What prevents Portuguese SMEs from Innovating?

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Abstract

The importance of innovation on the survival and competitiveness of organizations is an undeniable fact. Small and Medium enterprises (SMEs) represent 99,99% of all Portuguese firms. This reality is shared by other European countries and therefore it is relevant to study their innovative behavior and attitudes in order to achieve competitiveness and sustainability. The present study inquires about barriers to innovation, namely, what are the barriers faced by domestic companies, which barriers are easier to recognize and overcome and what is the level of importance they have on the firm point of view. The course of the investigation consists primarily in undertaking literature review on topics such as innovation, barriers to innovation, SMEs, strategy and competitiveness. The theoretical support, resulting there from leads to the building line of work that is embodied in two surveys. The results achieved made possible the creation of two new models of classification and segmentation of the barriers. The BARINOV MODEL that evidences the existence of internal or external barriers and flashes upon the concept of deviation barrier. The BARIFASE MODEL embodies the innovation process through three phases and evidences the occurrence of the barriers to innovation during these stages.

Keywords: SMEs; Innovation; Barriers to innovation; Economic Sustainability; Portugal.

1 Introduction

The importance of innovation for the survival and competitiveness of organizations is an undeniable fact. The explosion of shared information, the growth of a more globalized economy and the rising crisis has changed the rules. Innovation is fundamental on the quest of profitable and sustainable growth. So organizations need to innovate to face the current downturn and survive.

New technologies, new products, new services, whole new industries have emerged. Since the Industrial Revolution, businesses rely upon technology as a driver of their progress. Innovation, understood as the sustainable implementation of improvements and new ideas, depends on other factors rather than this breakthrough technology, despite the fact that the technological improvements have provided consistently, in the past, opportunities from which were made and sold products and enhanced services (Dearing, 2000).

The economic environment is an ever-changing reality. Firms are forced to adapt rapidly, the speed and intensity of events make this concern a critical condition for the survival of businesses. The global markets and high-speed technological improvements have changed the competitive environment, making it more complex, more uncertain and forcing change in organizations.

Despite all this instability, economic crisis brings about opportunities as well as the need to adapt strategies and plan actions. Companies need to ensure they are able to compete with emerging countries, that their products and services fit the market needs.

Crisis forces to peep into short-run problems, the immediate future. All the same, firms cannot forget that today's decisions have impacts on the future. Also true is the existence of more space for small and medium enterprises (SMEs) with innovative spirit, to stand out. The deepening crisis since 2007 and the competition in the current world market, where emerging economies grow faster than the others, require European countries to puzzle out products and services of higher quality and more innovative.

Are companies prepared for this stage? What sustains the survival and sustainability of European SMEs, and especially the Portuguese ones?

Thus, the urgency and relevance for the companies, whatever the market in which they operate, to drive process improvements or changes involving their future sustainability is the current theme. The question that every business faces is in which way, using which tools and applying what attitudes and actions, will promote this claim.

Companies should endeavor processes towards sustainable innovation. This road is long and difficult once the available resources, mainly financial ones, are more and more scarce. This scarcity of resources swells the need to develop strong investment returns that contribute to cost structures cut and trigger market innovative products and services. Despite the development of this effort there is no guarantee that it is sufficient to achieve the competitiveness.

On this context remains to companies, almost exclusively, the pursuit of differentiation resulting from the practice of innovation (in any of its types), or more broadly, conducting proceedings of Research, Development and Innovation (RD&I). This broad need for innovation, supporting the diversification, that companies feel is also cause and effect of the reduction of product life cycles. Undoubtedly, companies must align innovation with its guideline and its strategic objectives.

According to the Organization for Economic Cooperation and Development (OECD, 2005), are considered innovation activities, all scientific, technological, organizational, financial and commercial activities, including investment in new knowledge, which is the implementation of innovations. These innovation activities have a unique and innovative base, or have as a result, significantly, the implementation of an innovation. The RD&I activities include the entire creative work, conducted in a systematic manner in order to extend knowledge, including knowledge of man, culture and society, as well as using this knowledge to devise new applications.

As sentenced by Porter (1998), the basic strategies conducive to the competitiveness of a company are based on cost leadership, differentiation or focusing. In the first case, the underlying logic is that producing cheaper products than the competitors, the company can offer its products to consumers in lower prices and increase their participation in the industry. However, the invasion of European economies with products from the East and South America reduced the possibility of winning by compressing costs and consequently practicing lower prices. Focusing consists in concentrating on a specific consumer. Finally, differentiation consists itself in offering a different product to customers, whether being unique in quality, design, in after-sales service, or any of its many features.

Overlooking at Portugal, the country never needed so much its firms to be able to compete externally. Enterprises know that the call for innovation is more intense than ever.

2 Literature review

The Portuguese entrepreneurial is mostly composed of small and medium-sized firms. SMEs are companies with fewer than two hundred and fifty employees, turnover of up to fifty million and balance sheet total less than forty-three million euros, under the Commission Recommendation 2003/361/EC on the 6th May two thousand and three.

According to the National Statistics Institute (INE, 2011), the number of non-financial corporations in Portugal at the end of the year two thousand and nine was one million and sixty thousand nine hundred and six. Only eight hundred eighty-eight of them employed more than two hundred and fifty workers (about 0.0837% of total). On the other hand, the number of companies that have less than ten employees reaches one million, fourteen thousand one hundred and three (95.59%). This data for the year two thousand and nine, reflecting the national trend, by itself justifies the importance of this national study on SMEs. Moreover, supports the usefulness of the results emerging from the sample.

According to Fernandes, Noronha and Nicolas (2002), the turbulence that characterizes the current socio-economic environment, driven largely by the imperatives of increasing innovation at various levels, maintains the most effective strategies of business as those that make the technology a privileged "weapon" for competitiveness.

Schumpeter (1939) portrays the importance of innovation for long-term profitability, considering innovation as a process of "creative destruction." To the author innovation creates competitive advantage by avoiding changes in the achievement of the balance, through the destruction of businesses and business models.

As Carayannis, Popescu, Sipp and Stewart (2006), SMEs are characterized by their ability to react quickly to changing market conditions, which represent a competitive advantage. In addition, SMEs are recognized by their growing participation in terms of employability and development of output. Notwithstanding that fact, SMEs suffer from lack of technology adoption as standard practice, despite their greater tendency for product innovation after applying technological innovation processes.

However, SMEs, according to previous authors, face critical economic challenges such as increasing competition driven by globalization, restrictions on access to finance, developed networks with foreign partners, imperfect access to the transfer of research results and technology, speed of change in the technological environment, and the uncertainty of sustainability.

For Tidd and Bessant (2009) organizations with more success in the market are leading innovation. Despite the competitive advantage could result from the size or ownership of assets, among others, there is favoritism, increasingly, to organizations that mobilize knowledge, technological skills and experience to the creation of novelty. This innovation is reflected in their offers and / or the way they create and integrate them in the product range. The theme of survival / growth raises the problem for established firms but provides a huge opportunity to rebuild the new rules of the game.

To Demirbas (2010) SMEs hold an important role in national economies because of their number and engaged workforce. However, despite recognizing its importance, some key barriers to innovation for SMEs prevent them to succeed in driving innovation processes.

Therefore the world faces extraordinary challenges. The effects of the crisis will have an impact in the coming years. In general, the measurement of welfare is based on the Gross Domestic Product (GDP) per capita, and changes in welfare can result from changes in labor productivity (GDP per hour worked) and labor utilization (hours worked per person employed). The erosion and deceleration of labor productivity growth performance is already a pre-crisis (2007-08), which makes it even more imperative for countries to find new and sustainable sources of growth.

Portugal is no exception to this. According to statistics from OECD Productivity (2009), between 2001 and 2007, GDP per capita grew, by about 0.3% annually between 2007 and 2008 and about (-) 0.3% per year. It could already be noticed, in labor productivity, from 2001 to 2007 the growing at an annual rate of 1.1%, while from 2007 to 2008 it grew by about (-) 1.4% per year. More even, the use of manpower, at an annual decrease of 1% between 2001 and 2007, and an increase of 1% from 2007 to 2008. This reading supports and corroborates the existence of resources accompanied by a low productivity promoted by their use.

Undoubtedly, innovation is a key required for improving productivity, growth and business sustainability. Given this environment, knowledge of the factors that lift innovation is the key. This study identifies and presents the barriers to innovation perceived and experienced by the Portuguese companies who participated.

According to Smith (2005), innovation is something new. It's creating something new through processes of learning or knowledge. Madrid-Guijarro et al. (2009) found that innovation is widely recognized as a key factor in the competitiveness of nations and companies. Small businesses that do not embrace innovation in its business strategy take the risk of becoming uncompetitive due to their obsolete products and processes. Innovative companies are a prerequisite for a dynamic and competitive economy. For these authors, the importance of innovation is mounting as a result of increased global competitiveness,

reduced product life cycle, increase of the technological capacity of companies and rapidly changing consumer requests. The study of innovation and innovative attitude of businesses is relevant in this context as a critical factor for the sustainability and survival of businesses. It becomes even more important noticing the facts that prevent companies, even after recognizing this need to be innovative.

To Pine (2002) organizations dealing with change, uncertainty, instability, competition in a systematic way should be alert to breaking barriers and stimulating actions that maximize the opportunities for the emergence of innovations.

According to Hadjimanolis (2003), there are factors or constraints that inhibit innovation: barriers to innovation. The study of the barriers to innovation focuses on the problems that can occur throughout the complex and delicate process of innovation. These factors, which place obstruction or inertia in innovation, termed barriers to innovation, can arise for various reasons. The identification and categorization is fundamental since it will create mechanisms to reduce its existence, minimizing them, deleting them or converting them into facilitators of innovation.

For most authors their categorizations divide into internal and external barriers (Hadjimanolis, 2003; Madrid-Guijarro *et al.,* 2009; Piatier, 1984; Stanislawsky & Olczak, 2010). Internal barriers are those that arise inside the company and external barriers, those that arise from the external environment. This classification is also assumed in the course of this study.

Piatier (1984) describes the lack of government support as an important barrier to innovation in the European countries analyzed. The study conducted for Accenture by the Economist Intelligence Unit (2007) over a population of six hundred and one senior managers revealed the following barriers to innovation: (1) the necessities related to the frequency, timing and speed of innovation, (2) the organizational culture mutation and reducing time to market as a permanent challenge in the assumption of innovation objectives and (3) the Chief Executive Officers (CEO) of full age have a greater departure from the view against the goals of innovation and innovative capacity of the organization. In addition to this, evidence, pointed out the following additional barriers to innovation reported in order of importance (higher to lowest importance within companies surveyed). Firstly, the organization seeks to follow the current line extensions rather than developing new business models. Next, the organization assigns top priority to short-term rather than long-term investments. Furthermore, opportunities to explore untapped markets or areas die for lack of those who foster. Additionally, the entity seeks for the next "chicken with golden eggs" rather than pursuing a portfolio of opportunities. And finally, the organization does not include in the learning process the past error modified due to a growing aversion to risk on new ideas.

According to Madrid-Guijarro et al. (2009), the barriers to innovation that Spanish SMEs face are essentially the external environment, the human resources, the risk and financial position. The same authors conclude that the cost of innovation affects more the small and medium-sized enterprises and that different barrier have different impacts on different types of innovation.

Segarra-Blasco, Garcia-Quevedo and Teruel-Carrizosa (2008) present barriers to innovation in Catalonia. The Barriers to innovation identified are divided between cost barriers, barriers of knowledge and market barriers. With regards to cost barriers are presented the high cost of innovation, and the lack of internal and external funds. The barriers of knowledge are the lack of qualified staff, the low information on technology, the poor information about markets and the difficulty in finding partners. Finally, market barriers cited are: the market dominance by the incumbent, the uncertainty of demand and lack of demand for innovation.

The UK companies face three main barriers to innovation, to be precise the time of development of innovation, the risk aversion and the poor market knowledge (Tovstiga & Birschall, 2007).

The German reality shows as being the more frequent barriers: the low budget, the difficulty in recruiting adequate human resources, the bureaucracy and poor cooperation between enterprises (Tiwari & Buse, 2007). Buse, Tiwari and Herstatt (2010) also emphasize the lack of the target market, bureaucratic constraints, and inability to find or decide for the better partner for strategic cooperation.

A study carried over SMEs in Cyprus showed the following conclusions: the internal most significant barriers are the lack of time, inadequacy of the activities of R & D, design and testing within the company, and also financial resources inadequate (Hadjimanolis, 1999). The author also identified the more expressive external barriers to innovation: the ease of copying the innovation, the government bureaucracy, lack of government support, lack of qualified human resources policies and bank lending.

In Brazil, Mussi and Spuldaro (2008) studied the following barriers to innovation: the risk associated with excessive specialization of human resources; super enhancement of production processes or services by its practitioners, the limitation in the allocation of financial end human resources and also the limitation on market access (for example concessions).

The observation of the Portuguese business community in order to understand the longevity of companies allowed to establish the following barriers to innovation: the high economic cost and risk associated with innovation, lack of funding, organizational rigidity, lack of skilled human resources, lack of market information and technology, government regulation and weak capacity to approach the client (Silva et al., 2007), as well as the lack of cooperation with centers of learning (Vieira, 2007).

Demirbas (2010) conducted a study on barriers to innovation in Turkey and reached some conclusions as follow. The entrepreneurs who are innovative are those with greater perception of barriers to innovation. The results show as barriers to innovation in Turkey: (1) the lack of state policies to support technology and R&D; (2) the negative impact of the economy in the level of investment, (3) the high cost of innovation, (4) the lack of appropriate means of financing and (5) the lack of qualified personnel.

Necadova and Scholleová (2011) identified as barriers to innovation in the Czech Republic the items described: (1) the high cost, (2) the lack of specialists, (3) the payback period of investment extremely long, (4) the equipment technology, (5) standards and legislation, (6) lack of capital, (7) the lack of consumer response, (8) resistance to change, (9) the fear of risk, (10) ignorance of the market and (11) the infrastructure of the business.

According to Comtesse, Hodgkinson and Krug (2002) the Swiss business sector faces the following barriers to innovation. The cultural level, are: (1) risk aversion, (2) public complacency, (3) non-recognition of high-value innovation, (4) the provincialism and (5), closed networks. In educational level are: (1) the inability of framework tools for innovation in education, (2) limited human capital, (3) the absence of functional models and (4) the lack of entrepreneurial mindset. At the political level: (1) poor access to financing, (2) legal barriers, (3) insufficient political vision and growth, (4) the infrastructure and intellectual capital and underutilized (5) too many restrictions on the innovation.

3 Goals

Due to the great contribution of the innovative activities to firm competitiveness and success, it is of great interest to identify the barriers and obstacles that prevent innovation in firms.

The objective of studying the barriers to innovation relates to the discovery of its nature, origin and significance. It is equally relevant to group them and try to understand their effects on innovation processes. Even more important is to identify ways to mitigate their negative effect, enabling organizations to overcome the negative impact resulting from its existence. Having identified the barriers or inhibitors of innovation, it may take measures that will lead to their elimination, favoring the flow of innovation in the circuit of companies.

The present investigation pretends to answer the following questions: (1) What barriers to innovation do Portuguese enterprises face?; (2) What is the relevance of each barriers attributed to the barriers identified by the firms?; (3) How are the barriers classified and grouped?

The current study reports the results of a study that examined barriers to innovation among a sample of thirty five Portuguese firms.

4 Methodology

According to Saunders, Lewis and Thornhill (2007) the pure investigation followed along this study ambers for the expansion of the knowledge about management and business processes, clears universal principles related to the latest and disclosure value for the society. As stated by Saunders *et al.* (2007) the investigation occurs along the following sequence: definition of the study topic, critical literature review, delineating the investigation, selecting the sample, data collection, data analysis and writing. This study followed this line of thought.

The present study started with a critical review of the literature approaching themes such as innovation, its classification, sources, dimension and barriers to innovation. According to Saunders *et al.* (2007) the methodology used is as described. The research philosophy is the epistemology and the research approach is inductive. The strategy consists on surveys. The time horizon is cross-sectional and the data collection methods are literature analysis, interviews, and questionnaires.

The data for this study was gathered from two questionnaires surveyed to a sample of thirty five enterprises.

The surveys were sent by mail to managers which answered the same way. In this questionnaire the firms were asked to present their perception about their own innovative attitude. The questions aimed at recognizing what prevents firms from innovating, if mainly internal or external factors. Subsequently the CEOs should point out what are the main refrains of innovation identified in the internal and external environment of the firm, in other words the innovation barriers faced. The studied firms were also asked to show what is easier to overcome if internal or external innovation barriers.

In the first questionnaire the main concern was not to influence the firms on their answers and letting them present their own convictions. The first group of questions intended to characterize the firms on dimension, geographic headquarters and activity. The dimension follows the European recommendation making it possible to compare the results with those obtained in others studies in other countries.

After collecting this data a second questionnaire was surveyed and the main goal was to determine if firms faced the barriers obtained in the first questionnaire and what level of importance, they recognized, as preventing innovation.

The sample is the same and the CEOs had to sentence if they felt the barrier and if so, what relevance (using a Likert scale) they recognize, so that the relevance of the barrier was known. Furthermore, firms were asked to declare where they felt these barriers. Lately, looking at the innovation process compounded by three phases (conception, implementation and feedback), declare in which of the phases are these obstacles more evident for the firm context. At last, compare the results to the ones obtained in the critical review of literature.

5 Results achieved

Lengthways the course of this investigation appeared interesting results on the topic of innovation. The surveys conducted counted with the participation of thirty-five companies. Four are large companies, four medium-sized enterprises, ten small companies and seventeen micro enterprises. The companies headquarters are located in the cities of Braga (five), Bragança (two), Lisbon (one), Oporto (twenty six) and Viana do Castelo (one) and develop a wide variety of activities such as farm activities, wholesale traders, retail traders, manufacturers and service providers.

When asked about their attitude towards innovation, 51,4% state holding it and 48,6% that they do not promote this innovative approach. Whether taking an innovative approach or not, companies have identified the most significant barriers to innovation faced. For 42,86% of those surveyed both the internal and the external barriers are significant, while 40% of the companies pointed as most important the internal barriers. Additionally, 80% of the companies said they were more successful in overcoming the

internal barriers, this means facing and dealing with the barriers to innovation that emanate from within the company.

Fifty barriers named by participants were listed. The same sample of companies was asked to designate those which are recognized as obstructing the process of innovation and afterwards to provide them a degree of importance in obstruction. For this purpose we used a Likert scale of six levels (reduced, little, some, enough, lot and huge).

The more alluded barriers were the current economic climate, the limitation of monetary resources, the reduced risk-taking culture, the mechanical performances, the routine and cemented processes, the organizational and human resources resistance to change, the lack of incentives and compensation for innovation, the high cost of new tools and processes and the small size of the company.

Heeding the importance attributed to the barriers showed that those with higher degrees of obstruction to the recognition of innovation do not match with the most universally cited by the companies. However, a common factor to most difficult barriers to overcome is that they arise from the external environment of companies. As a result, many companies can understand the difficulty in managing the barriers for the reason that they do not depend on the performance of the company.

With this work, further than attaining the knowledge of innovation barriers at the studied companies, it is possible to categorize them in an alternative way through BARIFASE and BARINOV MODELS now developed which display different views of the classifications existing so far. The BARINOV MODEL stresses the awareness or not of the barriers to innovation by firms. This model points out the capacity of firms to identify correctly the barriers they face. Some companies cannot recognize the existence of barriers to innovation. In this case the barriers are not perceived, independently of being internal or external. The other barriers are acknowledged by firms. Analyzing the answers of the participants is possible to perceive that some firms are mistaken about the origin of the barriers they face. Although recognizing the barriers (perceived barriers) and understanding well the split on internal and external barriers they advocate internal barriers has being born outside the company. By doing so, they downplay their existence, and do not set off mechanisms to avoid, minimize or eliminate them. On the other hand, some of the external barriers are considered to rise inside the organization. In this case, the effort carried out in order to treat, reduce or eliminate the barrier is of no value.

The usefulness of the model goes beyond the aforementioned characteristic and signs in the appearance of wrong-way (deviation) barriers. These represent a misreading of the source barrier. Therefore it may contribute to an effort to combat a barrier flagged as internal, but in genuineness external. In other words a totally pointless waste of resources. Or alternatively, the validation of a barrier to innovation as external, not being driven mechanisms of correction, when in reality, is internal and should be taken the decision on whether or not to fight it.

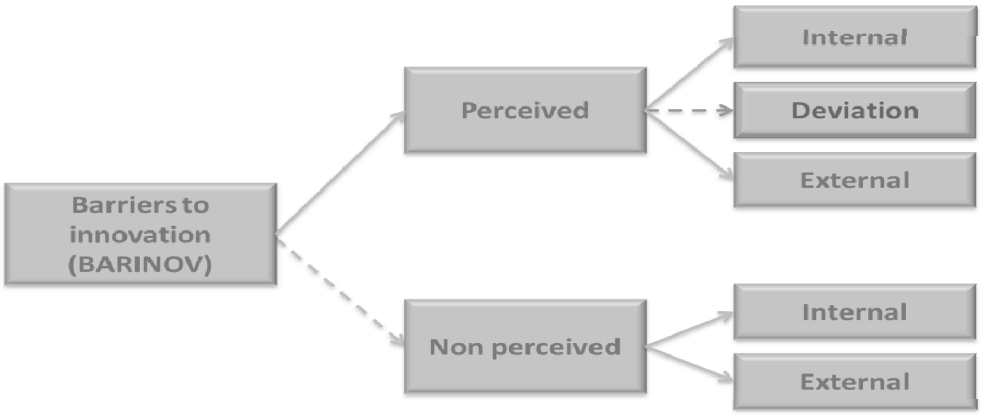

Figure 1: BARINOV MODEL.

Beyond the model portrayed before the answers collected allowed the appearance of another model: the BARIFASE MODEL that targets this topic on a dissimilar prism. It conceptualizes innovation in a three-phase process and evaluates the most important phases in terms of appearance and recognition of the barriers to the companies. These phases are labeled as: (1) perception, conception and ideation; (2) implementation and (3) feedback, control and performance. The first phase contemplates the creation of something that supports innovation, its embodiment. The second, named implementation exposes the diffusion of innovation through the organization and its frequent practice. At long last the third, consisting of monitoring and measurement, and if necessary or applicable, its correction or improvement.

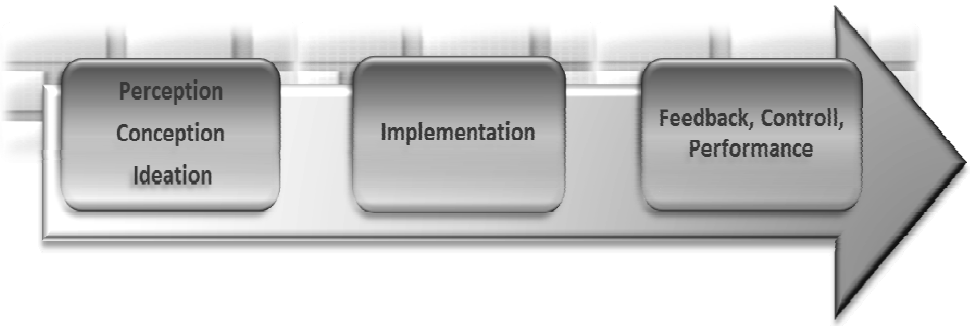

Figure 2: BARIFASE Model.

The usefulness of the BARIFASE consists of exposing the problem or retractor of the innovative process in different moments and allowing managers or decision makers to interpose in that specific moment and developing measures to promote innovation. This model evidences the possibility of taking care of innovation processes in the firm. If the problem arises along the first phase the company should promote the environment that promotes the birth of innovation. If, on the other side, the retraction of innovation occurs during the implementation, the company must emphasize the benefits and need of the implementation of innovation, not only in favor of the company but of all her stakeholders. Lastly, if the third phase does not develop correctly the firm cannot grow and add value through its own performance. Knowing the stronger moment enables the firm to improve by innovating.

The results obtained from the participants showed that they feel the most the inhibition of innovation along the phase of conception and creation. The phase most significant hereafter is the third phase - feefback and improvement.

6 Conclusions

The results brought by this study revealed the barriers to innovation faced by the participants, namely the current economic climate, the limitation of monetary resources, the reduced risk-taking culture, the mechanical performances, the routine and cemented processes, the organizational and human resources resistance to change, the lack of incentives and compensation for innovation, the high cost of new tools and processes and the small size of companies. It also allowed the acquaintance of barriers importance perceived by firms, and made it possible to understand that some factors born outside the firm are considered more difficult to overcome and the more important barriers that firms face.

Innovations reflect a critical way in which organizations react to the challenges they face. Knowing their perception of the innovation barriers is an undeniable advantage to promote their maintenance in the market. The results show that companies consider themselves not to be very innovative, that they essentially face internal and external barriers. And also that external barriers are more difficult than internal ones to overcome.

In addition the BARINOV MODEL stresses the perception or not of the existence of barriers, it also exposes the capacity of understanding internal and external barriers and brings about the concept of deviation barrier, which in the limit represents a total waste of resources by the firm.

When regarding the BARIFASE MODEL it enables companies to treat the phase of the innovation process that is weaker for that specific company, and lightens the more important and profitable measures to be carried out.

The conclusions reached by the study can help firms overcome problems along innovation process, give information for their CEOs to conduct innovation process in a different way, and help firms understand what is wrong in their innovation process. Mainly, what needs to be improved, where are they spending their resources sometimes without obtaining return, and what are the more frequent barriers they face. By doing so, they are free to spend their time and resources in other themes over the corporation. It also helps spreading innovation.

Despite all the work that has been developed, the authors will extend the study to further SMEs and enlarge the sample in order to obtain other valuable information and continue lightning the innovation path.

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