

# Measuring innovation capability in exporting firms: The INNOVSCALE

Margarida Vicente

POLYTECHNIC INSTITUTE OF VISEU, E-mail adress: margarida@estv.ipv.pt

José Luís Abrantes

POLYTECHNIC INSTITUTE OF VISEU, E-mail adress: jlabrantes@estv.ipv.pt

Cláudia Seabra

POLYTECHNIC INSTITUTE OF VISEU, E-mail adress: cseabra@estv.ipv.pt

Mário Sérgio Teixeira

Trás-os-Montes e Alto Douro University, E-mail adress: mariosergio@utad.pt

## Abstract

The development of innovation capability is an important topic for both managers and academics. However, studies that investigate which elements integrate innovation capability in the context of export market are very scarce. The purpose of this paper is to identify important dimensions to build a scale for measuring innovation capability in exporting firms. Survey data of 471 exporting manufacturing firms was used to develop this scale. The findings reveal that innovation capability is a higher-order construct formed by four dimensions: innovativeness, technological capability, innovation strategy and new product development capability. The results also indicate that all four dimensions of the innovation capability scale are positively and significantly associated with export venture performance.

**Keywords.** *Innovation, Strategy, Technology, New product, Export industry.*

Acknowledgments: FCT and CI&DETS (PEst-OE/CED/UI4016/2011)

## 1. Introduction

Within international markets, firms face an acute competition, rapid technological changes and more difficulties in obtaining important know-how (Teece, 2007). The intensity of global competition, shorter product life cycles, accelerate product research and development, and the easiness of imitation impel exporting firms to innovation activity as a way to ensure their competitiveness (Chadha, 2009; Roper & Love, 2002; Salomon & Shaver, 2005a). Innovation is critical for the firms' survival and long-term success (Evangelista *et al.*, 1997; O'Regan *et al.*, 2006; Yam *et al.*, 2004). It is recognized as a key source of competitive advantage (e.g., Weerawardena & O'Cass, 2004), productivity improvement and growth in international markets (e.g., Akman & Yilmaz, 2008; Salomon & Shaver, 2005b; Wang *et al.*, 2008).

A significant gap in the literature is the fact that studies are based on a single or a very small number of indicators to fully capture the nature of the innovation capability (Hollenstein, 1996). But innovation requires the combination of more than one of these indicators to be successful (Guan & Ma, 2003). Additionally, there is little research about innovation capability in the export context, and most of it focuses on innovation outputs (e.g., Cassiman & Golovko, 2011; Roper & Love, 2002). To address these limitations, the main goal of this study is to identify the key elements of innovation capability to manufacturing exporting firms. This way, we intend to help managers to recognize important drivers of innovation that lead firms to accomplish a superior performance in export markets.

## 2. Theoretical background

Due to its importance in management research, innovation has been studied by many authors. Therefore, there are various definitions to this concept. Thompson (1965) defines innovation as "*the generation, acceptance, and implementation of new ideas, processes, products, or services*" (p. 36). The innovation activity is a complex process that occurs over several stages, ranging from basic research to market penetration of new products (Hollenstein, 1996, 2003). The diversity of innovation activity translates into a set of typologies and degrees related to the firms' practices and strategies (Damanpour *et al.*, 2009). Innovation types are classified as technological - in products or processes - and non-technological - in marketing or organizational (Evangelista & Vezzani, 2010). These four types of innovation are present and often coexist both in industry and in services (Hollenstein, 2003; Tether & Tajar, 2008).

We propose that innovativeness, technological capability, innovation strategy and new product development capability are complex bundles of skills and accumulated knowledge that become embedded as organizational capabilities and enable firms to transform innovation resources into valuable outcomes in export market (Amit & Schoemaker, 1993; Day, 1994; Grant, 1996).

### 2.1 Innovativeness

Innovativeness describes "*a firm's propensity to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes*" (Lumpkin & Dess, 1996, p. 142). It is a critical part of innovation process, where is particularly relevant the cultural "*openness to innovation*" (Zaltman *et al.*, 1973, p. 64). Innovativeness is one important factor for the firm's survival and success (Doyle, 1998; Hult *et al.*, 2004). Previous research describes innovativeness as a key determinant for innovation outcomes (Hurley & Hult, 1998), positional advantage (Hult & Ketchen, 2001), and firm's performance (Calantone *et al.*, 2002; Hult, *et al.*, 2004; Rhee *et al.*, 2010). Innovativeness encompasses the generation and implementation of creative ideas within a firm (Amabile *et al.*, 1996; Calantone, *et al.*, 2002; Jong & Hartog, 2007; Zhao *et al.*,

2005). It requires the adoption of a new mind-set or attitude that needs to be shared and disseminated to all areas of the firm to be effective (Menguc & Auh, 2006). Therefore, the workers' participation in improvement activities along with the creation of new ideas are important factors when evaluating export firm's innovativeness (Martínez-Román *et al.*, 2011).

## **2.2 Technological capability**

In export markets, competitive advantage results from the firm's ability to develop new technologies more rapidly than its competitors, and to promote the creation and dissemination of technological innovations (Guan & Ma, 2003). Technological capability is the accumulation of technological knowledge used by firms to develop new products or improve existent ones (Kyläheiko *et al.*, 2011). This capability enables a company to introduce new products in the market, reduce production costs, ensure more competitive prices, and in turn achieve a superior performance (Kafourous *et al.*, 2008). Technological capability is usually measured by firms' Research and Development (R&D) activity (e.g., Kyläheiko, *et al.*, 2011; Zahra, 1996). R&D activity is a resource-based investment and represents the most important intangible innovation expenditure (Evangelista, *et al.*, 1997; Roper & Love, 2002). Indicators of a superior technological capability, such as extensive R&D projects, reflect the firm's investment in knowledge creation (Renko *et al.*, 2009), and its ability to adopt potential technologies and different approaches when developing new technology (Guan & Ma, 2003). Consequently, a firm is more able to recognize the opportunities to apply its long-term know-how into new products for the marketplace (Kyläheiko, *et al.*, 2011; Renko, *et al.*, 2009).

## **2.3 Innovation strategy**

The link between innovation and strategy is essential for an efficient innovation management (Akman & Yilmaz, 2008). The innovation strategy reflects the way firms formulate, implement and monitor their innovation strategy (Cohen & Cyert, 1973). A successful strategy entails an effective framework to ensure that operational behavior is aligned with the intended strategic behavior (Saleh & Wang, 1993). The impact of innovation strategy on firm's performance often depends on the internal cooperation between the various functional departments (Clercq *et al.*, 2008; Poon & MacPherson, 2005). This implies that the different parts are willing to accept, sometimes, conflicting viewpoints, and develop healthy working relationships (Luca & Atuahene-Gima, 2007). A firm with more formal innovation strategies is better prepared to implement and adopt tools and techniques related to innovation activities (Nijssen & Frambach, 2000). Formalization through organizational procedures and standards will improve the clarity of the standards, and results in a superior commitment of employees (Shrivastava & Grant, 1985). Through the motivation and the ability of human capital is possible to produce more creative ideas, develop innovative approaches and seize new market opportunities (Scarborough, 2003).

## **2.4 New product development capability**

New product development capability indicates the firms' ability to develop and manage new products to the export markets (Zou *et al.*, 2003). A successful new product development implies that firms are strongly committed to innovation, combining efforts and allocating important resources to innovation practices (Nijssen *et al.*, 2006). The ability to develop and manage new products offer helps firms to differentiate their products from competitors on international markets (Blesa *et al.*, 2008; Lisboa *et al.*, 2011). Developing new products affect the way customers perceive new product capability to fit with their market needs (Verona, 1999). New product development capability is a process that links technology, internal R&D and customers' needs by providing customers' benefits through the product's attributes

(Danneels, 2002). Additionally, this capacity reflects the firms involvement in turning out more new products in the market (Nijssen & Frambach, 2000).

### **3. Methodology**

The study was conducted in 2012, using a sample of Portuguese exporting firms. The study focuses exclusively on exporters manufacturing firms (e.g., Morgan *et al.*, 2004). A random sample of 3000 firms was selected from the Trade & Investment Agency (AICEP Portugal Global) government database. An online questionnaire, developed from the open source software “LimeSurvey”, was the basis of the data used to test the model. The firms were invited to participate in the project by e-mail. The final sample size was 2740 firms. We obtained 471 valid questionnaires, which corresponds to a response rate of 17%. This is a very satisfactory response rate, given that the average top management survey response rates is in the range of 15% to 20 % (Menon *et al.*, 1996).

The research instrument was created based on a literature review on the major subjects pertaining to this study. The translation was performed using the method of back translation to ensure accuracy (Brislin, 1970). In order to improve content validity and questionnaire clarity, a pre-test was conducted to a sample of 10 managers responsible for the export operations of their companies. The results contributed to the refinement of the questionnaire.

### **4. Data analysis**

To refined the measures and assess the reliability and validity of the constructs, the items were subjected to an exploratory factor analysis followed by a confirmatory factor analysis, using full-information maximum likelihood estimation procedures in LISREL 8.8 (Jöreskog & Sörbom, 1993). In this model, each item was restricted to load on its priori specified factor, with the factors themselves allowed to correlate with each other. The overall chi-square for this model is significant ( $\chi^2=188.39$ ,  $df=59$ ,  $p<0.00$ ). Additional measures of fit were examined: the comparative fit index (CFI=0.97), the incremental fit index (IFI=0.97), the Tucker-Lewis fit index (TLI=0.97), and the root mean square error of approximation (RMSEA=0.068). The results suggest a good fit between the model and the data.

In order to assess nomological validity, we tested the relation between our constructs scale and another constructs not included in the model but which they are theoretically related in prior research (Churchill, 1995). According to the literature, there are theoretical and empirical arguments to expect a positive relationship between innovation capability and performance.

Nomological validity would be supported if the measures of innovation practices positively and significantly correlated with annual export venture financial performance, annual export venture strategic performance and annual export venture achievement. The results support the prediction that these constructs are positively related to one another. All coefficients are positive and significant (at  $p<0.01$ ). Therefore, we can conclude that the nomological validity of the proposed constructs scale is supported (Hair *et al.*, 2010).

A second-order factor model of innovation capability was also estimated. This higher-order factor is introduced as the cause of the four innovation capabilities measured by reflexive items. The model includes the first-order factors (innovativeness, technological capability, innovation strategy and new product development capability), along with their standardized coefficients, observable indicators and measurement errors.

The first-order factors has significant (at  $p<0.01$ ) loadings of 0.80, 0.79, 0.59 and 0.74, respectively, on the second-order factor. The  $\chi^2$  for the second-order model is significant ( $\chi^2=189.48$ ,  $df=61$ ,  $p<0.00$ ). The model has good fits: comparative fit index (CFI=0.97), the incremental fit index (IFI=0.97), the Tucker-Lewis fit index (TLI=0.97), and the root mean square error of approximation (RMSEA=0.067). The  $\chi^2$  difference test between the first-order

and second-order models is not significant ( $\Delta\chi^2 = 1.09$ ,  $\Delta df = 2$ ), suggesting that the higher-order model accounted for the data well (Hair, et al., 2010).

## **5. Discussion and implications**

In order to succeed with respect to export development strategies programs it is important to identify the key components of exporting firms' capacity to innovate. Despite the importance and the considerable amount of research on innovation capability, there was a significant gap in the literature on this subject. Develop and maintaining the appropriate innovation capability is crucial for exporting firms' success. Therefore, it is essential to understand innovation capability used by manufacturing firms regarding their activities in export markets. The INNOVSCALE provides a more comprehensive way of understanding and measuring innovation capability.

Firm's perception of differences on innovativeness, technological capabilities, innovation strategy as well as new product development capability should be taken into account to fully grasp the concept. In other words, innovation capability is a higher-order construct composed of innovativeness, technological capabilities, innovation strategy and new product development capability dimensions that should be assessed at the individual level.

In order to expand research in this field, we present innovation capability not as a uni-dimensional construct, but as a set of various measurement items for each of the four dimensions, rather than an index of formative indicators. This way we ensure that a variation of each element is reflected in a set of items. Similar to recent research on innovative capability (e.g., Guan & Ma, 2003; Terziovski, 2010), we also use reflective indicators and assume that a modification in the latent variable will change the items (Hair, et al., 2010).

From a managerial perspective, different reasons justify the need for an assessment of innovation capabilities in export markets. With globalization and a constantly changing environment, exporting to foreign markets is no longer an option but a matter of survival. Through innovation, exporting firms may extend their products' lifecycle, reduce their overall operating costs (e.g., costs associated with R&D and technology), increase their sales and sustain or improve their competitiveness in global market. By using INNOVSCALE, managers may understand better the main constituent elements of innovation capability, so that they may handle this process more efficiently and effectively.

This study also provides valuable recommendations on how to evaluate the quality of export firms by assessing their innovation capability. Stimulating the creation and implementation of new ideas and creative processes, managers can develop a culture of innovativeness within the firm. By strongly investing in R&D projects and using long-term know-how in such activities, managers develop technological capability. Managers can assure the appropriate strategy for develop innovation by formulating innovation strategy, and assuring internal cooperation and employees' commitment. For achieve a superior new product development capability, managers should explore R&D investments to speedily develop and launch new products for the export market. All these capabilities will generate a superior innovation capability that allows firms to respond effectively to the competitive and turbulent environment in foreign markets.

Innovativeness, technological capabilities, innovation strategy, and new product development capability are positively related with annual export venture performance. Managers must also emphasize the importance of innovation capability for the firm's success. Overall, our results support resource-based view (e.g., Barney, 1991; Newbert, 2007) linking innovation capability directly with export venture performance. As posited by resource-based view, the capabilities by which firms acquire and deploy innovation resources are the key to

explain performance differences in the same industry (Eisenhardt & Martin, 2000; Teece *et al.*, 1997).

The INNOVSCALE enables managers to well identify problem areas and recognize how value is created through these capabilities. If the aim is to enhance a firm's performance in the international arena, managers should focus more on specific dimensions of innovation capability once that will have a larger impact on the outcome variable. Furthermore, the INNOVSCALE encourages managers to adopt a wider view of the innovation capability, taking into consideration relationships between different functional areas within the firm. In sum, our goal is that INNOVSCALE will assist managers in developing better innovation capability as well as in planning more accurate and efficient innovation practices.

## 6. References

- Akman, G., & Yilmaz, C. (2008). Innovative capability, innovation strategy and market orientation: an empirical analysis in turkish software industry. *International Journal of Innovation Management*, 12(1), 69-111.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *The Academy of Management Journal*, 39(5), 1154-1184.
- Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organisational rent. *Strategic Management Journal*, 14(1), 33-46.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Blesa, A., Monferrer, D., Nauwelaerts, Y., & Ripollés, M. (2008). The effect of early international commitment on international positional advantages in Spanish and Belgian international new ventures. *Journal of International Entrepreneurship*, 6(4), 168-187.
- Brislin, R. W. (1970). Back translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3), 185-216.
- Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515-524.
- Cassiman, B., & Golovko, E. (2011). Innovation and internationalization through exports. *Journal of International Business Studies*, 42(1), 56-75.
- Chadha, A. (2009). Product cycles, innovation, and exports: a study of indian pharmaceuticals. *World Development*, 37(9), 1478-1483.
- Churchill, G. A. (1995). *Marketing Research: Methodological Foundations*. Chicago: The Dryden Press.
- Clercq, D. D., Menguc, B., & Auh, S. (2008). Unpacking the relationship between an innovation strategy and firm performance: The role of task conflict and political activity. *Journal of Business Research*, 62(11), 1046-1053.
- Cohen, K. J., & Cyert, R. M. (1973). Strategy: Formulation, Implementation, and Monitoring. *The Journal of Business*, 46(3), 349-367.
- Damanpour, F., Walker, R. M., & Avellaneda, C. N. (2009). Combinative Effects of Innovation Types and Organizational Performance: A Longitudinal Study of Service Organizations. *Journal of Management Studies*, 46(4), 650-675.
- Danneels, E. (2002). The dynamics of product innovation and firm competences. *Strategic Management Journal*, 23(12), 1095-1121.
- Day, G. S. (1994). The capabilities of market-driven organizations. [Article]. *Journal of Marketing*, 58(4), 37-52.
- Doyle, P. (1998). Innovate or die. *Marketing Business*, 20-23.
- Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal*, 21(10-11), 1105-1121.

- Evangelista, R., Perani, G., Rapiti, F., & Archibugi, D. (1997). Nature and impact of innovation in manufacturing industry: some evidence from the Italian innovation survey. *Research Policy*, 26(4-5), 521-536.
- Evangelista, R., & Vezzani, A. (2010). The economic impact of technological and organizational innovations. A firm-level analysis. *Research Policy*, 39(10), 1253-1263.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. [Article]. *Strategic Management Journal*, 17(Winter Special Issue), 109-122.
- Guan, J., & Ma, N. (2003). Innovative capability and export performance of Chinese firms. *Technovation*, 23(9), 737-747.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River: Pearson Prentice Hall.
- Hollenstein, H. (1996). A composite indicator of a firm's innovativeness. An empirical analysis based on survey data for Swiss manufacturing. *Research Policy*, 25(4), 633-645.
- Hollenstein, H. (2003). Innovation modes in the Swiss service sector: a cluster analysis based on firm-level data. *Research Policy*, 32(5), 845-863.
- Hult, G. T. M., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33(5), 429-438.
- Hult, G. T. M., & Ketchen, D. J. (2001). Does market orientation matter?: a test of the relationship between positional advantage and performance. *Strategic Management Journal*, 22(9), 899-906.
- Hurley, R. F., & Hult, G. T. M. (1998). Innovation, Market Orientation, and Organizational Learning: An Integration and Empirical Examination. *Journal of Marketing*, 62(3), 42-54.
- Jong, J. P. J., & Hartog, D. N. D. (2007). How leaders influence employees' innovative behaviour. *European Journal of Innovation Management*, 10(1), 41-64.
- Jöreskog, K. G., & Sörbom, D. (1993). *LISREL 8: Structural equation modeling with the SIMPLIS command language*. Chicago: Lawrence Erlbaum Associates.
- Kafouros, M. I., Buckley, P. J., Sharp, J. A., & Wang, C. (2008). The role of internationalization in explaining innovation performance. [Article]. *Technovation*, 28(1-2), 63-74.
- Kyläheiko, K., Jantunen, A., Puumalainen, K., Saarenketo, S., & Tuppurä, A. (2011). Innovation and internationalization as growth strategies: The role of technological capabilities and appropriability. *International Business Review*, 20(5), 508-520.
- Lisboa, A., Skarmeas, D., & Lages, C. (2011). Entrepreneurial orientation, exploitative and explorative capabilities, and performance outcomes in export markets: A resource-based approach. *Industrial Marketing Management*, 40(8), 1274-1284.
- Luca, L. M. D., & Atuahene-Gima, K. (2007). Market Knowledge Dimensions and Cross-Functional Collaboration: Examining the Different Routes to Product Innovation Performance. *Journal of Marketing*, 71(1), 95-112.
- Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the entrepreneurial orientation construct and linking it to performance. *The Academy of Management Review*, 21(1), 135-172.
- Martínez-Román, J. A., Gamero, J., & Tamayo, J. A. (2011). Analysis of innovation in SMEs using an innovative capability-based non-linear model: A study in the province of Seville (Spain). *Technovation*, 31(9), 459-475.
- Menguc, B., & Auh, S. (2006). Creating a firm-level dynamic capability through capitalizing on market orientation and innovativeness. *Journal of the Academy of Marketing Science*, 34(1), 63-73.

- Menon, A., Bharadwaj, S. G., & Howell, R. (1996). The quality and effectiveness of marketing strategy: Effects of functional and dysfunctional conflict in intraorganizational relationships. *Journal of the Academy of Marketing Science*, 24(4), 299-313.
- Morgan, N. A., Kaleka, A., & Katsikeas, C. S. (2004). Antecedents of Export Venture Performance: A Theoretical Model and Empirical Assessment. [Article]. *Journal of Marketing*, 68(1), 90-108.
- Newbert, S. L. (2007). Empirical research on the resource-based view of the firm: an assessment and suggestions for future research. *Strategic Management Journal*, 28(2), 121-146.
- Nijssen, E. J., & Frambach, R. T. (2000). Determinants of the Adoption of New Product Development Tools by Industrial Firms. *Industrial Marketing Management*, 29(2), 121-131.
- Nijssen, E. J., Hillebrand, B., Vermeulen, P. A. M., & Kemp, R. G. M. (2006). Exploring product and service innovation similarities and differences. *International Journal of Research in Marketing*, 23(3), 241-251.
- O'Regan, N., Ghobadian, A., & Gallear, D. (2006). In search of the drivers of high growth in manufacturing SMEs. *Technovation*, 26(1), 30-41.
- Poon, J. P. H., & MacPherson, A. (2005). Innovation strategies of Asian firms in the United States. *Journal of Engineering and Technology Management*, 22(4), 255-273.
- Renko, M., Carsrud, A., & Brännback, M. (2009). The Effect of a Market Orientation, Entrepreneurial Orientation, and Technological Capability on Innovativeness: A Study of Young Biotechnology Ventures in the United States and in Scandinavia. *Journal of Small Business Management*, 47(3), 331-369.
- Rhee, J., Park, T., & Lee, D. H. (2010). Drivers of innovativeness and performance for innovative SMEs in South Korea: Mediation of learning orientation. *Technovation*, 30(1), 65-75.
- Roper, S., & Love, J. H. (2002). Innovation and export performance: evidence from the UK and German manufacturing plants. [Article]. *Research Policy*, 31(7), 1087-1102.
- Saleh, S. D., & Wang, C. K. (1993). The management of innovation: strategy, structure, and organizational climate. *IEEE Transactions on Engineering Management*, 40(1), 14-21.
- Salomon, R. M., & Shaver, J. M. (2005a). Export and domestic sales: their interrelationship and determinants. *Strategic Management Journal*, 26(9), 855-871.
- Salomon, R. M., & Shaver, J. M. (2005b). Learning by Exporting: New Insights from Examining Firm Innovation. *Journal of Economics & Management Strategy*, 14(2), 431-460.
- Scarborough, H. (2003). Knowledge management, HRM and the innovation process. *International Journal of Manpower*, 24(5), 501-516.
- Shrivastava, P., & Grant, J. H. (1985). Empirically derived models of strategic decision-making processes. *Strategic Management Journal*, 6(2), 97-113.
- Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319-1350.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. [Article]. *Strategic Management Journal*, 18(7), 509-533.
- Terziowski, M. (2010). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: a resource-based view. [Article]. *Strategic Management Journal*, 31(8), 892-902.

- Tether, B. S., & Tajar, A. (2008). The organisational-cooperation mode of innovation and its prominence amongst European service firms. *Research Policy*, 37(4), 720-739.
- Thompson, V. A. (1965). Bureaucracy and innovation. *Administrative Science Quarterly*, 10(1), 1-20.
- Verona, G. (1999). A RESOURCE-BASED VIEW OF PRODUCT DEVELOPMENT. [Article]. *Academy of Management Review*, 24(1), 132-142.
- Wang, C.-h., Lu, I.-y., & Chen, C.-b. (2008). Evaluating firm technological innovation capability under uncertainty. *Technovation*, 28(6), 349-363.
- Weerawardena, J., & O'Cass, A. (2004). Exploring the characteristics of the market-driven firms and antecedents to sustained competitive advantage. *Industrial Marketing Management*, 33(5), 419-428.
- Yam, R. C. M., Guan, J. C., Pun, K. F., & Tang, E. P. Y. (2004). An audit of technological innovation capabilities in chinese firms: some empirical findings in Beijing, China. *Research Policy*, 33(8), 1123-1140.
- Zahra, S. A. (1996). Technology strategy and financial performance: Examining the moderating role of the firm's competitive environment. *Journal of Business Venturing*, 11(3), 189-219.
- Zaltman, G., Duncan, R., & Holbek, J. (1973). *Innovations and Organizations*. New York: Wiley.
- Zhao, H., Tong, X., Wong, P. K., & Zhu, J. (2005). Types of technology sourcing and innovative capability: An exploratory study of Singapore manufacturing firms. *The Journal of High Technology Management Research*, 16(2), 209-224.
- Zou, S., Fang, E., & Zhao, S. (2003). The Effect of Export Marketing Capabilities on Export Performance: An Investigation of Chinese Exporters. [Article]. *Journal of International Marketing*, 11(4), 32-55.