THE INFLUENCE OF STRENGTHENING AND HAMPERING INNOVATION FACTORS ON FIRM'S PERFORMANCE

Nertila BUSHO

Phd student

MBA, Department of Management, Faculty of Economy, University of Tirana, Albania

nertilabusho@feut.edu.al

Abstract

This paper evaluates the influence of strengthening and hampering innovation factors into firm performance. Results are reported utilizing a sample of 428 firms operating in four non-EU countries and four EU countries. The empirical results of these two subsamples confirm that different variables are significant predictors of performance for firms operating in EU countries compared to of non-EU countries. More specifically, cost factors negatively impact firm performance for both EU and non-EU samples. Market and knowledge factors significantly impact firm performance of respectively non-EU and EU countries. Furthermore, export orientation for firms in non-EU countries and cooperation with other enterprises or institutions for firms in EU countries significantly impact firm performance. The results of this paper do have important implications in policy level which are discussed at the end of the paper.

Keywords: Innovation, Hampering factors, Strengthening factors, Firm, Performance

INTRODUCTION

Innovation has been a topic of interest for academics, governments and obviously, firms since a long time. The benefits of innovation are clear and widely investigated by researchers and practitioners. Innovation contributes to the national economic growth and it is a prominent source of sustainable competitive advantage (Romer 1985; Porter, 1990; Drew, 1997). Innovation has a positive impact on firm's performance (Han, Kim and Srivastava, 1998;

Cainelli, Evangelista and Savona, 2003) and it is a fundamental aspect of competition (Baumol, 2002).

Lately, the topic of innovation has gained increasing importance in the context of globalization and intensification of competition between firms. Various scholars argue that besides organizational characteristics and managerial attitudes, the external environment has a significant impact on innovation and ultimately firm's performance (Porter, 1990). Damanpour (1996) argues that innovation is either a response to changes in the external environment or a pre-emptive action to influence the environment. D'Este, Iammarino, Savona and Tunzelmann, (2011) identified different factors hampering innovation, while other researchers underline the positive effect of collaborative networks (Hagedoorn 2002) and the export orientation of firms (Salmon and Shaver, 2005) on innovation and ultimately on firm performance.

Considering the importance of the innovation and the role of the external environment on the capacity of firms to innovate, our paper focuses on the effect of both strengthening and hampering innovation factors on firm's performance. In more detail, we focused on two strengthening factors of innovation - network collaboration (Hagedoorn 2002) and export orientation (Salmon and Shaver, 2005) and four hampering factors of innovation - market, technological, human resource lack of reasons to innovate (D'Este, Iammarino, Savona and Tunzelmann, 2011; Sipos, Bizoi and Ionescu, 2013).

The comparative approach used in this study points out the importance of the context and its relationship with firm's performance. As argued by Prahalad, (2012) emerging and developing market tend to be radically different from developed ones. Consequently, we can argue that strategies adopted by firms in the realm of innovation, and arguably not only, are different. In sum, the aim of this study is to compare the impact of strengthening and hampering innovation factors on firm's performance in EU and non-EU countries.

Our study contributes to the literature on innovation by increasing knowledge of the external factors effect on the performance of firms based in developing and developed economies. Furthermore, this study sheds some light into the role played by the context using firm's lens.

This paper is organized in five sections. Section 2 reviews the theoretical background and presents the hypotheses. Section 3 describes the analyses, data, method used, and empirical model proposed by the authors. Section 4 discusses empirical research findings, and the paper ends with the discussion, conclusions, further research recommendations and study limitations.

THEORETICAL BACKGROUND

Innovation - a definition and typologies

Innovation is not a new phenomenon. A vast literature that tackles different patterns of innovation is already available. Schumpeter (1934), a pioneer in the economic analysis of innovation, described it as a new combination of existing resources. Drucker (1985) defined innovation as change that creates a new dimension of performance. Damanpour (1996) considers it as a means of changing an organization.

There are a large number of innovation typologies. Schumpeter (1934) argues that innovation can be break down into the following categories: new products, new methods of production, new sources of supply, exploration of new markets and new ways to organize a business. Other researchers like Zaltman et al. (1973) explore twenty types of innovation in the context of organization. Meeus and Edquist (2006) argue about four types of innovation applicable at service organizations - service innovation, process innovation, technological process innovation and administrative process innovation. Hamel (2006) distinguished two types of innovation: innovation in operational processes and innovation in management processes. Damanpour (1996) provides a longer definition of innovation which consists of new product or service, new process technology, new organization structure or administrative systems, or new plans or program pertaining to organization members.

The role of innovation strengthening factors on performance of firms

The network in which firms operate have a strong impact on their performance. Generally, the cooperation with the other institutions or other companies help firms scale up their profit through economies of scale, cost sharing, access to complementary technology, risk sharing and fast development (Hagedoorn 2002; Bonteand and Keibach 2005; Faria, Lima and Santos 2010). On the other hand, exporting firms can easily absorb know-how and receive cutting edge technologies to adopt in their production process increasing their performance (Salmon and Shaver, 2005). There is a positive association between firm's productivity and exporting. (Katsikeas and Leonidous, 1996; Wagner, 2007). Hence, we posit:

H1. The higher the cooperation on innovation activities between firms or institutions the higher the firm's performance.

H2. The more export oriented a firm is, the higher the firm's performance.

The role of innovation hampering factors on performance of firms

Certain problems are not effectively encountered until firms face them. Only when firms undertake investments leading to some type of innovation, the chances to face innovation

barriers increase (Galia and Legros, 2004). Hence, it is important for innovative firms to be aware of the influence the barriers of innovation have in their profit and figure the best manner to effectively encounter them. As argued by Sipos, Bizoi and Ionesku (2013) the impact of these barriers or hampering factors is strongly and negatively correlated with firms' performance.

Factors that can hamper innovation: the lack of qualified personnel; the lack of information in technology; the lack of information on markets; the difficulty in finding cooperation partners; market dominated from established enterprises; uncertain demand for innovative good and service; no need to innovate due to prior innovation; no need to innovate due to no demand; the luck of funds within the enterprise or group; the luck of external financial sources; the high costs of innovation (Eurostat, 2014).

It is clear that firms need to invest on new ideas, new procedures and new products, but sometimes because of the complex of processes, cost of investment is quite high. Several studies conducted in European countries show that cost factors have a strong impact on innovative activities (Canepa and Stoneman, 2008). Savignac (2006) argues that the adoption of innovation is significantly related with the presence of financial constraints. Following this line of reasoning we advance the following hypothesis:

H3. The increase of cost factors which hamper innovation, lowers firm's performance.

Another factor that hampers innovation is the lack of human capital. The detrimental effect of lack of expertise and organizational skills on innovation performance in manufacturing-intensive sectors has been extensively confirmed by empirical research (Gort and Klepper, 1982). On the other hand, lack of skilled workers with competencies and knowledge is a strong barrier to firms in the service sector (Iammarino et al., 2009). In general, knowledge barriers can limit the capacity to introduce a new product/service (ibid.). Spithoven et al. (2013) argues that SMEs, compared to large firms, are unable to fully benefit from innovation since they do not have the same in-house capabilities to assimilate the external knowledge. Hence, we advance the following:

H4. The increase of knowledge factors that hamper innovation lowers firm's performance.

Market factors such as to level of competition, the small size of the firm compared to its competitors, etc may impose severe constraints to firm's capacity to innovate and hinder its commitment to innovation activity (Iammarino et al., 2009). Market uncertainty such as ambiguity about the size of potential market for new products, the rate of diffusion of these products, industry standards, etc. innovation has proved to affect a consumer's acceptance towards innovation and ultimately the performance of firms (Hoeffler, 2003). Based on this evidence, we posit:

H5. The increase of market factors that hamper innovation lowers firm's performance.

Among the hampering factors that affect innovation is lack of reasons to innovate. Firms might operate in stable markets with few process and product innovation. While market uncertainty might be low the low appropriated rents can contribute negatively to the firm performance, Hence, we advance the following:

H6. The lack of reasons to innovate, lowers firm's performance.

RESEARCH METHODOLOGY

The study

The empirical research was conducted to see who are the hampering and strengthening factors to innovation that contribute on firms performance, in the same time to compare if those factors has the same implication on firms performance for both subsample.

Data

The sample consists of 428 innovative firms randomly selected using stratified random sampling method. The sample was randomly selected following the suggested and approved sample characteristics (50% production firms and 50% service companies and 15% micro, 35% small and 50% medium sizes) applied in similar research such as Community Innovation Survey (CIS). Sampling was broken down in three size related categories: micro, small and medium size.

Considering the comparative nature of our study the sample has been divided in two subsamples; the first included 231 firms located in four non-EU countries, namely Albania, Bosnia and Herzegovina, Montenegro and Serbia; the second includes 197 firms located in EU countries, namely Italy, Greece, Slovenia and Croatia.

Measurements

Details of the constructs, measurement and the operationalization of variables are provided in Appendix A and are discussed below.

Dependent variable

Business performance. Business performance measurement was assessed based on the average of five items, namely market share, revenues, profit, cash flow and costs reduction (Slater and Olson, 2000; Auh and Merlo 2012). Respondents were asked to rate their business performance compared to their most direct competitor (Auh and Merlo, 2012) taking into account only last three years. The five-item construct yielded a Cronbach Alpha of 0.876

(standardized Cronbach Alpha coefficients), follows thin accordance with the recommended criteria (Nunnally 1978).

Factors strengthening innovation

Cooperation. Co-operation in innovations in this study is viewed as an active participation with other enterprises or institutions in innovation activities during the three years, 2011, 2012 and 2013. Outsourced services have been excluded.

Export orientation. Export orientation was measured as firm's current number of active export countries for 2013.

Factors hampering innovation

Following D'Este, Iammarino, Savona, Tunzelmann (2011) and Șipoșa, Bîzoib, Ionescu, (2013) we operationalized the four factors that hamper innovation, namely cost, knowledge, market and lack of reasons, as follows:

Cost factors. The construct *cost factors* using three items: (1) lack of funds within the firm (2) lack of external financial resources and (3) high innovation (ibid.). The three-item construct yielded a Cronbach Alpha of 0.765.

Knowledge factors. The construct *knowledge factors* are operationalized using three items: lack of (1) qualified personnel, (2) information on technology (3) information on markets (ibid.). The three-item construct yielded a Cronbach Alpha of 0.769.

Market factors. The construct *knowledge factors* are operationalized using three items: (1) Difficulty in finding cooperation partners for innovation, (2) market dominated by established firms, (3) uncertain demand for innovative goods or services (ibid.). Cronbach Alpha is acceptable, at 0.710.

Lack of reasons to innovate. The construct *Lack of reasons to innovate* is operationalized using two items: (1) no need to innovate due to prior innovations by your enterprise (2) no need to innovate because of no demand for innovations (ibid.). The two-item construct yielded a Cronbach Alpha of 0.804.

Control variable

Firm size. Considering the unreliability of data related to firm's turnover we chose number of employees as a proxy to firm size. We operationalized size as a logarithm of number of employees. Firm size is an important factor affecting firm survival and performance (Porter, 1990). Innovative small firms appear to be more affected by hampering factors compared to medium and large firms (OECD, 2011).

Empirical Model

We analyze the data using linear multivariate regression techniques. Equation (1) shows the general form of a multiple regression model with *k* predictors.

$$Y = b_0 + b_1 X_1 + b_2 X_2 + ... + b_k X_k$$

(1)

Although our study is focused primarily on which predictors have an effect on our criterion variable, the comparing coefficients of the two sub-samples is a secondary objective of our analysis. Cohen (1983) suggests large samples and the inclusion of all k variables for each subsample, regardless of their significance, in order to compare the fitted regression coefficients. Our sample is quite large, and all variables have been included for each sub-sample.

Construct Validity for the two Business Themes

We performed a factor analysis with varimax rotation to test the validity of our independent perceptual variables (see appendix B) (Tabachnick and Fiddell, 2007). The results for cost factors loaded reasonably high (.875, .860, .634). One item namely *lack of qualified personnel* loaded into the knowledge factors, despite being originally accounted as an item which measures cost factors. *Difficulty in finding cooperation partners for innovation* originally accounted to measure knowledge factors loaded into market factors. The remaining three factors loaded high (.795, .809, .701). The three items for market factors (the two initial ones plus the one that loaded into this factor) loaded high also (.667, .785, .772). Finally, the factors for lack of reasons to innovate loaded high (.858, .875). Loadings are above the acceptable standard of 0.32 proposed by Tabachnick and Fiddell (2007). After the validity tests, we concluded that the measures could be accepted to test the hypotheses.

RESULTS

Table 1 depicts the results related to our hypotheses, the result of the regressions for both subsamples.

Table 1. Regression results for the two subsamples

Variables	Dependent variable - Performance					
	Non-EU coutries			EU countries		
	B	S.E.	Beta	B	S.E.	Beta
Constant	5.076 ***	.370		4.626 ***	.276	
Ln (size)	.090	.062	.096	.083†	.061	.103

Cooperation	.067	.155	0.27	.348*	.150	.153
Export orientation	.118**	.043	.171	.040	.033	.090
Cost factors	-.100*	.038	-.183	-.115***	.030	-.276
Knowledge factors	.057	.040	.107	-.090*	.040	-.184
Market factors	-.136**	.041	-.241	.032	.039	.067
Lack of reasons to innovate	.079	.062	.092	.051	.049	.075
R Square		0.173			0.181	
Adjusted R Square		0.147			0.150	
F		6.684***			5.958***	

*0.01 ≤ p < 0.05, **p < 0.01, ***p < 0.001, †0.05 ≤ p < 0.1

Hypothesis 1 is supported for the EU countries subsample only. Cooperation on innovation activities between firms or institutions has a significant and positive impact on firm's performance. While, for the non-EU subsample, despite being in the right direction, the relationship is not significant.

Hypothesis 2 is supported for the non-EU countries subsample only. Non-EU export-oriented firms appear to have a better performance compared to those who serve domestic markets only. While there is no significant relationship between export orientation and performance for EU firms.

Hypothesis 3 is supported for both subsamples. Moreover, unstandardized betas are alike indicating a similar effect of cost factors on firm's performance. Cost factors negatively affect performance for both EU and non-EU firms.

Hypothesis 4 is supported for EU subsample only. Knowledge factors have a negative effect on performance of EU firms. The effect is not significant for the non-EU subsample. Even more, the sign is opposite to the one hypothesized.

Hypothesis 5 is supported for non-EU subsample only. Market factors have a strong negative impact on non-EU firm's performance. The relationship for EU firms is not significant.

Hypothesis 6 is rejected for both sub-samples. Contrary to the prediction, the parameter estimates for lack of reasons to innovate is not statistically significant.

There is a positive relationship between our control variable-firm size and performance for the EU subsample, although only at a relaxed level (p<0.1). Large EU firms appear to perform better than smaller one.

The R-square indicates that around 17% of the response variable variation is explained by the model for the non-EU subsample and more than 18% for the EU subsample. Considering that

our independent variables can be used as covariates in future studies, our model appears to be very useful when analysing other explanatory factors of performance.

CONCLUSIONS AND IMPLICATIONS

Cooperation between business partners and institutions appear to be a crucial factor to foster innovation among EU firms but not among non-EU firms. This result is indicative of the different managerial attitudes among managers of EU-firms and the different nature of inter-firm relationship in EU countries compared to non-EU ones. Further research is necessary to explore the phenomena of cooperation and the role of networks.

Export orientation of firms in non-EU countries has a significant positive impact on performance. We can deduct that these firms are more inclined to adopt the latest innovation and practices. Policy makers of non-EU countries should find adequate instruments and mechanisms to support innovation among export-oriented firms and/or those aiming to target export markets.

As expected, cost factors have a significant negative impact on firm's performance in non-EU countries and in EU countries. Innovation is costly, and many firms cannot afford it. Specific programmes targeting innovation should be implemented. More importantly, considering the weak funding of existing programmes, EU or state-owned agencies need to increase funding.

Knowledge factors have no significant effect on firm's performance in non-EU countries, while it has a significant and large effect (see beta (Keith's (2006)) for EU countries. In efficiency lead economies of the four non-EU countries, knowledge factors do not play an important role but in EU countries, which are expected to have a knowledge-oriented economy, it does. These results are noteworthy. A question for new research might be raised -What about the role of human capital as a source of competitiveness in the long run?

Market factors have a negative and significant impact on firm's performance in non-EU countries but not in EU countries. High level of market concentration and lack of competition might create a substantial obstacle for firm's competitiveness. Hence, improving market dynamics in non-EU countries is a priority.

STUDY LIMITATIONS

One of the limitations of the study is related to the missing data for some of our variables. Although missing values are not high (around 5-15%), it appears that in one case (one item excluded from the analyses) data are not missing completely at random. In addition, our study does not include into the analysis's different facets of innovation. Despite our effort to address

the hampering and strengthening factor - performance link, we did not provide any evidence of the role that innovation itself plays in this relationship. Finally, more firm level, industry or strategy controls are needed to ensure that the captured effect can be attributed to the independent variables.

ACKNOWLEDGEMENTS

APPENDICES

Appendix A: Details of constructs and measures

Variable			Number of items	Measurement
Dependent variable				
Performance	a)	Market share compared to the most direct competitor	5	7-points scale (1 = much worse, 4 = equal, 7= much better)
	b)	Revenues compared to the most direct competitor		
	c)	Profit compared to the most direct competitor		
	d)	Cash flow compared to the most direct competitor		
	e)	Decrease costs compared to the most direct competitor		
Independent variables				
Cooperation	Active participation with other enterprises or institutions on innovation activities		1	*Dummy*, 1= cooperation in the last three years, 0 = no cooperation in the last three years
Export orientation	Current number of active export countries for 2013.		1	Continues (ratio variable) with zero meaning - no export.
Cost factors	a)	Lack of funds within your enterprise or group	3	Ratio variable (4-points scale (0-factor not experienced, 1 = low, 2 = medium, 3 = high)
	b)	Lack of finance from sources outside your enterprise		
	c)	Innovation costs too high		
Knowledge factors	a)	Lack of qualified personnel	3	Ratio variable (4-points scale (0-factor not experienced, 1 = low, 2 = medium, 3 = high)
	b)	Lack of information on technology		
	c)	Lack of information on markets		

Market factors	a) Difficulty in finding cooperation partners for innovation b) Market dominated by established enterprises c) Uncertain demand for innovative goods or services	3	Ratio variable (4-points scale (0-factor not experienced, 1 = low, 2 = medium, 3 = high)
Lack of reasons to innovate	a) No need due to prior innovations by your enterprise b) No need because of no demand for innovations	2	Ratio variable (4-points scale (0-factor not experienced, 1 = low, 2 = medium, 3 = high)
Control variable			
Firm size	Number of employees	1	Logarithem of number of employees

Appendix B: Factor Analysis with Varimax Rotation

	Factor*			
Items of four constructs	F1	F2	F4	F4
Lack of funds within your enterprise or group	.145	**.875**	.056	.107
Lack of finance from sources outside your enterprise	.046	**.860**	.136	.100
Innovation costs too high	.200	**.634**	.346	.046
Lack of qualified personnel	**.795**	.145	.068	.147
Lack of information on technology	**.809**	.089	.227	.210
Lack of information on markets	**.701**	.137	.338	.182
Difficulty in finding cooperation partners for innovation	.357	.197	**.667**	-.022
Market dominated by established enterprises	.103	.134	**.785**	.104
Uncertain demand for innovative goods or services	.166	.131	**.772**	.252
No need due to prior innovations by your enterprise	.191	.105	.180	**.858**
No need because of no demand for innovations	.223	.110	.089	**.875**
Percentage variance explained	39.271	13.311	10.414	8.405

*Underlying dimensions as two factors: F1= cost factors, F2 = knowledge factors, F3 = market factors, F4

= lack of reason to innovate factors.

REFERENCES

Auh, S., & Merlo, O. (2012). The power of marketing within the firm: Its contribution to business performance and the effect of power asymmetry. Industrial Marketing Management, 41(5), 861-873.

Baumol, William J. (2002): Entrepreneurship, innovation and growth: The David-Goliath symbiosis, Journal of Entrepreneurial Finance, 7, Iss. 2, 1-10.

Bonte, W. & Keilbach, M. 2005. Concubinage or marriage? Informal and formal cooperations for innovation. International Journal of Industrial Organization, 23(3-4), 279-302

Cainelli, G., Evangelista., R., & Savona., M. (2003). The impact of innovation on Economic performance in services. The service industries journal (2004), 116-130.

Canepa, A., & Stoneman. P. (2008). Financial constraints to innovation in the UK: evidence from CIS2 and CIS3. Oxford University Press, 60(4), 711-730.

Cohen, A. (1983). Comparing regression coefficients across subsamples - a study of statistical tests. Sociological Methods and Research, 12(1), 77-94.

D'Este, P., Iammarion. S., Savona, M., & Tunzelmann, N. (2011). What hampers innovation? Revealed barriers versus deterring barriers. Research Policy, 41(2012), 482-488.

Damanpour, F. (1996). Organizational complexity and innovation: Developing and testing multiple contingency models. Management science, 42 (5), 693-716.

Drew, S. (1997). From knowledge to action: the impact of benchmarking on organizational performance. Long range planning, 30 (3), 427-441.

Drucker, P. (1985). Innovation and entrepreneurship. New York: Harper & Row

Eurostat, Hampered innovation activities 2014, http://ec.europa.eu/eurostat/documents/3433488/5304673/KS-NS-04-001-EN.PDF/c1412681-763d-4f44-9115-4a58dda4ec47?version=1.0

Faria, P. Lima, F and Santos, R. (2010). Cooperation in innovation activities: The importance of partners. Research policy 39, 1082-1092

Galia, F., Legros, D. (2004) Complementarities between obstacle to innovation: Evidence from France, Research Policy.

Gort, M., Klepper, S., 1982. Time paths in the diffusion of product innovation. Economic Journal 92, 630–653.

Hagedoorn, J. (2002). Inter firm R&D partnerships: an overview of major trends and patterns since 1960. Research policy 31, 477-492.

Han, J., Kim, N., & Srivastaca, R. (1998). Market orientation and organizational performance: Is innovation a missing link? Journal of marketing, 46 (4), 30-45.

Hoeffler, S. (2003), "Measuring preferences for really new products", Journal of Marketing Research, Vol. 40 No. 4, pp. 406-420.

Iammarino, S., Randacio, S. F., Savona, M. (2009). The perception of obstacles to innovation. Foreign multinationals and domestic firms in Italy. Revue D'economie Indutrielle, 75-104.

Katsikeas, C., &Leonidou. L. (1996). Export market expansion strategy: Differences between market concentration and market spreading. Journal of marketing management, 12.

Keith, F. Widaman. (2006). Missing data, what to do with or without them. Monographs of the society for research in child development, 71 (3), 42-64.

Meeus, M and Edquist, Ch (2006) In Innovation, Science and Institutional Change. A Research Handbook, 23-37.

Nunnally, JC. (1978). Psychometric Theory. (2nd ed.) New York: McGraw-Hill.

OECD, (2011). Innovative cluster - drivers of national innovation systems. OECD Publishing, Paris

Porter, M. E. (1990). New global strategies for competitive advantage. Planning Review 18 (3), 4-14.

Prahalad, C.K. (2012). Bottom of the Pyramid as a Source of Breakthrough Innovations. Product development & management association, 29(1), 6-12.

Romer. P (1985). Increasing returns and long run growth. Research center for economic research, 27.

Salmon, R., & Shaver, J. (2005). Learning by exporting: New insights from examining firm innovation. Journal of Economics & Management Strategy, 14, 431–460.

Savignac, F. (2006) The impact of financial constraints on innovation: evidence from French manufacturing firms. Cahiers de la Maison des Sciences Economiques, 42.

Schumpeter, J. (1934) The Theory of Economic Development, Cambridge,Mass: Harvard University Press.

Șipoș G. L., Bîzoi, G., & Ionescu, A. (2013). The Impact of Hampering Innovation Factors on Innovation Performance - European Countries Case. Procedia - Social and Behavioral Sciences 124 (2014) 415 – 424.

Slater, S. F., & Olson, E. M. (2000). Strategy type and performance. The influence of sales forces management. Strategic Management Journal, 21(8), 813–829.

Spithoven, A, Vanhaverbeke, W, & Roijakkers, N. (2013). Open innovation practices in SMEs and large enterprises. Small Business Economics, 41(3), 537–562.

Tabachnick, B. G., & Fidell, L. S. (2007). Using multivariate statistics (5th ed.). Boston: Allyn and Bacon.

Wagner, J. (2007). Export and productivity: A survey of the evidence form firm level data. The world economy, 30, 60-82.

Zaltman, Gerald, Robert L. Duncan, and Jonny Holbek (1973). Innovations and Organizations. New York: Wiley.