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## SMEs INNOVATION CAPABILITIES AND EXPORT PERFORMANCE: AN ENTREPRENEURIAL ORIENTATION VIEW

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**Abstract.** Although there are several studies analysing how innovation capabilities influence export performance, this study aims to present the impact of a set of internal innovation capabilities on export performance of small and medium-sized firms (SMEs), with the mediating role of entrepreneurial orientation contingent upon the proactive or reactive behaviour of the firms to external stimuli. The study involves the analysis of 147 questionnaire-based survey of managers from plastic manufacturing SMEs operating in Portugal that were subjected to a Partial Least Squares-Structural Equation Modelling (PLS-SEM) technique. The results show that proactive firms to external stimuli are not only better at innovating but also their entrepreneurial orientation capabilities underpin a better performance in international markets when compared with firms that react to external stimuli. This study has implications for SMEs aiming at increasing their export performance and innovativeness. For practitioners the findings of this study should enable SMEs owner/managers to better understand the possible impacts of innovation capabilities and entrepreneurial orientation on export performance, and thus lead to more effective SMEs management.

**Keywords:** innovation capabilities, export performance, entrepreneurship orientation, SMEs, proactive behaviour, reactive behaviour.

**JEL Classification:** M16, L26, O32.

### Introduction

Internationalisation and innovation are important for small and medium-sized firms (SMEs) (Golovko, Valentini 2011). The literature relating internationalisation and performance is vast (Guan, Ma 2003; Zucchella, Siano 2014; Lohrke *et al.* 2015; Oura *et al.* 2016; Ribau *et al.* 2017). However, Ruigrok and Wagner (2003) suggest there is a positive relationship between them, and emphasise the need for further studies.

Few empirical studies report a positive relationship between firm-related innovation capabilities and export performance on SMEs (Guan, Ma 2003; Garcia-Morales *et al.* 2006; Oura *et al.* 2016). Lages *et al.* (2009) focused on the influence of a set of innovation capabilities on product strategy and export performance. Meliá *et al.* (2010) studied the influence of innovation orientation on the internationalisation of service-based SMEs. Lisboa *et al.* (2011) analysed how innovative capabilities influence performance. Finally, Guan and Ma (2003) conclude that innovation capabilities not only influence the export ratio of manufacturing firms in several industries, but also that export growth is related to the improvement of innovation capabilities.

Entrepreneurial orientation (EO) influences how firms discover and exploit market opportunities. EO affects a firm's strategic orientation and decision-making style, practices and methods, and can be viewed as a combination of proactiveness, innovativeness and risk-taking behaviour (Miller, Friesen 1983; McDougall, Oviatt 2000; Lee *et al.* 2001) with autonomy and competitive aggressiveness (Lumpkin, Dess 1996) in order to obtain and sustain competitive advantage.

The literature on how SMEs venture abroad is extensive (Ribau *et al.* 2017). SMEs may react to unsolicited export orders as a means of shortening the firm's export development process (Katsikeas 1996; Bell *et al.* 2003), which is a common response to environmental pressures (e.g. pressure from competitors, decreases in domestic sales, excess capacity, overproduction, proximity to customers), whereas proactive motivations are based on management choices to expand the business to an international level based on the firm's competitive advantage (Bell *et al.* 2003; Verisan, Achimescu 2011).

The main objective of this paper is to examine how internal innovation capabilities influence the export performance of SMEs. Taking into account the importance of EO (Lee *et al.* 2001), this study seeks to complement previous studies and analyse how EO mediates the innovation-export performance relationship taking into account two different perspectives that are common among SMEs: the influence of external stimuli in their proactive and reactive behaviour in the internationalisation process (Westhead *et al.* 2004). It is expected that EO of proactive SMEs has a more pervasive influence than that of reactive SMEs in the relationship between innovation capabilities and export performance.

Previous studies analyse the relationship between innovation capabilities and export performance in industrial SMEs from a wide range of sectors (Guan, Ma 2003; Oura *et al.* 2016). This paper focuses on SMEs of the plastic industry in Portugal, which is characterised by an average export intensity of 56%, between 2010 and 2014, and by a strong innovation capacity.

The paper is organised as follows. The hypotheses are developed in the first section, which presents the theoretical background for firm-related innovation capabilities, covering the relationship between EO, innovation capabilities and export performance. The second section presents the research method, followed by the third section which presents the results. The article ends with conclusions and a review of its limitations and future research paths.

## 1. Theoretical background and hypothesis development

Innovation represents one of the main avenues for building firm-specific advantages (Zucchella, Siano 2014), growth (Guan, Ma 2003; Oura et al. 2016) and high performance levels (Garcia-Morales et al. 2006). Innovation capabilities are an important source of competitive advantage of the firm (Guan, Ma 2003; Zahra et al. 2006), underpinning (a) the firms innovation and new product development capacity, and (b) the deployment of new managerial and production processes.

Innovative capabilities are recognised as a major driver of firm growth (Teece et al. 1997), which is little explored in the literature on exports among SMEs (Lisboa et al. 2011; Oura et al. 2016). Business growth and success depend on the joint effect of internationalisation and innovation (Onetti et al. 2010).

The importance of innovation is not new. Eriksson et al. (2000) address the importance of knowledge accumulation in the firms' internationalisation process. Barrios et al. (2003) found that R&D activity is an important determinant of export activity. Hortinha et al. (2011) claim that technological innovation influences export performance. However, Filipescu et al. (2013) found that innovation and exports have a reciprocal causal relationship. Literature reports a positive relationship between firms' technological innovation and exporting activities (López, García 2005; Filipescu et al. 2013). Moreover, it is not new that innovative firms have a strong tendency to enter foreign markets (Hortinha et al. 2011) and are able to generate and exploit their innovations in international markets (Zahra et al. 2000).

Innovative firms are not only capable of developing new capabilities, technologies and processes, but also able to transform resources and redesign processes and structures to enter new international markets (Meliá et al. 2010).

The literature on innovation-performance relationship has focused on technology, product development capabilities and R&D activities (Lumpkin, Dess 1996; Salomon, Shaver 2005; Lisboa et al. 2011). However, innovation is also related to marketing and organisational capabilities (Gunday et al. 2011), requiring the combination of more than one of these capabilities for firms to internationalise successfully (Guan, Ma 2003; Oura et al. 2016). It is clear that investments in technological resources enhance organisational knowledge and learning capabilities, which influence the firm's capability to develop competitive advantages to compete abroad (Eriksson et al. 2000; Meliá et al. 2010; Guan, Ma 2003; Oura et al. 2016). It is clear that, innovative firms have strong capabilities that underpin their expansion international markets to earn higher returns from their technological investments.

One common aspect is that most of the studies do not cover specifically SMEs. Moreover, in this research, we extend the domain of innovation capabilities to other aspects. Capabilities are a set of special assets, skills and knowledge that, over time, become firms' routines and practices and enable them to use resources efficiently and achieve superior performance (Teece et al. 1997; Guan, Ma 2003; Gunday et al. 2011; Oura et al. 2016). As such, based on the work of Guan and Ma (2003) and Oura et al. (2016),

this article explores the concept of innovation capabilities, based on the following seven dimensions: (1) learning capability; (2) R&D capability; (3) manufacturing capability; (4) marketing capability; (5) organisational capability; (6) resources exploiting capability; and (7) strategic capability.

EO literature has been marked by innovation as a central aspect. EO is a key organisational capability that assists entrepreneurs/managers in identifying and exploiting opportunities in international markets (Kocak, Abimbola 2009). EO can be considered an intangible organisational resource in which firms need to invest to cultivate such entrepreneurial culture (Lee *et al.* 2001). As such, EO is a firm attitude with consequences for activities of the firm.

EO provides SMEs the ability to identify new opportunities, which differentiates them from other firms in the way they compete (Wiklund, Shepherd 2005; Kraus *et al.* 2012) and in the way they seek potential rewards (Kropp *et al.* 2006). International EO involves a proactive approach to identifying overseas markets, and is linked to managers' global vision and competitive posture (Covin, Miller 2014; Knight, Cavusgil 2004). Zhang *et al.* (2009) introduced the concept of international entrepreneurship capability, arguing that it enables firms to leverage capabilities and exploit opportunities in international markets (Zahra, Covin 1995; Lumpkin, Dess 1996; Knight, Cavusgil 2004). This conclusion is consistent with the resource-based view.

The EO-performance relationship is not simple. EO is often mentioned as an antecedent of growth, competitive advantage and superior performance. If prior research supports a positive relationship between EO and performance (Wiklund, Shepherd 2005; Rauch *et al.* 2009), some authors claim otherwise (Lumpkin, Dess 1996; Zahra, Covin 1995). It is clear there are some specificities that are relevant to the EO-performance relationship that need to be analysed from a different perspective.

The relationship between innovation and EO is not yet clear, mainly in SMEs. Alegre and Chiva (2013) analysed the role of innovation performance as a mediator of EO and firm performance. Balan and Lindsay (2010) analysed business performance in small hotels in Australia with innovation capabilities and EO as antecedents. Innovation capability had a positive relationship with business performance, but EO was found to have no impact. Hult *et al.* (2004) claim that EO is an incremental process within the firm through which innovation results. However, they define innovativeness as the firm's capacity to create new processes and to introduce new products into the market.

There are several studies addressing innovation, EO and performance among SME. Some of them support a direct relationship between EO and performance in which EO is an antecedent of business performance (Jantunen *et al.* 2005; Rauch *et al.* 2009). Celec *et al.* (2014) claim that innovation capabilities do not influence export performance. However, there is a significant interactive effect between EO and innovation capabilities when EO is used as a moderator between innovation capabilities and performance measures.

It is clear that the relationship between innovation capabilities and EO is not straightforward. Innovation is a complex task that involves internal and external knowledge

to create innovative outcomes. It involves internal capabilities to interpret market and technological knowledge, as well as coordination of interactions among all internal and external stakeholders within the innovation process. Moreover, firms with high innovation capabilities are more successful both in domestic and overseas markets than firms with lower innovation capabilities (Salomon, Shaver 2005). However, as not all SMEs have the ability to identify new opportunities and to cope with risk-taking behaviour, not all SMEs are equally endowed in their EO.

With less resources and international experience (Karlsen, Nordhus 2011), SMEs can be expected to be more reactive than proactive to external stimuli of international markets. Verisan and Achimescu (2011) proposed a model of export behaviour as a process that leads the firm to internationalisation with reactive or proactive involvement and motivations. In a reactive strategy, the firm reacts to changes in its operational conditions and perceives internationalisation as an answer to that change (competitive pressure, unsolicited foreign orders, seasonal effects of demand, saturation of domestic market or its limited size, geographic proximity and reduced psychological distance are some examples). When using a proactive strategy, firms initiate the internationalisation process drawing on its own internal competencies or market opportunities (growth, technological competences, unique products, economies of scale, or foreign market opportunities).

As SMEs lack deep knowledge of international markets, they typically react to external stimuli of their international clients (Katsikeas 1996; Bell *et al.* 2003). As such we seek to analyse how EO mediates the innovation-performance relationship of two different types of SMEs: those with proactive and reactive behaviour to external market stimuli, as EO is expected to influence the firms' profile (Avlonitis, Salavou 2007). As SMEs that are proactive in relation to external stimuli behave differently from reactive SMEs, we expect EO to have an important mediation effect that is contingent upon the SME being proactive/reactive to external stimuli. As such, we propose the following hypotheses about proactivity in SMEs:

**H<sub>1a</sub>**: Innovation capabilities have a positive direct effect on export performance.

**H<sub>1b</sub>**: EO positively mediates the relationship between innovation capabilities and export performance.

For reactive SMEs, we propose the following hypotheses:

**H<sub>1r</sub>**: Innovation capabilities have a positive direct effect on export performance.

**H<sub>2r</sub>**: EO does not mediate the relationship between innovation capabilities and export performance.

With these hypotheses we hope to explain performance differences in a particular industry based on EO and proactive/reactive behaviour in SMEs (Fig. 1).

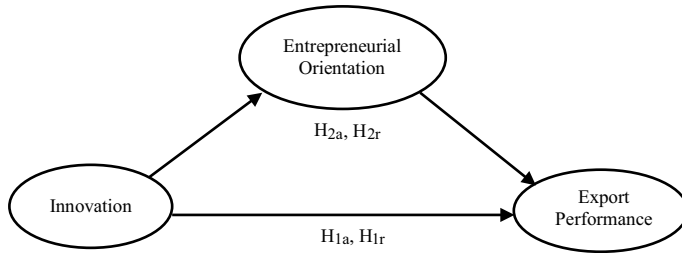


Fig. 1. Research model  
Source: Own elaboration.

## 2. Research design and methodology

The plastic industry in Portugal is composed of a universe of 650 highly competitive industrial SMEs in which innovation plays a key role. However, only firms with more than 20 employees were analysed; a total of 147 firms representing 22% of the industry. Our SME indicator is based on employment, using the cut-off of 250 employees to distinguish SMEs from large firms.

Data was collected through a questionnaire, consisting of 5-point Likert-type scales adapted from previously validated research. The measurement scale is provided in Table 1.

The questionnaire was pre-tested on a convenience sample. As a result of the pre-test, the number of items per variable was reduced to keep the questionnaire to a manageable size.

The on line questionnaire was emailed to the firms' top management team (CEO, export/sales/commercial manager, R&D or marketing manager, according to information obtained from the firms). All firms in the plastics industry were contacted first by phone and by email.

To separate active from reactive firms a dichotomous variable was created in which the average value was used as the threshold value. Firms with reactive to external stimulus values larger than the average value were described as reactive. Firms with reactive to external stimulus values lower than the average value were described as proactive. We identified 64 proactive and 83 reactive firms.

PLS-SEM is robust (a) with models that contain latent variables and mediation and multiple group comparisons (Lowry, Gaskin 2014); (b) when research is at an early stage of theoretical development (Henseler, Chin 2010); and (c) when constructs may be measured by less than four items (Chin 1998; Lowry, Gaskin 2014). In this study we used SmartPLS 2.0 software.

As PLS employs bootstrapping to test the significance of relationships, it works well in the analysis of mediation (Hair *et al.* 2014). For testing the mediation effects we followed the procedure proposed by Hair *et al.* (2014). In order to determine the extent of the indirect effect in relation to the total effect we use the variance accounted for (VAF) (Hair *et al.* 2014).

The Sobel test is a traditional method of testing the significance of mediation effects (Sobel 1982). Bootstrapping was used to evaluate the significance of the path coefficients and estimate the standard error. We used the PLS-Multigroup-Analysis (PLS-MGA) to analyse differences between active and reactive firms.

### 3. Results and findings

The average sales volume is € 17 million (in 2014), the average number of employees is 85, the average international sales as a percentage of total sales is 45%, and the firms operate in an average of 15 countries.

The measurement model was evaluated in terms of reliability, convergent validity and discriminant validity. As shown in Table 1, with the exception of EO3, all other items have higher loadings than the minimum recommended threshold of 0.7 (Götz et al. 2010). We decided not to eliminate EO3 because it was very near the cut-off point. Results support the reliability of the measurement indicators. We dropped items with loadings below 0.7.

Table 1. Scale items and loadings

Questionnaire items	Indicator	Loading
<b>Entrepreneurial orientation</b> [adapted from Jantunen et al. (2005), Miller and Friesen (1983)]		
We are among the first ones to implement progressive and innovative production processes and practices	EO1	0.732
The management of our firm supports the projects that are associated with risks and expectations for returns higher than average	EO2	0.716
We actively internalize the new practices developed in other sectors and exploit them in our business	EO3	0.672
We are able to take on unexpected opportunities*	EO4	
<b>Innovation capability</b> (second order construct) [adapted from Guan and Ma (2003)]		
Learning capability		
Systematically monitoring technology development trends*	LC1	
Re-innovation ability facing international market based on mainland using	LC2	0.825
Cultivating learning consciousness and investing on learning	LC3	0.783
<b>Manufacturing capability</b>		
Technological level of manufacturing equipment*	MC1	
Production regulations and system	MC2	0.822
Total quality management	MC3	0.776
<b>Marketing capability</b>		
Long-term customer relationship for understanding diverse customer requirements*	MKTC1	

*End of Table 2*

Questionnaire items	Indicator	Loading
Controlling and managing distribution network	MKTC2	0.876
After service and technological assistance	MKTC3	0.725
<b>Organisational capability</b>		
Adjusting organisation structure flexibly according to new innovation projects	OC1	0.747
Centralizing resources on innovation activity quickly	OC2	0.860
Overlap between R&D, marketing and manufacturing functions*	OC3	
<b>R&amp;D capability</b>		
Choosing special personnel or building organisation to collect various innovation ideas*	RDC1	
Facilitating communication among R&D personals	RDC2	0.753
Communication between R&D department and marketing department	RDC3	0.809
<b>Resource exploitation capability</b>		
Attaching importance to human resource*	REC1	
Steady capital supplement in innovation activity	REC2	0.798
Making full use of external technologies	REC3	0.782
<b>Strategic capability</b>		
Support from top management *	SC1	
Connection between technological strategy and business strategy	SC2	0.727
Advanced decision system	SC3	0.714
Adjusting innovation strategy accordingly	SC4	0.722
<b>Export Performance</b> [Adapted from: Jantunen <i>et al.</i> (2005), Kuivalainen <i>et al.</i> (2007), Aulakh <i>et al.</i> (2000) and Zou <i>et al.</i> (1998)]		
Sales export volume*	SI1	
International market share	SI2	0.703
Export profitability*	SI3	
Exporting has contributed to the sales growth of our firm*	OSI1	
The export venture has achieved rapid growth	OSI2	0.839
Our export activity has strengthened our strategic position*	OSI3	

*Note:* \* items below the 0,7 threshold value.

Table 2 describes the average variance extracted (AVE), the composite reliability (CR), and the correlations of each first order latent variable. Convergent and discriminant validity is assured based on Götz *et al.* (2010).

Figure 2 shows the direct relationship between innovation capabilities and export performance.

Table 2. Discriminant validity

	AVE	CR	Correlations									
			1.	2.	3.	4.	5.	6.	7.	8.	9.	
1. EO	0.500	0.750	<b>0.707</b>									
2. EP	0.599	0.748	0.525	<b>0.774</b>								
3. LC	0.647	0.785	0.334	0.186	<b>0.804</b>							
4. MKTC	0.647	0.784	0.262	0.093	0.267	<b>0.804</b>						
5. MC	0.639	0.780	0.352	0.314	0.309	0.231	<b>0.800</b>					
6. OC	0.649	0.786	0.346	0.177	0.172	0.319	0.147	<b>0.806</b>				
7. RDC	0.610	0.758	0.190	0.161	0.255	0.515	0.186	0.329	<b>0.781</b>			
8. REC	0.624	0.769	0.445	0.280	0.337	0.284	0.344	0.314	0.327	<b>0.790</b>		
9. SC	0.520	0.765	0.441	0.327	0.310	0.312	0.451	0.330	0.337	0.380	<b>0.721</b>	

Note: elements of the diagonal (in bold) are the square root of AVE. Off diagonal elements are simple bivariate correlations between constructs.

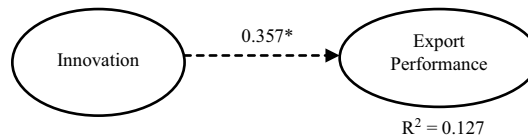


Fig. 2. Structural model  
 Note: \* p-value <0.05; \*\* p-value <0.01.  
 Source: Own elaboration.

Table 3 presents an overview of path coefficients for both proactive and reactive groups after EO was introduced as mediator, using PLS-MGA and the Sobel Test. Bases on the results, H<sub>1a</sub> is supported and H<sub>1r</sub> is not validated.

Table 3. Mediation analysis for groups 1 and 2

	Group 1 – proactive		Group 2 – reactive		Differences between Group 1 – Group 2	
	β	p-value	β	p-value	β	p-value
Innovation → EP (no mediation)	0.625	0.000	-0.199	0.174	-	-
Innovation → EP (with mediation)	0.249	0.131	-0.278	0.061	0.526	0.014
Innovation → EO	0.708	0.000	0.234	0.040	0.474	0.042
EO → EP	0.535	0.000	0.372	0.340	0.163	0.207
Sobel Test	-	0.002	-	0.404	-	-
VAF	0.665		Not applicable		-	

The results obtained for Group 1 (Fig. 3) (proactive firms) explains 53.6% of the variance of the model, whereas Group 2 (Fig. 4) (reactive firms) explains only 16.7%. Group 1 shows a total direct effect ( $\beta = 0.627$ ) that is more than 2.5 times larger than the direct effect ( $\beta = 0.249$ ). The influence is outstanding when we compare it to the results obtained for Group 2 ( $\beta = -0.191$ ), although the result for the Group 2 is not statistically significant.

When we analyse the mediation effect for Group 1, the Sobel test is statistically significant at the 0.01 level, validating  $H_{2a}$ . As the VAF accounted for is 66.5%, we are before a mediation effect (of EO) between innovation and export performance. The Sobel test is not statistically significant for Group 2, validating  $H_{2r}$ . As such, we can conclude that firms from Group 1 and Group 2 behave differently.

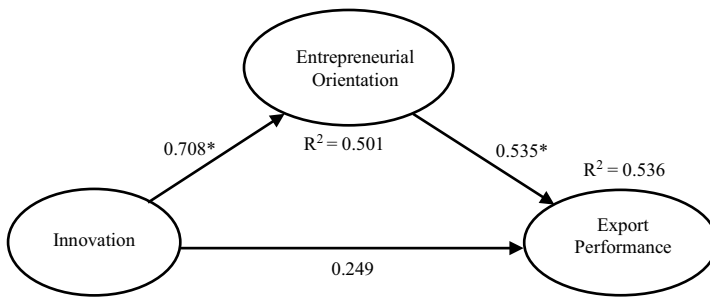


Fig. 3. Structural model – Group 1 (proactive external stimuli)

Note: \* p-value < 0.05; \*\* p-value < 0.01.

Source: Own elaboration.

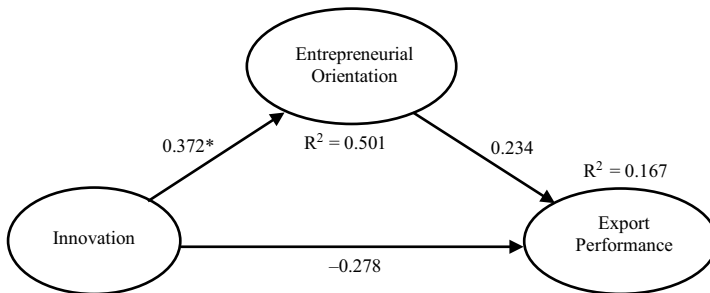


Fig. 4. Structural model – Group 2 (reactive external stimuli)

Note: \* p-value < 0.05; \*\* p-value < 0.01.

Source: Own elaboration.

### Conclusions, limitations and future perspectives

First, the results show that innovation capabilities can explain export performance, which is consistent with previous literature. However, the mediation effects of EO suggest that proactive firms are not only better at innovating but also their EO capabilities underpin better performance in international markets when compared with firms that react to external stimuli.

This paper contributes to both theory and practice. The negative relationship between innovation capabilities and export performance, among reactive firms, was not expected. One can conclude that innovative capabilities are not as powerful in reactive firms as in proactive firms. It seems that reactive firms do not rely on innovation to compete in international markets, which might explain the huge difference between the coefficient of determination of proactive and reactive firms. Moreover, while proactive firms deploy their innovation capabilities to compete successfully and to underpin export performance activities, reactive firms not only lack those innovation capabilities – relying in unsolicited orders and pull strategies from firms abroad – but also investing on those innovation capabilities could divert their scarce resources to riskier activities.

Our research complements previous studies of innovation and export performance showing that the mediation of the innovation-export performance relationship by EO is contingent upon the type of proactive or reactive firm. EO influences how firms operate, make decisions and use innovation activities to influence export performance. The importance of the mediating role of EO is particularly relevant when we take into account proactive and reactive firms. It is clear the more prevalence of the mediating role of EO of proactive firms as their innovation outcomes are more pervasive for firms' export performance when compared to that of reactive firms. As such, EO is an important variable to take into account in innovation studies, especially in firms that proactively seek to embrace new opportunities abroad. Moreover, although EO is a multifaceted capability since it has been related to the appropriation of innovative capabilities boosting performance, this study has empirically proven that innovation-driven firms generate a self-reinforcing cycle not only through innovation capabilities, but also proactive motivations underpin export performance through proper market exploitation of innovative capabilities. As such, EO is more than an antecedent of export performance as it represents an important capability for firms to exploit and sustain their competitive advantage.

Regarding managerial implications, SME managers need to develop more EO skills to take on new opportunities and not just react to external orders from abroad, which may lead to more effective management of SMEs. Moreover, public policy makers should provide training programmes so that reactive firms can understand the intricacies of internationalisation and proactiveness embrace a more proactive behaviour.

Future research should combine capabilities of firms and their export performance with market orientation metrics to reveal how firms that have a proactive orientation to foreign markets differ from firms that are reactive in their innovation capabilities. Another important aspect that deserves investigation is a cross industry comparison taking into account the technological intensity, the life cycle of the firms' products, as well as how SMEs and large firms differ. A cross-country validation would be of added value for future research.

One of the limitation of this study is that is the fact that we used one informant per firm, which may have influenced some of the results. The research is of cross-sectional nature, neglecting the intrinsic characteristics of a longitudinal research.

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