first and the second order coefficients are statistically significant. It is found a U-shaped relationship between performance and export intensity. In particular, performance first decreases as company export intensity increases, and after a certain export intensity ratio performance starts to increase as export intensity further increases. This observation is consistent with the results of other studies analyzing the I-P relationship and raises important implications for both short and long-term decisions taken by both companies and investors.

There is a significant positive effect of size, giving support to the existence of liability of smallness, which refers to smaller firms' disadvantages in terms of resources and capabilities. Otherwise, age reveals a negative and significant sign, meaning that age penalizes financial performance, giving

voice to the arguments that with age knowledge and competencies may become obsolete, leading to firm decay (Agarwal and Gort 1996).

The location in specific centers reveals negative and significant for Felgueiras, and not significant for the others. Results seem to indicate that firms located at these locations do not have better financial performance. The results of this study suggest that the enthusiasm for agglomeration economies may need to be tempered.

6. CONCLUSION

A consensus of the often-observed positive correlation between firm's export activities and performance seems to have emerged. Our results are generally in line with this view and are consistent with the results of other studies analyzing the I-P relationship. The results tend to support the conclusion that export participation leads to increased efficiency, eventually through the so-called learning effects. Nonetheless, for our case, the relationship is U-shaped. Beyond a certain level the degree of international engagement might compromise efficiency. We should further explore the reasons behind this fact.

Our results also raise concerns about the performance of footwear firms located in Portuguese traditional footwear regional clusters. The negative effect found regarding location at those locations deserves further research. Moreover, we should further explore if internationalization induces indeed efficiency or if, alternatively, relatively efficient firms self-select into export activities as suggested by other authors (Le & Valadkhani, 2014). In this case, then it would not be export participation, per se, that would make a firm more efficient, but rather efficiency that would cause export participation. Le & Valadkhani (2014) argue that if this is the case, different policies should be used, ('different than if the learning-effects hypothesis holds').

Apart from traditional pro-internationalization measures, which have been found useful, probably reducing the entry costs and hence facilitating entry of new firms (Torres et al., 2016), there is a need to promote efficiency, otherwise firms will not be able to compete in global markets. Portuguese firms can achieve this goal by investing in continuously in critical competitiveness factors, such as human capital, ICT, e-commerce, financial planning, innovation and product differentiation.

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REFERENCES

Aigner, Dennis, C. A. Lovell, and P. Schmidt, 1977. Formulation and estimation of stochastic frontier production function models. *Journal of Econometrics* **6(1)**, 21-37.

Aldrich, Howard and E. R. Auster, 1986. Even dwarfs start small: Liabilities of age and size and their strategic implications. In Staw and Cummings (eds.) Research in Organizational Behavior, JAI Press, 8, 165-198.

Agarwal, Rajshree and M. Gort, 1996. The evolution of markets and entry, exit and survival of firms. *Review of Economics and Statistics* **78(3)**, 489-498.

Arnold, Jens Matthias and K. Hussinger, 2005, Export behavior and firm productivity in German manufacturing: A firm-level analysis. *Review of World Economy* **141(2)**, 219-243.

APICCAPS, 2011. Footwear, Components and Leather Goods — Statistical Study. APICCAPS — Associação Portuguesa dos Industriais de Calçado, Componentes, Artigos de Pele e seus Sucedâneos, 1-79. https://www.apiccaps.pt/publications/monografia-estatistica/112.html

APICCAPS, 2012, World Footwear 2012 yearbook, APICCAPS, 1-88. https://www.worldfootwear.com/store.asp?id=3&Yearbook_2012_Electronic__paper_book_version

APICCAPS, 2014. Monografia estatística: calçado, componentes e artigos de pele. Available at: http://www.apiccaps.pt/c/document_library/get_file?uuid=6dec520c-c072-4159-af11-9513cf060f2e&groupId=10136

Assaf, A. George, A. Josiassen, B. T. Ratchford, and C. P. Barros, 2012. Internationalization and Performance of Retail Firms: A Bayesian Dynamic Model. *Journal of Retailing* **88(2)**, 191-205.

Bausch, Andreas and Mario Krist, 2007. The effect of context-related moderators on the internationalization-performance relationship: evidence from meta-analysis. *Management International Review* **47(3)**, 319-347.

Campa, Jose and J. Myles Shaver, 2002. Exporting and capital investment: On the strategic behavior of exporters. IESE Business School, University of Navarra. IESE Research Papers *N°* 469. Available at: https://core.ac.uk/download/files/153/6536338.pdf

Caves, Richard E., 1971. International Corporations: The Industrial Economics of Foreign Investment. *Economica* **38(149)**, 1-27.

Charnes, A, W. W. Cooper, and E. Rhodes, 1978. Measuring the efficiency of decision making units. *European Journal of Operational Research* **2(6)**, 429-444.

Chen, Chien-Ming, Magali A. Delmas, and Marvin B. Lieberman, 2015. Production frontier methodologies and efficiency as a performance measure in strategic management research. *Strategic Management Journal* **36(1)**, 19-36.

Cherchye, Laurens, Wim Moesen, and Tom Van Puyenbroeck, 2004. Legitimately Diverse, yet Comparable: On Synthesizing Social Inclusion Performance in the EU. *Journal of Common Market Studies* **42(5)**, 919-955.

Chiao, Yu-Ching, Kuo-Pin Yang, and Chwo-Ming Joseph Yu, 2006. Performance, internationalization, and firm specific advantages of SMEs in a newly-industrialized economy. *Small Business Economics* **26(5)**, 475-492.

Contractor, Farok J., Sumit K. Kundu, and Chin-Chun Hsu, 2002. A three-stage theory of international expansion: the link between multinationality and performance in the service sector. *Journal of International Business Studies* **34(1)**, 5-18.

Contractor, Farok J.,Sumit K. Kundu, and Chin-Chun Hsu, 2003. A three-stage theory of international expansion: The link between multinationality and performance in the service sector. *Journal of International Business Studies* **34**, 5-18.

Cook, Wade D. and Larry M. Seiford, 2009. Data envelopment analysis (DEA) — thirty years on. *European Journal of Operational Research* **192(1)**, 1-17.

de Jong, Gjalt and Jerry van Houten, 2014. The impact of MNE cultural diversity on the internationalization-performance relationship: theory and evidence from European multinational enterprises. *International Business Review* **23(1)**, 313-326.

Delios, Andrew and Paul W. Beamish, 1999. Geographic scope, product diversification and the corporate performance of Japanese firms. *Strategic Management Journal* **20(8)**, 711-727.

Delmas, Magali and Yesim Tokat, 2005. Deregulation, governance structures, and efficiency: the US electric utility sector. *Strategic Management Journal* **26(5)**, 441-460.

Dhanaraj, Charles and Paul W. Beamish, 2003. A resource-based approach to the study of export performance. *Journal of Small Business Management* **41(3)**, 242-261.

Dierickx, Ingemar and Karel Cool, 1989. Asset stock accumulation and sustainability of competitive advantage. *Management Science* **35(12)**, 1504-1511.

Dutta, Shantanu, Om Narasimhan, and Surendra Raji, 2005. Conceptualizing and measuring capabilities: methodology and empirical application. *Strategic Management Journal* **26(3)**, 277-285.

Elango, B., 2012. How industry dynamics influence the internationalization-performance relationship: evidence from technology-intensive firms. *Thunderbird International Business Review* **54(5)**, 653-665.

Fernandes, Ana M. and Alberto E. Isgut, 2005. Learning-by-Doing, Learning-by-Exporting, and Productivity: Evidence from Colombia. Policy Research Working Paper; No. 3544. World Bank, Washington, DC. World Bank. https://openknowledge.worldbank.org/handle/10986/8975

Geringer, Michael J., Paul W. Beamish, and Richard Dacosta, 1989. Diversification strategy and internationalization: Implications for MNE performance. *Strategic Management Journal* **10(2)**, 109-119.

Goerzen, Anthony and Paul W. Beami, 2003. Geographic scope and multinational enterprise performance. *Strategic Management Journal* **24(13)**, 1289-1306.

Gupta, Jairaj, Nicholas Wilson, Andros Gregoriou, and Jerome Healy, 2014. The effect of internationalisation on modelling credit risk for SMEs: Evidence from UK market. *Journal of International Financial Markets, Institutions and Money* **31**, 397-413.

Hitt, Michael A., Robert E. Hoskisson, and Hicheon Kim, 1997. International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management Journal* **40(4)**, 767-798.

Horta, Isabel M.,Magdalena Kapelko, Alfons Oude Lansink, and Ana S. Camanho, 2016. The impact of internationalization and diversification on construction industry performance. *International Journal of Strategic Property Management* **20(2)**, 172-183.

Hsu, Chin-Chun and Arun Pereira, 2008. Internationalization and performance: The moderating effects of organizational learning. *Omega* **36(2)**, 188-205.

Hsu, Wen-Tsung, Hsiang-Lan Chen, and Chia-Yi Cheng, 2013. Internationalization and firm performance of SMEs: the moderating effects of CEO attributes. *Journal of World Business* **48(1)**, 1-12.

Kao, Chiang and Shiang-Tai Liu, 2014. Multi-period efficiency measurement in data envelopment analysis: The case of Taiwanese commercial banks. **Omega 47**, 90-98.

Kapelko, Magdalena and Alfons Oude Lansink, 2013. Technical Efficiency of the Spanish Dairy Processing Industry: Do Size and Exporting Matter? In Mendes, A. B., Silva, E. L. D. G. S. d., and Santos, J. M. A., editors, Efficiency Measures in the Agricultural Sector, pp. 93-106. Springer Netherlands.

Kumbhakar, Subal C. and C. A. Knoxx Lovell, 2003. Stochastic Frontier Analysis', Cambridge University Press: New York.

LaPlante, A. E. and J. C. Paradi, 2015. Evaluation of bank branch growth potential using data envelopment analysis. *Omega*, **52**, 33-41.

Le, Viet and Abbas Valadkhani, 2014. Are exporting manufacturing SMEs more efficient than non-exporting ones? Evidence from Australia's business longitudinal database. *Economic Analysis and Policy* **44(3)**, 310-317.

Lieberman, Marvin B. and Rajeev Dhawan, 2005. Assessing the resource base of Japanese and U.S. auto producers a stochastic frontier production function approach. *Management Science* **51(7)**, 1060-1075.

Lovell, C. A. Knox, 1995. Measuring the macroeconomic performance of the Taiwanese economy. *International Journal of Production Economics* **39(1-2)**, 165-178.

Lu, Jane W. and Paul W. Beam, 2001. The internationalization and performance of SMEs. *Strategic Management Journal* **22(6-7)**, 565-586.

Lu, Jane W. and Paul W. Beam, 2004. International diversification and firm performance: The *s*-curve hypothesis. *Academy of Management Journal* **47(4)**, 598-609.

Majocchi, Antonio, Luciana Dalla Valle, and A. D'Angelo, 2015. Internationalisation, cultural distance and country characteristics: a Bayesian analysis of SMEs financial performance. *Journal of Business Economics and Management* **16(2)**, 307-324.

Manole, Vlad and Mariana Spatareanu, 2010. Exporting, capital investment and financial constraints. *Review of World Economics* **146(1)**, 23-37.

Manole, Vlad and Mariana Spatareanu, 2015. Investment climate, foreign networks and exporting — evidence from Africa. *International Review of Applied Economics* **29(3)**, 349-373.

Marques, Walter Anatole, 2010. Portugal no Mundo do Calçado. Boletim Mensal de Economia Portuguesa. Gabinete de Estratégia e Estudos, 43-53. ISSN: 1646-9062

Marshall, Alfred, 1890. Principles of economics. London: Macmillan.

Miller, Stewart R., Dovev Lavie, and Andrew Delios, 2016. International intensity, diversity, and distance: Unpacking the internationalization-performance relationship. *International Business Review* **25(4)**, 907-920.

Minetti, Raoul and Susan Chun Zhu, 2011. Credit constraints and firm export: Microeconomic evidence from Italy. *Journal of International Economics* **83(2)**, 109-125.

OECD, 2008. Handbook on Constructing Composite Indicators: Methodology and User Guide. OECD publishing edition.

Paradi, Joseph C. and Haiyan Zhu, 2013. A survey on bank branch efficiency and performance research with DEA. *Omega*, **41(1)**, 61-79.

Pastor, Jesús T. and José L. Ruiz, 2007. Variables with negative values in Dea. In: Zhu J., Cook W.D. (eds) Modeling Data Irregularities and Structural Complexities in Data Envelopment Analysis. Springer, Boston, MA, 63-84.

Pheng, Low Sui and Hongbin Jiang, 2003. Internationalization of Chinese Construction Enterprises. *Journal of Construction Engineering and Management* **129(6)**, 589-598.

Ramaswamy, K., 1992. Multinationality and Performance: A Synthesis and Redirection. *Advances in International Comparative Management* **7(1)**, 241-267.

Ruigrok, Winfried, , Wolfgang Amann and Hardy Wagner, 2007. The internationalization-performance relationship at Swiss firms: a test of the S-shape and extreme degrees of internationalization. *Management International Review* **47(3)**, 349-368.

Seiford, Lawrence M., 1996. Data envelopment analysis: the evolution of the state of the art (1978-1995). *Journal of Productivity Analysis* **7(2-3)**, 99-138.

Singla, Chitra and Rejie George, 2013. Internationalization and performance: a contextual analysis of Indian firms. *Journal of Business Research* **66(12)**, 2500-2506.

Sullivan, Daniel, 1994. Measuring the degree of internationalization of a firm. *Journal of International Business Studies* **25(2)**, 325-342.

Torres, Miguel Matos, L. Jeremy Clegg, and Celeste Amorim Varum, 2016. The missing link between awareness and use in the uptake of pro-internationalization incentives. *International Business Review* **25(2)**, 495-510.

Tsao, Shou-Min and Guang-Zheng Chen, 2012. The impact of internationalization on performance and innovation: the moderating effects of ownership concentration. *Asia Pacific Journal of Management* **29(3)**, 617-642.

Tsolas, I. E., 2013. Construction project monitoring by means of RAM-based composite indicators. *Journal of the Operational Research Society* **64(8)**, 1291-1297.

Vithessonthi, Chaiporn, 2016. Capital investment, internationalization, and firm performance: Evidence from Southeast Asian countries. *Research in International Business and Finance* **38**, 393-403.

Vithessonthia, Chaiporn and Olimpia C. Racela, 2016. Short- and long-run effects of internationalization and R&D intensity on firm performance. *Journal of Multinational Financial Management* **34**, 28-45.

World Footwear Yearbook, 2015. World Footwear Analysis. APICCAPS, www.worldfootwear.com.

Wagner, Joachim, 2007. Exports and Productivity: A Survey of the Evidence from Firm-level Data. *The World Economy* **30(1)**, 60-82.

Wu, Desheng Dash, Zijiang Yang, and Liang Liang, 2006. Efficiency analysis of cross-region bank branches using fuzzy data envelopment analysis. *Applied Mathematical Computation* **181**, 271-281.

Xiao, Simon Shufeng, Insik Jeong, Jon Jungbien Moon, Chris Changwha Chung and Jaiho Chung, , 2013. Internationalization and performance of firms in China: moderating effects of governance structure and the degree of centralized control. *Journal of International Management* **19(2)**, 118-137.

Zanella, A., A. S. Camanho, and T. G. Dias, 2013. Benchmarking countries' environmental performance. *Journal of the Operational Research Society* **64(3)**, 426-438.