

INNOVATION AND INTERNATIONALIZATION AS A SINGLE STRATEGY OF THE FIRM: A UNIFICATION OF THEORIES

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ABSTRACT

Recently, innovation and internationalization strategies have explained firm success. Some authors argue that innovation settles internationalization while some others point that internationalization settles the firm's innovation level. This work unifies these theories, arguing that both are a single strategy of the firm. We also argue that both theories are founded in the same set of variables like technological capabilities, technology investment, alliances and firm decision structure. Tests are based on correlation and regression analysis. We demonstrate the existence of a relationship between innovation and internationalization that can't be explained by separating them into separate theories.

JEL: M10, M13, M16

KEYWORDS: Innovation, Internationalization, Firm Strategy, Technology, Alliances, Decision Making

INTRODUCTION

Recently, firm innovation as a strategy to succeed and perform in markets, has taken on increased importance. Since the coevolution of technology, firm decision structure and the links between universities and firms makes a more dynamic market (Grandstrand, 1998). This new market dynamic has increased the intensity of changes and uncertainty (Schwens and Kabst, 2011). These changes encourage firms to invest more resources for firm innovation.

This dynamic has important effects. Because of this market uncertainty, firms often exploit more technological knowledge (Autio and Yli-Renko, 1998). This knowledge allows firms to enter new niches of markets (Schwens and Kabst, 2011; Autio and Yli-Renko, 1998) or to access larger markets seeking growth opportunities. In this sense, innovation is the main motor of change mechanism to reach firm success.

Many firms enter new markets for diversifying failure risk because of evolution of technologies, information, communications, transport, openness of new markets and mobility of capital and human resources (Fong and Ocampo, 2010). This encourages firms to conduct more value chain operations in foreign countries (Welch and Luostarinen, 1988). This openness to new markets increases resources that firms spend in technology and innovation to access them (Dabic, Daim, Aralica and Bayraktaroglu, 2012; Schwens and Kabst, 2011; Kafouros, Buckley, Sharp and Wang, 2008; Autio and Yli-Renko, 1998). In fact, these authors point out that firm innovation is a determining factor in the firm's internationalization level.

The aim of this work is to show the relationship between innovation and internationalization strategies. On one side, some internationalization authors argue that internationalization settles the innovation level (Dabic, Daim, Aralica and Bayraktaroglu, 2012; Kafouros, Buckley, Sharp and Wang, 2008, Peng, 2001). On the other side some authors argue that innovation determines internationalization (Sigh and Gaur, 2013; Chen, 2012; Chadha, 2009; Roper and Love, 2002; Wakelin, 1998).

It is important to note that these relationships are ambiguous, since there is not yet a clear causal relationship between them. Nevertheless, there are some studies (Kylaheiko, Jantunen, Puumalainen, Saarenketo and

Tuppura, 2011) showing that technological capabilities are affecting in the same way strategies of innovation and internationalization. In this sense, both theories are conceptualized as different strategies to improve firm performance. Therefore it is pointed that, the actual relation between these strategies has not reached a consensus for the direction of the causal relationship, since one is important for the other. In this way the proposal is to signal that both strategies are part of a single strategy of the firm.

The research is organized as follows, first we present a literature review where we discuss the state of art for innovation and internationalization theories from the Resources Based View. Next we describe the method of regression models used and the data source for statistical testing. The next section shows the results and discussion and compares them to the existing literature. The last section provides concluding comments.

LITERATURE REVIEW

This literature review begins by studying the Resources Based View (RBV), since both strategies are involved in this corpus. On one side, firm internationalization has been impregnated by the RBV (Peng, 2001) arguing that firms achieving success must acquire and develop valuable and not substitutable resources (Barney, 1991). These resources must be configured for not being imitable (Tecee, Pisiano and Shuen, 1997). In this sense firms wishing to achieve success in international markets must get or develop important resources and configure them to develop an internationalization strategy.

On the other hand, literature on innovation activities is closely related to RBV (Grandstrand, 1998). Firms wishing to innovate must acquire and develop important intangible resources (Grant, 1998), as well as knowledge and technology. For firms to achieve success, they must develop and redevelop products and services offered to changing market conditions (Grandstrad, 1998, Fong and Alarcón, 2010).

In summary, RBV is a theoretical corpus that explains, in part, the development of innovations and firm internationalization, by means of important resources and capabilities configured to create a firm strategy. In this sense, when the firm enters new international markets it is acquiring new knowledge to develop or redevelop their products and services (Peng, 2001). This process directly impacts the firm's innovation system. On the other hand, development of products and services (Grandstrand, 1998), impacts directly on opportunities to entry in new international markets with a competitive advantage through the development of resources.

The lack of clear evidence on the causal relation between internationalization and innovation is a new question. The aim of this study is to describe this relationship. We identified in the literature four variables that directly impact innovation and internationalization of the firm: Technological Capabilities, Technology Investment, Alliances and Decision Structure. These variables are significant resources and capabilities that firms must develop to succeed. We explain these variables in turn in the next sections.

Innovation, Internationalization and Technological Capabilities

One common approach to firm internationalization and innovation is through technological capabilities. Technological capabilities are seen as accumulated technological knowledge (Kylaheiko et al., 2011). This knowledge is used to develop new product or services to enter new markets. This knowledge also contributes to path-dependent technology and firm innovation potential (Cohen and Levintal, 1990).

Internationalization is a method to expose the firm to knowledge and technologies of foreign markets (Kylaheiko et al., 2011), thereby providing opportunities for developing new skills and capabilities, and contributing to path-dependent technology and innovation. Understanding this, it is said that technological capabilities impact directly on the firm innovation system through internationalization.

Innovation helps translate tangible and intangible resources into innovative product or services (Sigh, 2013). This in turn leads to a sustainable competitive advantage. We propose that technological capabilities makes it easier to internationalize the firm. We argue that technological capabilities directly impact internationalization through innovation.

Innovation, Internationalization and Technology Investment

Dabic et al. (2012) propose that firm investment is a key variable (Dabic et al., 2012). Investment allows the firm to acquire and develop new technology or technological resources. This also allows the firm to develop new products or services. Technology investment becomes a factor for firm internationalization, given that firms are capable of developing new product or services (Jiang, Yang, Li and Wang, 2011; Grandstrand, 1998) for entry into new markets.

Technology investment also becomes a factor for innovation. Firms can acquire or develop technology which represent tangible and intangible resources (Fong and Ocampo, 2010; Villalonga, 2004; Lev, 2001), and contributes to path-dependent technology and innovation. This represents a double effect of technology investment, impacting directly on internationalization and innovation.

Innovation, Internationalization and Alliances

Resource Dependence Theory (RDT) has roots in RBV and is receiving added attention. This theory explains the association between firms and institutions and firms and other firms (Dress and Heugens, 2013). It also explains the establishing of alliances through the requirement of resources and capabilities. This implies, that firms are acquiring, imitating or getting access to strategic resources that are important for the firm. But they do not change the value proposition of the firm because of the erosion of resources value, or because both firms are in different stages of their development (Fong and Alarcón, 2010).

The firm, through the establishment of alliances, can access new resources that are important for internationalization (Sigh and Gaur, 2013; Peng, 2001). Some examples are market power or distribution chains, because alliances can perform as associations for selling product or services in other countries. Establishing alliances also performs as an agent of innovation, since the firm is accessing new resources and configuring the strategy of innovation with new technologies acquired (Grandstrand, 1998; Cohen and Levintal, 1990). Thus, establishing alliances is a key factor for both innovation and internationalization.

Innovation, Internationalization and Firm Decision Structure

Strategic decisions have long-term consequences for firm success or survival (Sigh and Gaur, 2013). A fundamental issue in strategic management is the decision making of managers. There are several important factors of the decision structure impacting this decision making. One factor is family ownership, since family ownership reduces the agency conflict between owners and managers (Casillas, Moreno and Acedo, 2012; Carney, 2005; Zahra, 2003). Decision making by the family allows firms to make easier decisions of internationalization or to get more involved in innovation.

Other related variables affecting decision making is firm flexibility, allowing workers to decide on procedures, and the plans for developing employees and acquire or develop new intangible knowledge (Grant, 1998). If the firm develops their employees and lets them make their own decisions performance will increase. This performance increase allows the firm access new markets and to more prepared people to make innovations (Cohen and Levintal, 1990). In this fashion, the more flexible the decision structure, the more opportunities the firm will have to enter new foreign markets and make more innovations.

Finally, authors have noted the more prepared the director is (Sigh and Gaur, 2013), the more effective decision they will take. This decision will lead to enter, or not, new foreign markets, or will lead the firm to innovate or not. Given arguments about firm decision structure, we propose the firm decision structure affects directly on internationalization and innovation.

Hypothesis and Research Settings

Given the theoretical background, we propose that firm internationalization and innovation are configured in a single strategy to reach success. This implies that internationalization and innovation of the firm create a single effort to succeed in foreign markets and innovation activities. This effort is seen through technological capabilities, technology investment, alliances and the structure of the decision making. This relation is described in the Figure 1:

Figure 1: Set of Hypothesis and Model Frame

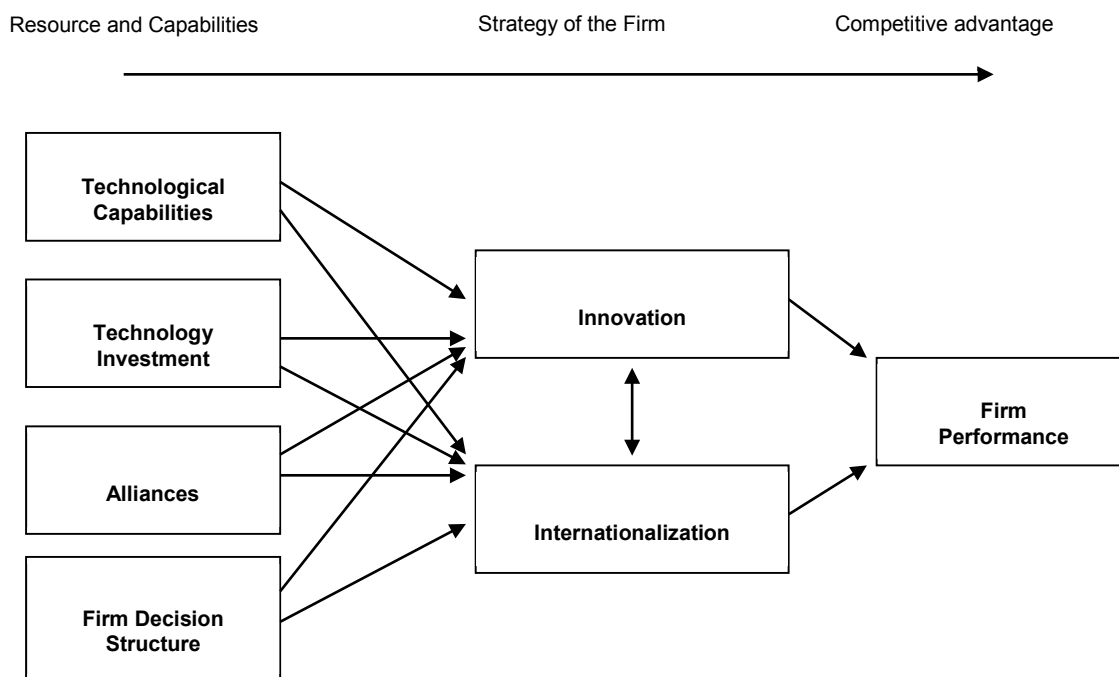


Figure 1: shows the key resources are Technological capabilities, Technology investment, Alliances and Structure of decision making. These resources impact both strategies of Innovation and Internationalization of the firm. By interacting with each other they become a single strategy to explain firm performance.

From Figure 1, we are going to test the hypothesis:

H0: Firm innovation strategy is the same as internationalization strategy

In other words the innovation and internationalization strategies of the firm are a single strategy. Innovation implies looking for new markets or accessing new markets, and internationalization implies innovation to obtain a competitive advantage in new markets. Innovation and internationalization are also determined by the same factors. This background supports the main hypothesis. Thus the same factors imply the next hypotheses:

H1a: Technological capabilities determine the innovation strategy of the firm.

H1b: Technological capabilities determine the internationalization strategy of the firm.

H2a: Technology investment determines the innovation strategy of the firm.

H2b: Technology investment determines the internationalization strategy of the firm.

H3a: Alliances determine the innovation strategy of the firm.

H3b: Alliances determine the internationalization strategy of the firm.

H4a: Decision structure determines the innovation strategy of the firm.

H4b: Decision structure determines the internationalization strategy of the firm.

According to Figure 1, the last two hypotheses are not tested because there are several studies that have examined this relationship between innovation and firm performance (Schwens and Kabst, 2011; Fong and Alarcón, 2010; Liang, You and Liu, 2010; Wu and Wang, 2007; Colombo and Grilli, 2005; Grandstrand, 1998; Autio and Yli-Renko, 1998) and internationalization and firm performance (Jiang, Yang, Li and Wang, 2011; Fong and Ocampo, 2010; Schmidt and Cavusgil, 2006; Calantone, Kim, Knudsen and Koed, 2002; Peng, 2001). Instead, we show descriptive statistic on the relationship between internationalization and firm performance and the relationship between innovation and firm performance.

DATA AND METHODOLOGY

Since firm innovation and internationalization seems to be the same strategy, in econometric language, it is said the relationship between them is not determined. The only way to know the causal relationship between them is to identify a variable that could determine a strategy, and then estimate the equilibrium relationship between them. Because this is not the case, the method proposed here is to see if a relationship between them exists is through correlation analysis with some proxy variables for innovation, internationalization and firm performance. We express a regression analysis for capturing the relationship described in the theoretical background.

The data source to test this hypothesis and for making the correlation and regression analysis, is a survey applied by the International Studies Department in collaboration with the Quantitative Methods Department of the University of Guadalajara in coordination with the Jalisco State Science and Technology Consul, in the city of Guadalajara in Mexico. The survey was conducted from February to July of 2010. This survey was applied to 57 firms in the metropolitan area of Guadalajara and was applied by bachelor students from the quantitative methods area. One observation has some lack of information. Thus this observation is deleted from the sample. The final sample includes 56 observations.

We estimate two regression models. One model is for capturing the effect of technological capabilities, technology investment, alliances and structure of decision taking on firm internationalization. The other is for testing the effect of the same variables on firm innovation. The two regressions are described in the next equations.

$$\frac{Export}{Sales} = \beta_0 + \beta_1(Innovation) + \beta_2(Technological) + \beta_3(TechInv) + \beta_4(Alliances) + \beta_5(Decision) + \beta_6(Control) + \varepsilon_i \quad (1)$$

$$InnoTotal = \beta_0 + \beta_1(Internationalization) + \beta_2(Technological) + \beta_3(TechInv) + \beta_4(Alliances) + \beta_5(Decision) + \beta_6(Control) + \varepsilon_i \quad (2)$$

The term Innovation refers to the vector of innovation proxy variables. Technological refers to the technological capabilities proxy variables. Decision refers to the vector of decision structure proxy variables. ε refers the error term. The equations have the same set of independent variables, except for the

innovation and internationalization proxy variables. The aim of these equations is to show there exists correlation between the two dependent variables. Also, it is the only way to show the relation between them because there is a lack of one single dependent variable to identify at least one of the two models. The variables used in this work for correlation and regression analysis are described in Table 1.

Table 1: Description of Variables for the Study

Variable	Description	Scale of mesure
Internationalization Proxy Variables		
Expor/Ventas	The ratio of export sales divided by the total sales	From 0 to 1
Inter	Level of internationalization	1: exports; 2:distributes products in foreign countries; 3: external filial; 4:establishment in other countries; 5:international corporate
Expor	If the firm exports or not	0: no and 1: yes
ExternalCap	External capital	From 0 to 1
Internationalization Proxy Variables		
InnoTotal	Total number of innovations	Real numbers
InnoProPro	Proactive innovation in products	0: no and 1: yes
InnoServPro	Proactive innovation in services	0: no and 1: yes
InnoProChg	Speed of reacting to changes in market products	1: minimum; 2: medium inferior; 3: medium; 4: medium superior; 5: maximum
InnoServChg	Speed of reacting to changes in market services	1: minimum; 2: medium inferior; 3: medium; 4: medium superior; 5: maximum
Technological Capabilities Proxy Variables		
RDDepart	R&D Department	0: dont have; 1: have
RDSpend	R&D Expenditures of the total sales	From 0 to 1
RD Agree	R&D Agreements	Number of R&D agreements
Technology Investment proxy variable		
TechInv	Technology Investment of the total sales	From 0 to 1
Alliances Proxy Variable		
Alliances	Number of alliances	Number of alliances
Decision Taking Proxy Variables		
Family	Family ownership	0: no and 1: yes
WorkAut	Autonomus Worker decision taking	0: no and 1: yes
IndDev	Formal development plan for the workers	0: no and 1: yes
DirEsc	Degree of education of the director	1: no university; 2: bachelor; 3: especialization; 4: master or PHD
Control Variables		
Sector	Manufacturing sector	0: no and 1: yes
Age	Age of the firm	In months
Size	Number of employees	Number of employees
Performance Proxy Variables		
SalesPer	Percentage of change in sales agaist past year	From 0 to 1
ProfitPer	Percentage of change in profit agaist past year	From 0 to 1

The first column shows the variable name. The second column shows the description of the variable and third column shows the scale measure of the variable.

The first equation uses the dependent variable, ratio Export/Sales, because it is the most common variable for explaining firm internationalization (Fong and Ocampo, 2010). The only problem with this variable is that it is a corner solution in mathematical language. Because firms have the choice to export or not to export. This problem leads to a double distribution probability in the variable. The solution proposed for estimating this equation is a Tobit model, since it considers this information, and is a more confidential method for this estimation.

In the second equation we use InnoTotal as the dependent variable because it is the most common variable for explaining firm innovation (Sigh and Gaur, 2013; Chen, 2012). The method for this regression is least squares, since it is a normal variable. For both equations heteroskedasticity was corrected by the White method of Standard Errors.

RESULTS AND DISCUSSION

In this section results are shown for the correlation and regression analysis. The research settings are contrasted against both sets of results. Then, results are discussed from the literature review expected outputs. First we show results for the correlation analysis between performance proxy variables and innovation and internationalization proxy variables, these results can be seen in Table 2.

Table 2: Correlation Analysis

	ProfitPer	SalesPer
InnoTotal	-0.005	0.032
InnoServPro	0.173*	0.038
InnoServChg	0.102	0.031
InnoProPro	0.068	0.075
InnoProChg	0.080	0.151*
Expor	-0.088	0.053
Export/Sales	0.116	0.212*
Inter	0.295*	0.091
ExternalCap	0.220*	0.267*

*The table shows there exists a linear relationship between innovation and internationalization proxy variables and performance proxy variables. The significance levels are as the next * 10%, ** 5% and *** 1%.*

Table 2 shows the existence of a positive linear relationship between innovation and internationalization proxy variables and performance proxy variables. These relationships are stronger considering firm profits rather than sales. There is only one negative correlation. This is the relationship between the decision whether to export or not and profits. This may be because the first variable is binary and the second is a continuous variable. It is common to find some nonlinear relationship in these kinds of analysis (Lehmann and Casella, 1998). The relationship between InnoTotal and profits produces a negative coefficient, but it is close to zero meaning there isn't a relationship between these proxy variables.

All significant correlations are positive implying a linear relationship between the variables. The most significant relationships in innovation on performance, are InnoServPro and InnoProPro. This implies proactive innovation increases firm performance. With regard to internationalization and performance, the most significant variables are Inter, Expor/Sales and ExternalCap.

So correlation analysis shows a positive relationship between Innovation and Internationalization and firm performance, and there is no need to make additional analysis for testing this relationship in this study. On the other hand, Table 3 shows the results of both regression analysis to test the relationship between Innovation and performance. For both regressions the almost perfect collinear variables were drop from the analysis.

Table 3 shows the regression analysis. Both are globally significant by considering the F-statistic (0.45 and 2.69 for first and second model) and the Adjusted R-squared of 0.33 for both. The two models can't be directly comparable, since in the internationalization model used a Tobit regression analysis which in turn is a nonlinear regression. The second model uses a multiple linear model. This means we can only compare the signs of the coefficients and the significance level. The discussions of the results follow.

Table 3: Results of Regression Analysis

Equation 1: Model of Internationalization			Equation 2: Model of Innovation		
Variable	Coefficient	Std. Error	Variable	Coefficient	Std. Error
Proxy Variables for Innovation			Proxy Variables for Internationalization		
InnoTotal	0.001*	0.000	Export/Ventas	7.310	11.200
InnoProChg	-0.070***	0.030	Inter	-9.350**	4.040
InnoProPro	0.300***	0.100	ExternalCap	42.260*	21.030
InnoServPro	-0.350***	0.080			
Proxy Variables for Technology Investment			Proxy Variables for Technology Investment		
TechInv	-0.580***	0.230	TechInv	-41.540*	20.920
Proxy Variables for Technological Capabilities			Proxy Variables for Technological Capabilities		
RDAGree	-0.050	0.200	RDAGree	67.700**	31.330
RDSpend	0.010	0.020	RDSpend	6.940**	3.050
RDDepart	-0.780**	0.330	RDDepart	52.140	46.130
Proxy Variables for Alliances			Proxy Variables for Alliances		
Alliances	0.010	0.010	Alliances	0.960	1.08
Proxy Variables for Structure of Decision Making			Proxy Variables for Structure of Decision Making		
Family	0.180**	0.070	Family	1.800	6.470
IndDev	0.080	0.070	IndDev	-16.700*	8.660
DirEsc	0.020	0.040	DirEsc	10.240**	4.800
WorkAut	0.160**	0.060	WorkAut	-16.550**	6.660
Control Variables and Intercept			Control Variables and Intercept		
Intercept	0.650***	0.250	Intercept	-34.810	30.380
Size	0.001	0.001	Size	0.030	0.030
Age	0.001	0.010	Age	-0.010	0.040
Age-squared	0.001	0.001	Age-squared	0.001	0.001
Sector	0.210***	0.070	Sector	1.610	6.270
Total Obs	56		Total Obs	56	
R-squared	0.55		R-squared	0.53	
Adjusted R-squared	0.33		Adjusted R-squared	0.33	
S.E. of regression	0.24		S.E. of regression	18.83	
Sum squared resid	2.20		Sum squared resid	13,468.30	
Log likelihood	-7.91		Log likelihood	-229.31	
F-statistic	0.45**		F-statistic	2.69***	

Both regression models are shown with the same independent variables. Innovation explains the internationalization, but also innovation explains internationalization. Both models have an acceptable level of confidence (F-statistic) and because of this all variables are included in both regression models. Also, the R-squared is high in both regression, adjusting the forecast to the true values. The only difference in the two models is that the first model is a Tobit Censored regression and the second is a Multiple Linear Regression. The significance levels are as the next * 10%, ** 5% and *** 1%.

The Relation between Innovation and Internationalization

The results of the first model are significant, since the innovation proxy variables significantly explain the Export/Sales proxy variable for internationalization. The meaning of the coefficient signs is as follows, InnoTotal and InnoProPro are as we expected, since total innovations and proactive in product innovation are important for firm internationalization. On the other hand proactive in innovating services and innovating in services just for the adaptation to the market changes are not important factors for internationalization. The result of these last two variables are consistent to those of Catalone *et al.* (2006).

The second model results are also as expected. The first proxy variable Export/sales has the expected sign as well as the ExternalCap variable. Level of internationalization measured by the variable “Inter” does not explain firm innovation. This means the most important incentives to innovate are the ratio of Exports/Sales and the external capital in the firm, but not if the firm is operating the production outside the country.

The results show a strong relation between firm Internationalization and Innovation. Finding new markets or establishing part of the production in other countries requires the firm to innovate. On the other hand, firms establishing production in other markets or selling part of the production in other markets, leads to new knowledge which in part leads the firm to innovate.

Technology Investment, Innovation and Internationalization

The results of technology investment is with a different magnitude than expected. It has a negative sign for both regressions. In other studies like Coeurderoy and Murray (2008) results show in a logistic regression a negative relationship in the occasional technology investment. Results show internationalization of the German firms, and a similar result with respect to innovation and technology investment in Monreal, Aragon and Sánchez (2012); Dabic et al. (2012) and Roper and Love (2002). It can be supposed the existence of idiosyncratic error in the estimation, because some other studies (Monreal et al, 2012; Dabic et al, 2012; Coeurderoy and Murray, 2008; Roper and Love, 2002) show there exist a negative relationship between these variables. But, this is still an assumption. In these kind of studies there exist a lagged variable with respect to time explaining this relationship. This implies rejection of the H2a and H2b hypothesis of a positive relationship between technology investment and innovation and internationalization.

Technological Capabilities, Innovation and Internationalization

For both regression models there exists a positive relationship between R&D expenditures and innovation and internationalization. This means this is the best proxy variable for measuring this relationship rather than a R&D department and R&D agreements. From this, we do not rejected the H1a and H1b hypothesis, which means that innovation and internationalization depends on R&D expenditures.

Alliances, Innovation and Internationalization

The magnitude and sign of the alliances coefficient for both models are as expected. Technically the only discussion is the significance level since for both models this coefficient is not individually significant. But, considering the F-statistic and R-squared, the inclusion of this variable in the model is justified, not rejecting the H3a and H3b hypothesis. This finding means that strategic alliances are important to access new markets or for accessing new knowledge to innovate.

Firm Decision Structure, Innovation and Internationalization

For the first regression all proxy variables of decision making structure have the expected sign and some of them are statistically significant. For the second model only Family and DirEsc has the expected sign. This in turn means they are proxy variables that better explain the relationship between firm innovation and decision structure. The coefficient of IndDev and WorkAut are not as expected but they are statistically significant, which is consistent with other works (Monreal et al., 2012; Kafouros et al., 2008). With this result we can't reject the H4a and H4b hypotheses. This finding implies that decision structure has a positive relationship with internationalization, and sometimes it has a positive relationship with innovation.

CONCLUDING COMMENTS

We propose that innovation and internationalization strategies are a single strategy of the firm. Both factors determine firm performance and the same factors (technological capabilities, technology investment, alliances and the decision structure) settle these strategies. The combination lead us to test the theory.

We use correlation analysis to test the relation between strategies and firm performance. The results show a positive relationship, implying the first argument is not rejected since innovation and internationalization

impact positively on firm performance. Second, we propose two regression analysis. In these models we tested the influence that technological capabilities, technology investment, alliances and the firm decision structure have on the both strategies (innovation and internationalization). We find this results in a positive relation (except for the technology investment). This means the same kind of factors determine both strategies in the same direction. This confirms the main hypothesis of innovation and internationalization as a single strategy of the firm, which in time unifies these theories in a single strategy.

Overall the reader must consider there is a relationship between innovation and internationalization. This relationship can't be expressed one-way in terms of a causal relationship. The variables are interacting. In fact, it can be said there is only a single strategy of the firm. This strategy is based on the same factors that involve internationalization and innovation. The logical conclusion is that innovation activities lead to internationalization, and internationalization leads to innovation. The same factors build a single strategy for innovation and internationalization within the firm (as shown with the regression analysis), which in turn leads to better performance in terms of sales and profits (as shown with correlation analysis).

The main limitations of this research are related to the sample. In the survey, firms were selected only from the metropolitan zone. The results may be subject to change if future surveys take into account the rural areas. In rural areas firms have access to different resources and are restricted to different public policies. In addition, this survey was taken in a specific year (2010). Future research might attempt to capture changes over time in these activities of internationalization and innovation.

Future research should take into account the Born-Global and Uppsala models of internationalization, where intangible resources play an important role for internationalization and thus for innovation. In addition, future research should consider the context of Technology Based Firms (TBF) for innovation and the technology transfer that plays an important role for firm innovation and internationalization.

REFERENCES

- Autio, Erkki and Yli-Renko, Helena. 1998. "New, technology-based firms in small open economies –An analysis based on the Finnish experience", *Research Policy*, Vol.26, pp. 973-987.
- Barney, J. 1991. "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, Vol.17 No. 1, pp. 99-120.
- Calantone, R.; Kim, D.; Schmidt, J. and Cavusgil, S. 2006. "The influence of internal and external firm factors on international product adaptation strategy and export performance: A three-country comparison", *Journal of Business Research*, Vol. 59, pp. 176-185.
- Carney, 2005. "Corporate governance and competitive advantage in family-controlled firms", *Entrepreneurship Theory and Practice*, Vol. 29, pp. 249-265.
- Casillas, J.; Moreno, A. and Acedo, F. 2012. "Path dependence view of export behaviour: A relationship between static patterns and dynamic configurations", *International Business Research*, Vol. 21, pp. 465-479.
- Chadha, Alka. 2009. "Product Cycles, Innovation, and Exports: A Study of Indian Pharmaceuticals", *World Development*, Vol. 37, pp. 1478-1483.
- Chen, Wei-Chih. 2012. "Innovation and duration of exports", *Economic Letters*, Vol. 115, pp. 305-308.

Coeurderoy, Régis and Murray, Gordon. 2008. "Regulatory environments and the location decision: evidence from the early foreign market entries of new-technology-based firms", *Journal of International Business Studies*, Vol. 39, pp. 670-687.

Cohen, W. M., and Levinthal, D. A. (1990). "Absorptive capacity: A new perspective on learning and innovation", *Administrative Science Quarterly*, Vol. 35, pp. 128-152.

Colombo, Massimo and Grilli, Luca. 2005. "Founders' human capital and the growth of new technology-based firms: A competence-based view", *Research Policy*, Vol. 34, pp 795-816.

Dabic, M.; Daim, T.; Aralica, Z. and Bayraktaroglu, A. 2012. "Exploring relationships among internationalization, choice for research and development approach and technology source and resulting innovation intensity: Case of a transition country Croatia", *Journal of High Technology Management Research*, Vol. 23, pp. 15-25.

Drees, Johannes and Heugens, Pursey. 2013. "Synthesizing and Extending Resource Dependence Theory: A Meta-Analysis", *Journal of Management*, Vol. 39, pp. 1666-1698.

Fong, C. R. and Alarcón, M.A. 2010. "Funcionamiento de empresas de base tecnológica: obtención de recursos estratégicos en las juntas críticas", *Revista Internacional de Administración y Finanzas*, Vol. 3, pp. 39-54.

Fong, C.R. and Ocampo, F.L. 2010. "Intangible resources as determinant of accelerated internationalization", *Global Journal of Business Research*, Vol. 4, No. 4, 95-105.

Grant, M. F. 1998. "The resource-based Theory of Competitive Advantage: Implications for Strategy formulation," *California Management Review*, No. 33, pp. 114-135.

Granstrand, Ove. 1998. "Towards a theory of the technology-based firm", *Research Policy*, Vol. 27, pp. 465-489.

Jiang, C.; Yang, Q.; Li, S. and Wang, Y. 2011. "The moderating effect of foreign direct investment intensity on local firms' intangible resources investment and performance implications: A case from China", *Journal of International Management*, Vol. 17, pp. 291-302.

Kafourous, M.; Buckley, P.; Sharp, J. and Wang, C. 2008. "The role of internationalization in explaining innovation performance", *Technovation*, Vol. 28, pp. 63-74.

Kyläheiko, K.; Jantunen, A.; Puumalainen, K.; Saarenketo, S. and Tuppurä, A. 2011. "Innovation and internationalization as growth strategies: The role of technological capabilities and appropriability", *International Business Review*, Vol. 20, pp. 508-520.

Lehmann, E.L. and Casella, George. 1998. *Theory of point estimation*. Springer, Second Edition.

Monreal, J., Aragon, A., and Sánchez, G. 2012. "A longitudinal study of the relationship between export activity and innovation in the Spanish firm: The moderating role of productivity", *International Business Review*, Vol. 21, pp. 862-877.

Peng, M.W. 2001. "The resource-based view and international business", *Journal of Management*, Vol. 27, pp. 803-827.

Roper, Stephen and Love, James. 2002. "Innovation and export performance: evidence from the UK and German manufacturing plants", *Research Policy*, Vol. 31, pp. 1087-1102.

Schwens, Christian and Kabst, Ruediger. 2011. "Internationalization of young technology firms: A complementary perspective on antecedents of foreign market familiarity", *International Business Review*, Vol. 20, pp. 60-74.

Singh, Deeksha A. and Gaur, Ajai S. 2013. "Governance Structure, Innovation and Internationalization: Evidence From India", *Journal of International Management*, Vol. 19, pp. 300-309.

Teece, D., Pisano, G., & Shuen, A. 1997. "Dynamic capabilities and strategic management". *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-533.

Wakeline, Katharine. 1998. "Innovation and export behaviour at the firm level", *Research Policy*, Vol. 26, pp. 829-841.

Welch, L. S. & Luostarinen, R. 1988. "Internationalization: Evolution of a concept," *Journal of General Management*, Vol.14, 34-55.

Wooldridge, J.M. 2010. *Introducción a la Econometría un enfoque moderno*. Cengage Learning 4th Edition.

Wu, Lei-Yu and Wang, Chun-Ju. 2007. "Transforming resources to improve performance of technology-based firms: A Taiwanese Empirical Study", *Journal of Engineering and Technology Management*, Vol. 24, pp. 251-261.

Zahra, S.A., 2003. "International expansion of U.S. manufacturing family business: the effect of ownership and involvement", *Journal of Business Venturing*, Vol. 18, pp. 495-512.

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