

## **The mediating role of organizational innovation between capabilities and export performance**

Margarida Vicente (Polytechnic Institute of Viseu, Portugal)  
Maria José Antunes (Polytechnic Institute of Viseu, Portugal)  
Cláudia Seabra (Polytechnic Institute of Viseu, Portugal)

This research examines how marketing capabilities, technological capabilities, and organizational innovation influence export performance. More specifically, we examine the impact of marketing and technological capabilities on organizational innovation and the influence of organizational innovation on export performance. We investigate the mediating role of organizational innovation in the relationships between these two capabilities (i.e. marketing and technological capabilities) and export performance. In addition, we analyze whether these effects are moderated by high vs. low technological turbulence. Survey data of 471 exporting manufacturing firms based in Portugal was used to test the relationships between the constructs analyzed in this study. The findings demonstrate that marketing and technological capabilities have a significant effect on organizational innovation intensity, which in turn has a positive impact on export performance. Organizational innovation positively mediates the relationships between marketing and technological capabilities and export performance. Furthermore, the results show that marketing capabilities have a stronger impact on organizational innovation and export performance than technological capabilities. In both low and high turbulence, the innovation effects of marketing capabilities are higher than the effects of technological capabilities. Implications for scholars and practitioners are discussed along with suggestions for future research.

**Key words:** Marketing capabilities; Technological capabilities; Organizational innovation; Export performance.

### **Introduction**

Innovation is recognized as an important factor to compete in the international arena but difficult to manage effectively (Ren et al., 2015). As the company moves forward in the internationalization process it becomes increasingly important to possess and develop capabilities that allow to produce innovative products in order to meet foreign customers requirements better than competitors (Tan & Sousa, 2015).

The investment in capabilities development depletes firm's resources and may reduce the chances of firm survival in the short term (Sapienza et al., 2006). Therefore, it is important to identify key capabilities and recognize their individual contribution to innovation to help guide the firm's investment needed in the export context (Eng & Spickett-Jones, 2009).

According to the literature, innovation depends simultaneously on both, marketing and technological skills (e.g., Zhou et al., 2005). Marketing capabilities are the firm's ability to understand and forecast customer's needs and to effectively link its products to these needs (Katsikeas, 1994; Sousa & Lages, 2011). Technological capabilities refer to the firm's accumulation of technological knowledge that can be used to create new products or to improve existent ones (Kyläheiko et al., 2011). They also include Research and Development (R&D) activities (e.g., Roper & Love, 2002).

The information exchange between marketing and R&D departments allows a firm to develop differentiated and high quality products, at most competitive prices (Renko et al., 2009; Yam et al., 2011). However, organizations operate with a very limited budget, and so it is essential to decide whether the investment should be made in marketing vs. technological resources during their pursuit of innovation (Ren, et al., 2015). In this context, it is crucial to assess critically how marketing and technological capabilities of exporting firms influence their ability to innovate and their performance in international markets.

Although previous research has contributed to our understanding about the importance of marketing and technological capabilities, and their impact on firm performance (e.g., Song et al., 2005), there still exists a gap in the literature about the firms' ability to leverage marketing and technological capabilities into organizational innovation. Previous studies do not investigate organizational innovation as a mediating variable between capabilities (i.e. marketing and technological capabilities) and export performance.

Highlighting this gap in the literature, this study has several objectives. First, we analyze the effect of marketing and technological capabilities on organizational innovation. In addition, we examine the relative impact of marketing and technological capabilities on organizational innovation. This way, we increase understanding about the critical capability necessary for innovation. Second, we test the influence of organizational innovation on export performance. Additionally, we examine the relative impact of marketing and technological capabilities on export performance. Third, we investigate the mediating role of organizational innovation in the relationships between marketing and technological capabilities and export performance.

## **Methodology**

Data for this study was collected in 2012, using a sample of Portuguese exporting manufacturers. We select a random sample of 3000 firms from the Trade & Investment Agency (AICEP Portugal Global) government database. To ensure data source reliability, the person more engaged in the firm's export operations was considered as key respondent.

An online questionnaire, developed from the open source software "LimeSurvey", was the basis of the data used to test the model. Of the 3000 e-mails sent, 159 bounced back to the recipient's mail server, 3 firms informed they were no longer in business, and 98 firms decline to participate. In consequence, the final sample size was 2740 firms. After the initial invitation, the LimeSurvey software generated automatically three reminders to all non-respondents, spaced one week apart. We obtained 471 valid questionnaires.

## **Literature review**

According to the resource-based view (e.g., Barney, 1991; Newbert, 2007; Wernerfelt, 1984), firms with valuable, rare, inimitable and non-substitutable resources and capabilities can generate sustainable competitive advantage. Marketing and technological capabilities are complex bundles of resources, skills and collective learning, based on knowledge that is tacit and difficult to copy for competitors (Krasnikov & Jayachandran, 2008). However, despite the RBV consider these two capabilities critical sources of competitive advantage (e.g., Barney, 1991; Wernerfelt, 1984), the mere possession of capabilities may not improve performance. Sometimes, capabilities can turn into core rigidities and may have a negative impact on some aspects of firm performance (Haas & Hansen, 2005). It is through the achievement of organizational innovation that marketing and technological capabilities are able to realize their full potential in respect of performance (e.g., Eng & Okten, 2011). Exporting firms need to develop marketing and technological capabilities, which will contribute to increase their organizational innovation intensity (e.g., Eng & Okten, 2011), which, in turn, is an important antecedent of export performance (e.g., O'Cass & Weerawardena, 2009).

Organizational innovation may generate different types and degrees of innovation (Vicente et al., 2015). The types of innovation can be categorized as technological (in products or processes) and non-technological (in marketing or managerial). The degree of innovation can be classified between incremental (implying the development of simple improvements in existing products) and radical innovations (involving significant changes in the technology of existing products). In this study, we conceptualize innovation in a broad sense including all types and degrees of innovation. We use organizational innovation intensity, which is defined as the ability to apply new ideas in products,

processes, marketing systems, management or in work organization, that will create added value either directly for the firm or indirectly for its customers (Weerawardena, 2003a, 2003b).

Our conceptual model is outlined in Fig. 1. We use the RBV to support the theory that marketing capabilities, technological capabilities, and organizational innovation intensity are essential to attain superior export performance. Specifically, we consider that organizational innovation is a vehicle to renew firm's capabilities, such marketing and technological capabilities, and thus to achieve superior performance in export markets.

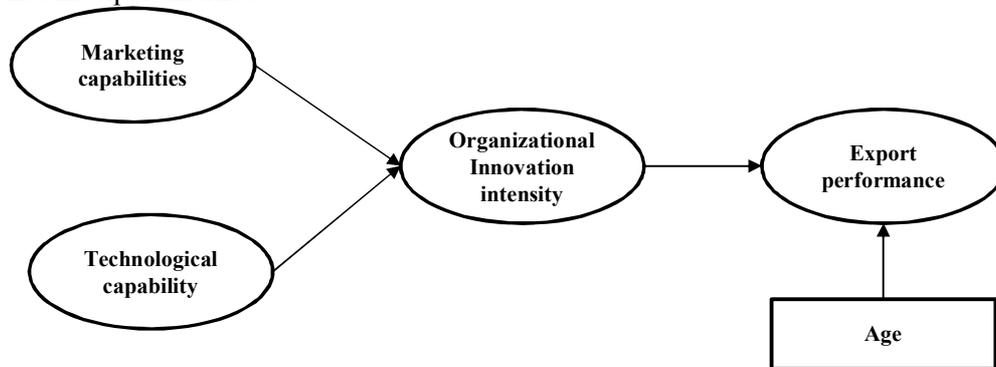


Figure 1 – Hypothesized relationships.

Successful innovation requires firms to have competences relating to customers and technology (e.g., Danneels, 2002). According to the literature, these competences can be classified as marketing and technological capabilities.

Marketing capabilities are an important element to assess the success of exporting companies when they enter and compete in international markets (Tan & Sousa, 2015). Marketing capabilities allow to create innovative, unique and differentiated new products, and a strong brand image, providing a unique value to consumers, difficult for competitors to imitate (Murray et al., 2011). Therefore, marketing capabilities enable a firm to satisfy customers additionally, even more than its competitors, and thus to obtain a greater performance in the export market (e.g., Murray, et al., 2011; Vorhies & Morgan, 2005).

In addition, marketing capabilities have been established as important key drivers for organizational innovation (e.g., Weerawardena, 2003b). They involve the integration of all marketing related activities using superior knowledge about foreign customers' needs, competitive behaviors, and market trends (Day, 1994; Nath et al., 2010). In doing this, the firm's ability to capture value is stronger and the company is more likely to invest in value creation that will result into various innovation efforts (Ren, et al., 2015). Firms actively integrate their market knowledge to develop radical changes in products, processes, marketing methods and managerial systems, which contribute to superior organizational innovation intensity (e.g., Mariadoss et al., 2011; Weerawardena, 2003b). According to this, we propose the following hypothesis:

Hypothesis 1. The firm's marketing capabilities positively influence organizational innovation intensity.

Technological capabilities include the technological skills of individuals and work teams, processes and routines, and other technological assets that contribute to the firm's technological potential (Kyläheiko, et al., 2011). Technological capabilities allow exporting firms to minimize R&D costs and decrease production costs more quickly than its competitors due to economies of scale (Kaleka, 2002). Consequently, a firm can charge a lower price for the same products or services, and thus to increase market share and business performance (e.g., Yam et al., 2004).

Furthermore, there is empirical evidence that technological capabilities have a positive relationship to innovation (e.g., Gatignon & Xuereb, 1997). Technological capabilities represent the investment in the creation of technological knowledge, technology development, and know-how engendered by R&D that leads to improvement and successful innovation (e.g., Yam, et al., 2011; Zhou & Wu, 2010). Exporters with more diverse technological knowledge capture more opportunities and tend to develop

more radical innovations (Quintana-Garcia and Benavides-Velasco 2008). In line with the above, we propose the following hypothesis:

Hypothesis 2. The firm's technological capabilities positively influence organizational innovation intensity.

According to literature, innovation increases the firm's ability to respond to changes in domestic and international markets (Zahra & Covin, 1994) and contributes to business performance improvement in the global arena (e.g., O'Cass & Weerawardena, 2009). Innovation allows to develop and license technologies, adopt more efficient production techniques, and introduce new products and processes (Kafourous et al., 2008). So, when firms successfully implemented radical changes in their value creating activities, they are more likely to outperform competitors, and thus to increase their market share and economic performance (e.g., O'Cass & Weerawardena, 2009; Zhou, et al., 2005). According to this, we propose the following hypothesis:

Hypothesis 3: The firms organizational innovation intensity positively influence export performance.

All the above discussion about the effects of marketing and technological capabilities on organizational innovation intensity, and the linkage between organizational innovation intensity and export performance, implies that organizational innovation appears to mediate the relationship between capabilities (i.e. marketing and technological capabilities) and export performance. The degree to which marketing and technological capabilities can improve export performance may depend on how well they can lead to organizational innovation. Thus, we propose the following hypotheses:

Hypothesis 4. The firm's organizational innovation intensity mediates the effect of marketing capabilities on export performance.

Hypothesis 5. The firm's organizational innovation intensity mediates the effect of technological capabilities on export performance.

## **Empirical component**

The items used to operationalize each construct were adapted based on existing literature. A well-validated measures reported in previous research were used. All constructs in the model were measured with multiple-item scales, with the exception of firm's age (see Appendix A).

To refined the measures and assess the reliability and validity of the constructs, the items were subjected to an exploratory factor analysis (EFA) followed by a confirmatory factor analysis (CFA), using maximum likelihood estimation procedures in LISREL 8.8 (Jöreskog & Sörbom, 1993).

The overall chi-square for this model is significant ( $\chi^2(492)=1821.22$ ,  $p<0.00$ ). Four measures of fit were examined: the Bentler non-normed fit index (NNFI=0.94) the comparative fit index (CFI=0.94), and the root mean square error of approximation (RMSEA=0.076). The results suggest that the scale measures were internally consistent, able to provide a good fit of the factor model to the data.

Item reliabilities were assessed examining the loadings of the individual items in the respective constructs. The majority of the loadings are greater than 0.7 (which is the minimum value for many researchers). Convergent validity was assessed by calculating the average variance extracted (AVE) (Fornell & Larcker, 1981). All values are greater than 0.5, indicating convergent validity. Composite reliability (Bagozzi, 1980) was also calculated for each construct. All constructs meet the suggested minimum acceptable level for composite reliability of 0.7 (Nunnally & Bernstein, 1994). Discriminant validity was assessed by observing the construct intercorrelations. Adequate discriminant validity is evident since the square root of AVE between any two constructs (diagonal) is greater than the correlation between those constructs (off-diagonal).

In this model, marketing capabilities are a second-order construct composed of four first-order indicators: pricing capability, product development capability, communication capability and distribution capability. Measures of goodness of fit support the null hypothesis that the first-order factors converge to a single higher-order construct ( $\chi^2(86)=266.77$ ,  $p<0.00$ , NNFI=0.97, CFI=0.98, RMSEA=0.067).

The conceptual framework depicted in Fig. 1 was tested using structural equation modeling (SEM). To examine how organizational innovation intensity may act as a mediator we adopted the SEM approach outlined by Mackinnon (2002). We estimated a baseline model as the full mediation model (see Figure 1), which did not have direct paths from the two predictors (marketing and technological capabilities) to the export performance outcome. The results suggest a good fit of the model to the data ( $\chi^2(513)=1885.49$ ,  $p<0.00$ , NNFI=0.94, CFI=0.94, RMSEA=0.075).

Following the approach advocated by Anderson & Gerbing (1988), we tested a series of nested models against our baseline model through sequential chi-square tests with the parameter constraints of interest in this study. The findings suggest that adding the two direct paths (marketing and technological capabilities to export performance) to the baseline model significantly improves the model fit ( $\Delta\chi^2=22.3$ ,  $\Delta df=2$ ,  $p<0.00$ ).

Consistent with H1, marketing capabilities positively influence organizational innovation intensity ( $\beta=0.58$ ,  $t\text{-value}=7.48$ ). In line with H2, technological capabilities have a significant positive impact on organizational innovation intensity ( $\beta=0.16$ ,  $t\text{-value}=2.19$ ). Consistent with H3, organizational innovation intensity has a significant positive impact on export performance ( $\beta=0.31$ ,  $t\text{-value}=5.85$ ).

Hypotheses 4 and 5 state that organizational innovation intensity mediates the relationship between marketing capabilities and export performance, as well as the relationship between technological capabilities and export performance. The results of our different models with and without direct paths from the predictors to the outcome variable provide support for the mediation effect. Therefore, Hypotheses 4 and 5 are supported.

In addition, we compare the relative effect of marketing and technological capabilities on organizational innovation and export performance. The results show that marketing capabilities have a stronger impact on organizational innovation than technological capabilities ( $\beta=0.58$ ,  $t\text{-value}=7.48$  and  $\beta=0.16$ ,  $t\text{-value}=2.19$ , respectively). In addition, marketing capabilities have a stronger effect on export performance than technological capabilities.

Both the direct ( $\beta=0.39$ ,  $t\text{-value}=7.48$ ) and indirect ( $\beta=0.15$ ,  $t\text{-value}=7.48$ ) effects of marketing capabilities on export performance are found to be positively statistically significant. Consequently, the indirect relationships strengthen the total effect ( $\beta=0.54$ ,  $t\text{-value}=7.48$ ). However, the direct effect of marketing capabilities on export performance is stronger than the indirect effect.

## **Discussion**

The key finding in this study is that marketing and technological capabilities positively influence export performance, through the development of both technological and non-technological innovation. In other words, marketing and technological capabilities are likely to provide an exporting firm with innovative practices that contribute to a superior export performance.

This is an important finding in the context of the discussion about the role of marketing and technology as a firm value capturing capabilities (e.g., Ren, et al., 2015). Some previous studies suggest that marketing and technological capabilities have a direct impact on performance (e.g., Song, et al., 2005). Other studies indicate that marketing capabilities can only be translate into innovative capability through the path of technological capabilities (e.g., Eng & Okten, 2011). This study allows us to contribute to the empirical research, showing that the development of marketing and technological skills is an important way to achieve organizational innovation and, therefore, to obtain a greater performance in the export market. This means that it should be considered the mediating effect of organizational innovation intensity between marketing and technological capabilities and export performance.

However, we cannot say that marketing capabilities are exclusively converted into performance through their connection to organizational innovation. Marketing capabilities contribute to export performance both directly and indirectly by the mediating effect of organizational innovation. In other words, marketing capabilities are powerful tools that can directly lead to superior performance and indirectly through the achievement of organizational innovation. Therefore, the development of

marketing capabilities should not only focus on organizational innovation, but also in the direct effect that these capabilities have on the export performance.

Another important finding in this study is the significance of marketing capability in terms of its ability to influence organizational innovation and performance, more than technological capabilities. This means that marketing assets are vital for a firm that desires to increase its innovation value and market share.

Taking into account that exporting firms have limited resources, they have to make tough decisions whether money must be spent on marketing vs. technological capabilities. The current findings point out for the relevance of marketing in innovation efforts and performance, when compared to other business capabilities, such technological capabilities. Thus, managers must focus specially on the development of marketing capabilities. In doing so, they have focused on delivering superior customer value, which will lead to a strongest innovation and performance outcome possible.

However, this does not mean that technological capabilities are unimportant. Note that technological capabilities have a positive and significant influence on organizational innovation intensity. This means that without the ability to act on innovation intensity, technological capabilities will not affect performance. In this case, organizational innovation is the only path by which technological capabilities may lead to export performance.

## **Conclusion**

This study increases the comprehension of the RBV in export markets. Consistent with the RBV theory, our findings suggest that marketing and technological capabilities are firm specific, complex capabilities relevant to achieve a superior performance in export markets (cf., Barney, 1991; Day, 1994). Specifically, marketing capabilities have a greater impact on performance because they can generate tangible benefits (Krasnikov & Jayachandran, 2008). Through the customer relationship management and a high sensitivity to market needs, the marketing ability to retain and acquire new customers become increasingly higher in international context.

From a managerial perspective, this article helps practitioners to create a path for building superior performance. Exporters could enjoy superior performance in export markets both directly converting marketing capabilities into superior export performance and indirectly translating marketing and technological capabilities into performance via the bridging the role of organizational innovation intensity. The development of relevant marketing and technological capabilities should help manufacturers increase their earnings in competitive markets by allowing companies to capture more of the value in the supply chain.

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## Appendix

Construct/items	Standardized loadings	t-value
Pricing capability ( $\alpha=0.743$ , $\rho_{vc}(n)=0.51$ , $\rho=0.75$ ) (adapted from Zou <i>et al.</i> , 2003)		
Scale: 1-strongly disagree; 5-strongly agree (relative to major export market competitors)		
1. We respond quickly to competitors' pricing tactics	0.84	17.47
2. We use pricing skills to respond quickly to any customer change	0.71	14.82
3. We communicate pricing structures and levels quickly to customers	0.57	11.86
Product development capability ( $\alpha=0.838$ , $\rho_{vc}(n)=0.58$ , $\rho=0.84$ ) (adapted from Zou <i>et al.</i> , 2003)		
Scale: 1-strongly disagree; 5-strongly agree (relative to major export market competitors)		
1. We develop new products for export to exploit R&D investment	0.68	15.92
2. We speedily develop and launch new products for export	0.80	19.69
3. We manage overall new product development systems for export market well	0.81	20.21
4. We successfully launch new products for exports	0.74	17.89
Communication capability ( $\alpha=0.954$ , $\rho_{vc}(n)=0.88$ , $\rho=0.95$ ) (adapted from Zou <i>et al.</i> , 2003)		
Scale: 1-strongly disagree; 5-strongly agree (relative to major export market competitors)		
1. We skillfully use marketing communications	0.90	25.11
2. We use marketing communication skills and processes well	0.98	29.35
3. We effectively manage marketing communication programs	0.92	26.23
Distribution capability ( $\alpha=0.927$ , $\rho_{vc}(n)=0.73$ , $\rho=0.93$ ) (adapted from Zou <i>et al.</i> , 2003)		
Scale: 1-strongly disagree; 5-strongly agree (relative to major export market competitors)		
1. We attract and retain the best distributors	0.74	18.39
2. We satisfy the needs of distributors	0.90	24.83
3. We add value to distributors' businesses	0.91	25.44
4. We are close in working with distributors/retailers	0.83	21.71
5. We provide high level of support to distributors	0.87	23.50
Technological capability ( $\alpha=0.798$ , $\rho_{vc}(n)=0.57$ , $\rho=0.80$ ) (adapted from Kyläheiko <i>et al.</i> , 2011)		
Scale: 1-strongly disagree; 5-strongly agree		
1. Our technological capabilities are top class	0.69	15.63
2. The success of our R&D activities is based on long-term know-how	0.69	15.83
3. We have invested heavily in certain R&D projects	0.88	21.24
Organizational innovation intensity ( $\alpha=0.919$ , $\rho_{vc}(n)=0.59$ , $\rho=0.85$ ) (adapted from Weerawardena, 2003)		
Scale: 1-limited; 5-extensive		
1. Product innovations introduced by our firm during the last three years have been	0.76	18.91
2. Process innovations introduced by our firm during the last three years have been	0.79	20.25
3. Managerial innovations introduced by our firm during the last three years have been	0.76	19.02
4. Marketing innovations introduced by your firm during the last three years have been	0.72	17.78
Scale: 1-incremental; 5-radical		
1. Product improvements have been mainly	0.78	19.57
2. Process innovations have been mainly	0.81	20.82
3. Managerial innovations have been mainly	0.80	20.33
4. Marketing innovations have been mainly	0.73	17.90
Export performance ( $\alpha=0.894$ , $\rho_{vc}(n)=0.69$ , $\rho=0.90$ ) (adapted from Morgan <i>et al.</i> , 2006)		
Scale: 1-much worse than competitors; 5-much better than competitors		
1. Export venture's market share growth	0.86	22.62
2. Growth in export venture sales revenue	0.92	25.06
3. Acquiring new export venture customers	0.76	18.95
4. Increasing sales to current export customers	0.76	18.91
Technological turbulence ( $\alpha=0.803$ , $\rho_{vc}(n)=0.59$ , $\rho=0.81$ ) (adapted from Kaleka, 2012)		
Scale: 1-strongly disagree; 5-strongly agree		
1. The technology in our industry is changing rapidly	0.74	16.78
2. Technological changes provide big opportunities in our industry	0.82	18.95
3. A large number of new product ideas have been made possible through technological breakthroughs in our industry	0.74	16.74

$\alpha$ =internal reliability;  $\rho_{vc}(n)$ = variance extracted;  $\rho$ =composite reliability.

