

# **EFFECT OF INTERNATIONAL ENTREPRENEURIAL ORIENTATION ON THE TECHNOLOGICAL INNOVATION CAPABILITIES OF PRODUCTS OF EXPORTING SMEs**

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**Abstract**

The objective of the study is to analyze the effect of the International Entrepreneurial Orientation on Product Technological Innovation Capabilities. Through an empirical study and a sample of 116 exporting companies from Aguascalientes, Mexico, it was observed that SMEs that tended to participate and support new ideas and creative processes, that anticipated future market needs and acted proactively in consequently, through the search for new opportunities, and for that they assumed controlled risks by committing significant resources in uncertain international projects, they had greater Product Technological Innovation Capabilities. This result has to do with the adaptability that companies seeking to internationalize must-have, since, to successfully enter foreign markets, they must have innovation capabilities that allow them to create products based on the specific needs and characteristics of new markets.

**Key words:** Entrepreneurial Orientation, Capabilities, Innovation, Technology.

**1. INTRODUCTION**

The need for companies to adapt to the new economic, political and social realities produced by important changes (economic globalization, advances in the technological revolution, progressive appearance of the service sector, shortening of the life cycle of products, changes in tastes and customer needs, etc.) has made national governments emphasize their plans and programs to strengthen and foster the development of SMEs in highly globalized, hostile and dynamic environments.

It is for this reason that the study of the International Entrepreneurial Orientation understood as the propensity of companies to create value based on being proactive, taking risks and being innovative in international markets (McDougall and Oviatt, 2000), has been in force since last century in which organizations had to start competing not only with national companies but also with international companies that sometimes had more advanced technologies and more innovative products.

However, the current conditions for SMEs worldwide are complicated. According to the OECD (2020), the growth that was taking place at the beginning of 2020 was subdued but stable. Unfortunately, the pandemic generated by the COVID-19 outbreak has severely hit economic structures worldwide. According to said agency, the restrictions that have been established on the movement of people, goods and services, and the containment measures applied, such as the closure of factories, have strongly affected the industrial sector and will harm supply chains, raw materials, and global trade structures. Due to this situation, companies must maintain a strong international entrepreneurial orientation that allows them to face this world situation and achieve permanence and growth in organizations.

However, it is not only important that companies have an innovative, proactive and risky attitude, it is also essential that they have the necessary technological capabilities to offer adequate products to the correct market. At this point, the use of technology becomes a key element, since the companies that develop it first will be the ones that will start with the commercial activities of the most innovative products, followed by other companies that will progressively adapt it depending on their capacities (Estrada and Heijs, 2005).

Therefore, it is considered that innovation capabilities are a key factor for a company to be competitive (Akman and Yilmaz, 2008; Belderbos, Gilsing, and Suzuki, 2015; Saunila, 2020) nationally and internationally, and they depend to a great extent the level and type of resources and competencies it has, as well as the ability of management to integrate and manage them successfully (Lawson and Samson, 2001).

That is why the combination of these two variables is considered relevant for the success of exporting companies, empirical evidence has been found that links them, showing that an International Entrepreneurial Orientation is a precursor for companies to develop technological innovation capabilities of products (Noor and Aljanabi, 2016; Aljanabi, 2018; Asemokha, Musona, Torkkeli and Saarenketo, 2019).

The contribution of this research focuses on the fact that extensive empirical evidence has been found in the literature that shows that the International Entrepreneurial Orientation together with the Innovation Capabilities are strong predictors of performance (Omar, Aris, and Nazri, 2016; Ribau, Moreira and Raposo, 2017; Mohammad, Massie and Tumewu, 2019; Valdéz, Ramos and Borboa, 2019), however, there are not many studies that demonstrate the effect between one and the other, so this study contributes to the strategic literature by analyzing the direct effect between these variables.

## **2. LITERATURE REVIEW**

### **2.1 International Entrepreneurial Orientation**

The Entrepreneurial Orientation, whose generally accepted characterization was proposed by Miller (1983), is based on three key dimensions: the constant search for innovation, proactivity and the tendency to accept moderate risks. This orientation has been analyzed from the two most important theories of the strategic literature, the Resource-Based Theory (Barney, 1991) and the Theory of Dynamic Capabilities (Teece, Pisano and Shuen, 1997). The Resource-Based Theory maintains that resources that are Rare, Valuable, Inimitable and Original allow the company to maintain abnormal returns, that is, very high (Covin and Miller, 2014), and has established itself as the essential theoretical basis for the development and success of the Entrepreneurial Orientation (Alarcón, Parra and García, 2013); while the Theory of Dynamic Capabilities proposes that the most successful companies can continually renew their Resources and Capabilities while taking advantage of accumulated strengths.

A more recent emerging approach to Entrepreneurial Orientation is the International Entrepreneurial Orientation (IEO) that is part of International Entrepreneurship. The distinctiveness of International Entrepreneurship within entrepreneurship theory and research was first recognized in the late 1980s with the research of McDougall (1989) and the seminal paper by Oviat and McDougall (1994). International Entrepreneurship is the discovery, enactment, evaluation, and exploitation of opportunities, across national borders, to create future goods and services (Oviat and McDougall, 2005), and it is an issue increasingly addressed as they are increasing companies that consider it important to generate sales abroad.

The International Entrepreneurial Orientation, therefore, has been defined as a combination of innovative, proactive and risk-seeking behavior that crosses national borders and aims to create value in organizations (McDougall and Oviat, 2000).

However, carrying out the International Entrepreneurial Orientation requires resources, for example, innovation involves initial investments (Kreiser, Marino, Kuratko and Weaver, 2013), proactivity implies high costs of search, learning, and retaliation (Bell, 1995), and taking Risks requires greater slack for possible losses (Shrader, Oviatt, and McDougall, 2000), and sometimes, companies that take on all three positions may be affected by their international reach due to increased tensions in their resources (Dai, Maksimov, Anitra, and Fernhaber, 2014).

To date, the empirical research of the International Entrepreneurial Orientation has used to a large extent, scales that evaluate only the three elements: risk-taking, innovativeness, and proactivity, because, according to Covin and Miller (2014), there is a better fit of the model with three dimensions than with five. Therefore, for the present investigation, it is proposed to use only the three dimensions that are explained in more detail below.

### **2.1.1. Innovativeness**

Innovativeness refers to the propensity of the company to participate and support new ideas, novelty, experimentation and creative processes that can lead to new products, services, or technological processes (Rauch, Wiklund, Lumpkin, and Frese, 2009; Arzubia, Iturralde, and Maseda, 2012; Fernández-Mesa, Alegre, and Chiva, 2012; Flores, Ojeda, and Lee, 2016), for these products to be accepted in national and foreign markets.

For this reason, companies that intend to export products must have the predisposition to innovate in products, to adapt to the trends of the country they will enter (Dai, et al., 2014), especially using the Information Technologies (Montejano, López, Campos, and Pérez, 2017) since, in countries that differ significantly from the country of origin, a company may be required to modify its products to meet the specific needs of new markets (Louter, Ouwerkerk, and Bakker, 1991). For this reason, it is that innovation influences the ability of a company to internationalize (Steensma, Marino, Weaver, and Dickson, 2000) and, also, it is considered that it helps companies to facilitate adaptation to multiple foreign markets (Dai, et al., 2014).

### **2.1.2 Proactivity**

Proactivity is considered as the anticipation and action on future needs through the search for new opportunities that may involve new product developments, markets, etc. (Fernández-Méza et al., 2012), or improvements in them (Alarcón et al., 2013), and implies taking the initiative in the effort to shape the environment so that a competitive advantage can be achieved (Ripollés, Menguzzato, and Sánchez, 2007) since otherwise it would fall into a passive and reactive behavior (Martins, Uribe and Mesa, 2012).

Knight and Cavusgil (2004), affirm that to establish and maintain the presence of a company in multiple foreign markets, it is necessary to proactively identify opportunities in each market. Proactive companies are considered to frequently plan the allocation of a part of their managerial and financial resources to carry out internationalization efforts (Diamantopoulos, and Inglis, 1988). Similarly, proactive companies are also considered to be more sensitive to the needs of the external market and are prepared to exploit opportunities abroad that are tailored to their capabilities (Morris, Webb, and Franklin, 2011). However, to detect opportunities, be sensitive to market needs, and effectively allocate resources, companies must have prior knowledge of the market in terms of foreign suppliers, customers, and partners (Dai, et al., 2014).

### **2.1.3 Risk Taking**

This dimension of the International Entrepreneurial Orientation consists of carrying out bold actions such as venturing into the unknown, mass contracting and committing a large part of the resources to launch new products with a high degree of uncertainty (Arzubiaga et al., 2012), as well as having the predisposition to commit significant resources to opportunities that have reasonable possibilities of failure (Fernández-Mesa et al., 2012). Logically, the acceptance of risks in business decision-making is inevitable in innovative and proactive behaviors (Ripollés et al., 2007).

The risks that a company may incur when internationalizing are diverse in each country, such as the uncertainty regarding the mode of entry to be used (Shrader, et al., 2000) and the strength of foreigner competition they will face (Miller, and Friesen, 1984). However, companies must have a certain tolerance for risk to achieve international expansion (Pérez-Luño, Wiklund, and Cabrera, 2011).

### **2.2 Product Technological Innovation Capabilities**

The importance of innovation capabilities has been analyzed for several decades, when Drucker (1954), a pioneer in innovation issues, argued that companies must innovate to survive in constantly changing environments. Therefore, innovation capabilities are considered fundamental components to achieve optimal innovation results (Aljanabi, 2018).

The Foundation for Technological Innovation COTEC (2001) mentions that for an innovation to be considered technological, technology must be used as a means to introduce a change in the company. In this context, the technology can be created (in/by the company itself) or acquired from any public or private provider, national or foreign. Likewise, it is considered that the only essential agent for technological innovation to exist is the company since it is solely responsible for its use to introduce change (Perozo and Rixia, 2014).

The academic literature on technological innovation has different approaches. One of them is the Technological Innovation Capabilities, and these can be defined as the potential that a company has to create new and valuable products or knowledge (Zheng, Liu, and George, 2010), as well as the ability to adapt to unexpected technological changes to meet current and future needs (Ince, Imamoglu, and Turkcan, 2016). According to the Resource-Based Theory, a capacity refers to the implementation and reconfiguration of resources to improve productivity and achieve strategic objectives (Makadok, 2001). By the above, technology is an essential capacity for companies to innovate in products (Bruhn, Alcántara, and Calegário, 2016) and compete with companies within and outside their territory.

There are two main conceptualizations of innovation capabilities, product technology innovation capabilities and process technology innovation capabilities. This research focuses on the first one. López, Montejano, and Pontón (2015) consider that in the face of increased global competition, companies should actively dedicate themselves to designing new products that have characteristics such as high quality and low costs. In the international context, the technological innovation capabilities of products are considered to be effective in the performance of exports (Oura, Zilber, and Lopes, 2016), and give SMEs a competitive advantage over those that do not develop them.

### **2.3 Relationship of International Entrepreneurial Orientation and Technological Product Innovation Capabilities**

It is considered that when a company adopts an entrepreneurial orientation, it allows sharing the vision and the organizational objectives (Rauch, et al., 2009), this encourages the generation of new ideas and the identification of better solutions to the problems and needs observed through product improvement or innovation. This process forces companies to adjust their processes or routines to find the mechanisms to carry out these improvements or innovations (López-Salazar, Molina-Sánchez, and Gómez-Hernández, 2018). In this process, the technological innovation capabilities of products are developed. This vision is supported by Poudel, Carter, and Lonial (2012), who consider Entrepreneurial Orientation as an intangible asset that precedes the development of technological innovation capabilities, thanks to which orientation it is established how resources will be used to generate products of value.

Similarly, empirical evidence has been found that shows a positive relationship between International Entrepreneurial Orientation and Product Technological Innovation Capabilities (Acosta, Nabi, and Dornberger, 2012; Noor and Aljanabi, 2016; Aljanabi, 2018; López-Salazar, et al., 2018; Asemokha, et al., 2019). This means that companies that develop a propensity to carry out innovative, proactive activities and take risks for such actions will have greater possibilities of developing technological innovation capabilities of products.

An example of this relationship can be seen in Aljanabi's (2018) study of 432 Iraqi companies. The research results showed that International Entrepreneurial Orientation contributed to the development of innovation capabilities and, therefore, continued efforts to develop an adequate level of Entrepreneurial Orientation were considered to be the essence for the development of Technological Innovation Capabilities. Another study in a similar context to that of the research is the one carried out by López-Salazar, et al. (2018) to 54 Mexican companies. The results indicate that if companies want to improve their level of technological innovation capacity, they must establish a business philosophy focused on innovation, which leads to making decisions proactively and taking the risks that these actions generate.

Based on the literature review carried out, as well as on the empirical studies showing a positive relationship between the International Entrepreneurial Orientation and the Technological Innovation Capabilities of Products, the following research hypothesis is proposed:

H1: In SMEs, the greater the International Entrepreneurial Orientation, the greater the Product Technological Innovation Capabilities.

## **2. METHODOLOGY**

The population selected for the research is made up of exporting SMEs from the State of Aguascalientes (Mexico), which have had continuous export activities and have been in operation for at least one year. Through a personal interview in which a structured questionnaire was applied to owners, general managers or export managers, 116 valid questionnaires were obtained. The data was collected between August 2018 and June 2019.

Of the 116 companies in the sample, 42.2% were from the agro-industrial sector, 12.9% from the textile/footwear sector, 18.1% from the metal-mechanical sector, 9.5% from the furniture sector, 5.2% from the automotive sector 7.0%, 4.3% from the pharmaceutical sector and the another 7.8% included other activities. Likewise, of the total sample, 84.5% of the companies stated that they had made exports to North America. On the other hand, 73.3% of the companies surveyed were being directed by a man, while only 26.7% were directed by a woman.

To measure the variables involved in the relationships to be tested, 5-point Likert-type scales were used in all cases. Before applying the instrument, a pilot test was carried out to detect errors or difficulties in understanding the items included in the questionnaire, which did not present any failure that had to be corrected.

For the measurement of the variable International Entrepreneurial Orientation, the scale developed by Miller (1983), modified by Covin and Slevin (1989), and used by Covin and Miller (2014), with only three dimensions: Innovativeness, Proactivity, and Assumption of Risks, since they have been the dimensions most used in the measurement of International Entrepreneurial Orientation (Hernández-Perlines 2014; Covin and Miller, 2014; Nik and Nnabuike, 2017; Lin, Cao and Cottam, 2019) because it has been observed that the fit of the model is greater when it is modeled as a three-dimensional construction made up of Innovativeness, Proactivity and Risk Assumption (Kreiser, et al., 2002).

For the Technological Product Innovation Capabilities, it is proposed to use the Camisón and Villar-López (2014) scale. This scale was developed based on Tuominen and Hyvönen (2004), Menguc and Auh (2010) and Camisón and Villar-López (2010) and focuses on measuring the capabilities of a company to develop new or improved products through five reflective items, which consist of the ability to replace obsolete products, to expand the product range, to develop ecological products, to improve product design and to reduce the time to develop a new product until its launch.

### **3. ANALYSIS**

To contrast the hypotheses presented, the methodology of the structural equation models has been used, for which a Confirmatory Factor Analysis (CFA) was performed, using the robust maximum likelihood method in the EQS 6.1 software (Bentler, 2005; Brown, 2006; Byrne, 2006). In the adjustment of the data, two items were eliminated: OEP1 that corresponds to the Proactivity dimension of the International Entrepreneurial Orientation and IPC3, which corresponds to the Product Technological Innovation Capabilities. The model, after eliminating two items, (Table 1) provides an adequate fit of the data (NFI = 0.9; NNFI = 0.927; CFI = 0.946; RMSEA = 0.065; S-BX2 / GL = 1.47). Traditional fit indicators are within acceptable limits indicating that for NFI, NNFI and CFI values greater than .90 indicate adequate fit. Regarding RMSEA values, values between 0.05 and 0.08 indicate an adequate fit (Byrne, 2006; Hu and Bentler, 1999). And for S-BX2 / GL an acceptable adjustment is considered if this index is less than 3 (Schermelleh-Engel, Moosbrugger and Müller, 2003). The reliability of the measures was calculated based on the Cronbach's alpha coefficient, as well as the Bagozzi and Yi (1998) Composite Reliability Index (CRI) and Fornell and Larcker (1981) Average Variance Extracted (AVE). For the first, the values were greater than 0.70 recommended by Nunnally and Bernstein (1994), for the second, the values were greater than 0.6, and for the third, the values were greater than 0.5 as recommended by Bagozzi and Yi (1998) showing convergent validity.

In the same way, all the measurements of the factorial loads are above 0.6, as recommended by Bagozzi and Yi (1988), which shows that construction is valid.

**Table 1. Indicators of validity and internal consistency of the theoretical model.**

Variable	Indicator	Factorial Load	Robust value t	Cronbach's Alpha	CRI	AVE
Innovativeness	IEO1	0.866	9.508	0.819	0.819	0.604
	IEO2	0.697	7.307			
	IEO3	0.759	1.000			
Proactivity	OEP2	0.772	6.645	0.764	0.772	0.628
	OEP3	0.813	1.000			
Risk taking	OER1	0.679	8.419	0.846	0.854	0.665
	OER2	0.846	10.183			
	OER3	0.904	1.000			
Technological Innovation Capabilities	IPC1	0.639	1.000	0.766	0.766	0.5
	IPC2	0.667	4.693			
	IPC3	0.665	4.102			
	IPC4	0.712	4.522			
NFI=0.9; NNFI=0.927; CFI= 0.946; RMSEA= 0.065; S-BX2/GL= 1.47						

Source: Own elaboration based on the results of the investigation.

The analysis of the discriminant validity (Table 2) was performed through the test of the Extracted Variance Test in which the square root of the mean extracted variance of a particular construct was compared with its correlation with another construct (Fornell and Larcker, 1981), and in all cases, the extracted variance index was greater than the variances of each of the pairs of constructs.

**Table 2. Discriminant validity of the theoretical model.**

Variables	Innovativeness (INN)	Proactivity (PRO)	Risk Taking (RT)	Technological Innovation Capabilities (TIC)
Innovativeness (INN)	0.604			
Proactivity (PRO)	0.301	0.628		
Risk Taking (RT)	0.197	0.264	0.665	
Technological Innovation Capabilities (TIC)	0.047	0.030	0.047	0.5

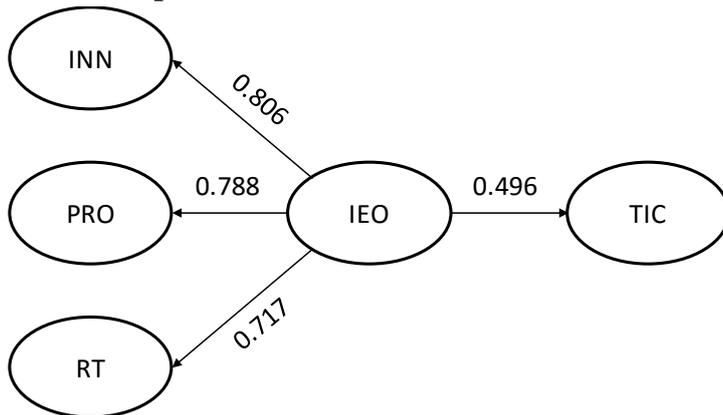
Source: Own elaboration based on the results of the investigation.

The results of the Confirmatory Factor Analysis show that the theoretical model evaluated has the necessary reliability and validity to test the research hypothesis.

**4. RESULTS**

The results of the contrast of the hypothesis are presented below. First, the results of the confirmatory factor analysis using EQS 6.1 software (Bentler, 2005; Brown, 2006; Byrne, 2006) and the robust maximum likelihood method, showed that the model fit was satisfactory (NFI = 0.9; NNFI = 0.927; CFI = 0.946; RMSEA = 0.065; S-BX2 / GL = 1.47), and that there is validity and reliability in the model (Graph 1).

**Graphic 1. Structural model analyzed. The values show the standardized coefficients of each relationship.**



INN= Innovativeness; PRO= Proactivity; RT= Risk Taking; IEO= International Entrepreneurial Orientation; TIC= Technological Innovation Capabilities. Source: Own elaboration based on the results of the investigation.

The result of the research hypothesis (International Entrepreneurial Orientation →Product Technological Innovation Capabilities) shows a standardized coefficient of 0.496 and a robust t value of 3.023, which shows (Table 3) that the higher the International Entrepreneurial Orientation of a company, the greater its Product Technological Innovation Capabilities, which allows confirming the hypothesis. This supports the idea that the propensity of companies to adapt their strategies according to the changing needs of the market through an innovative, proactive and risky stance, is the trigger for the development of product technological innovation capabilities that allow them to meet the specific tastes of domestic and foreign markets.

**Table 3. Results of the structural model.**

Hypothesis	Structural Relationship	Standardized Coefficient	Robust value of T
H1:In SMEs, the greater the International Entrepreneurial Orientation, the greater the Technological innovation Capabilities.	IEOTIC →	0.496***	3.023
NFI=0.9; NNFI=0.927; CFI= 0.946; RMSEA= 0.065; S-BX2/GL= 1.47			

Source: Own elaboration based on the results of the investigation.

## 5. CONCLUSIONS AND DISCUSSION

The importance of entrepreneurial orientation of companies as an important factor to achieve business success has been extensively addressed in the literature. However, in highly globalized, changing and hostile environments such as those facing SMEs today, it is essential that decision-makers act proactively, with innovative approaches and that they take the risks that this entails in a moderate and controlled manner, acquiring technological innovation capabilities, either in-house or jointly with other organizations, that allow them to compete successfully worldwide.

It is observed in the empirical evidence that a large number of companies have started to carry out international business activities at an early age and even when they are relatively small (Etchebarne, Geldres, and García, 2010), such actions carry greater risks. That is why managers must carry out correct strategies to develop technological innovation capabilities based on their particular business needs, in order to achieve successful products in the right markets, and without affecting their financial capabilities.

The hypothesis presented in this research mentions that the International Entrepreneurial Orientation has a positive effect on Product Technological Innovation Capabilities. The results obtained from a sample of 116 exporting SMEs from Aguascalientes, Mexico, allow us to accept the hypothesis. This research provides empirical evidence that supports the relationship proposed and supports the idea that the entrepreneurial approach carried out by the organization strongly determines innovative behavior in terms of developing technological capabilities for innovation.

The main limitation of the research was the sample size since it was carried out only in one state of Mexico. It is recommended to carry out the study with a larger sample to confirm the positive relationship between the study variables.

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