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Innovation in the portuguese health sector organizations: empirical evidence from the community innovation survey

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Abstract The main purpose of this study is to analyze the innovation on the Portuguese healthcare sector organizations.

In this study, we followed a quantitative approach, combining statistical and documental analysis, through the Community Innovation Survey (CIS) data analysis and processing, thus performing an exploratory, descriptive and transversal study.

The healthcare sector reveals dynamism in introducing products that are new to the market and the company, mainly through a closed innovation process. External cooperation is preferably R&D-oriented, and there is low involvement of market agents in R&D activities, through partnerships. However, these are seen as an important source of information and organizations seek to meet their needs. Different types of organizations adopt different innovation strategies, depending on their market and current situation, which translates into a contextual innovation policy, in line with the current theoretical developments.

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1. Introduction

The role of innovation in economic development has been raising questions regarding its effects on the competitiveness of organizations and nations themselves. The topic has been the subject of study by Schumpeter's economic devel-

opment theory within the capitalist model at the beginning of the industrial revolution. The author differentiates invention from innovation, arguing that an invention is an idea, sketch or model for a new or improved product, process or system and that an innovation in the economic sense is only complete when there is a commercial transaction involving an invention, thus generating wealth (Santos, Fazon & Meroe, 2011). Initially the application of innovation in organizations was characterized by a linear invention process in order to then sell the invention, where the main actors were basically the departments of research and develop-

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ment (R&D) and the market. Innovation didn't belong to the strategic's sphere of organizations, because they were practically non-existent (Gomes, Grandson & Giotto, 2007).

Innovation can occur throughout a process, a new product line, a new advertisement or new technological advances (Lumpkin & Dess, 1996). There are several ways to identify the degree of innovation of a company, as the volume of financial resources invested in innovation, human resources devoted to innovation activities, number of new products or services launched on the market or frequency of change in product or services lines (Covin & Slevin, 1989).

Drucker (1986) points out that entrepreneurship is risky because so few of the so-called entrepreneurs actually know what they are doing, and that they lack proper methodology. For this author, entrepreneurial activity should be systematic, requires management and most of all needs to be based upon intentional innovation. In this process, it is crucial to know how to recognize those needs and to identify the best response to them, considering all the relevant factors involved. These factors may reveal themselves as facilitators to the whole process or, instead, create impediments and block it. This is why innovation requires good management. How do all these factors come together? Both theoretically and in practice, current trends identify innovation, internationalization and the exploitation of synergies as fundamental parts of business strategy. This point of view is supported not only by the Organization for Economic Co-operation and Development (OECD, 2011), but also by COTEC Portugal (2010), supporting the new "open innovation" paradigm.

The R&D of innovative products and services related to life sciences is determinant in the healthcare sector. Within the scope of value-based competition, Porter and Teisberg (2006) claims that all innovation that actually generates real value to the customer is highly rewarded in a competitive market. This author sustains that although technological innovation in healthcare is often seen with distrust and its adoption blocked by financial constraints, it is a fundamental part in the development of health care.

The Portuguese national innovation system has been producing quite positive results, not only for economic agents in particular, but also for the economy in a global sense.

2. Theoretical framework

2.1. The Portuguese Healthcare Sector

The Portuguese health system consists of the National Health Service (SNS), health sub-systems and also private health systems. The SNS is mostly financed by the government budget, with co-payments representing only about 1%. According to our research, 17% of the population is covered by one of the sub-systems via employment benefits, whereas 21% is voluntarily covered by private health insurance (Keckley, Coughlin, Gupta, Bajanca & Moreira, 2011).

The several public bodies and public health services that set the system structure, integrate the State's direct and indirect administration (central services, institutes, the Regional Health Administration - ARS), as well as public sector companies, under the Health Ministry, which relies on the support of the National Advisory Body (CNS) and an

independent Health Regulatory Board (ERS) (Ministério da Saúde, 2011).

Private healthcare institutions, besides providing services to patients covered by private health insurance and to self-paying customers, establish contracts with the SNS to provide specific services, thus integrating the national covenanted providers' network.

The state takes on a substantial weight on the health sector in Portugal, which was, in 2012, responsible for 62.3% of its total expenditure. When the SNS was created, public expense in healthcare was about 2% of the GDP, whereas currently it is over 10% (BMI, 2013). The challenges it comes across with are increasingly large, considering many factors, namely the imbalance in the age structure of the Portuguese population. In the last decade, the population-aging trend has been more pronounced, with a reduction of individuals in all age groups up to age 29 and an increase of 26% in the age groups above 69 years old (INE, 2012).

Deyo (2002) argues that the demographic transition, characterized by an aging population, combined with a universe of better informed users, has resulted in a growing demand for new medical products and services. Naturally, this implies increased needs in health care provision, a responsibility that the state must ensure. In a context in which the scientific and technological evolution allows access to better care, the available means for their provision are becoming more expensive. Therefore, it is becoming particularly relevant to aim for the sustainability of the health system.

The effectiveness of a universal health policy implies rethinking the health care system globally, thus originating a management model based on the need to increase productivity and reduce public spending (Rêgo, 2006). This model, referred to as the "New Public Management", was introduced by Hood (1991), and based primarily on the adoption of business management principles and methodologies in the public sector and building on the experience of its implementation in the private sector. This view is supported by Araújo (2002) who argues that its adoption is the right way to achieve those objectives, namely the achievement of the health policy and its sustainability, and considers the management of the private sector more capable than the public administration for this purpose. The construction of this model is based, namely, on a greater discipline in the use of resources, the evaluation of results and performance measurement against the previously established objectives (Hood, 1995).

We can conclude that the current context requires a greater accuracy and efficiency in resource allocation in the health sector. Despite the negative perception that exists among the Portuguese, we can look with satisfaction at the results achieved in the recent decades and the quality of care that the country offers.

2.2. Innovation

Lumpkin and Dess (1996, 2001) state that innovation is reflected in the tendency for the company to engage in new ideas, novelty, experiences and creative processes that may result in new products, services or technological processes. They might as well as result in the willingness to support

creativity and experience in introducing new products or services, novelty, technological leadership and R&D in the development of new processes.

This entails the development of creative and unique solutions to address the threats the company faces (Knight, 1997) and the effort to find new opportunities and modern solutions (Dess & Lumpkin, 2005). To Voss, Voss and Moorman (2005) innovation must embrace a commitment to generate and create new ideas which result in new products. The process of generating new ideas will thus prevent the stagnation of the company, giving its products and services a competitive advantage, the “compass” that will set its direction and help to adopt a business strategy (Abrar, Tian & Deng, 2009). Frank, Kessler and Fink (2010) emphasize innovation as the strategic posture of a company, with regard to the willingness and ability of the company to question existing conditions and create room for creativity, new ideas and experiences.

Drucker (1986) points out the importance of knowing and identifying the sources of innovative opportunities as a means of implement a methodology which allows to take the most out of them, identifying seven sources of innovative opportunities to which organizations should pay attention: the occurrence of unexpected events whether they are successes, failures, or external events; incongruities within an industry, which are subjective and liable to be identified only by those who are deeply knowledgeable of its context; however, the resolution of these flaws is an opportunity for innovation; operational needs: in the context of a particular process, lies a “weak link” that triggers the change, originating the so-called “research program”; changes in industry or market structure; demographic changes; changes in the perception, attitude and meaning which are also quite subjective and require careful analysis, in order to find out whether we will respond to a real change in the market or just a fad; and new knowledge.

Innovation can rise as a consequence of the situations listed above, depending on how the organization reacts to each of them. Success is thereby achieved through the greater ability to react in the right way at the right time, hence the importance given to the role of management in seeking and exploiting these opportunities. This view is supported by the Innovation Agency (Agência de Inovação, 2011), which sees technology and innovation management (TIM) as an area of expertise, which combines disciplines from the fields of industrial engineering and management. This means that, either to the development of a new product, or to the selection of new equipment and design and production support systems, success depends essentially on how technology is managed. In practice, TIM includes a wide range of activities such as research and development management, including determining the economic viability of R&D projects, managing the development process of new products or services, management of the factors that influence the successful introduction of technological innovations in the market or business, and management of highly qualified human resources (Agência de Inovação, 2011).

Thus, regarding the creation of the necessary conditions to the sustainability of innovation, the emphasis is placed on the management level and on the processes associated with it. Its continuity therefore requires a rich individual profile, or alternatively, the delegation of responsibilities to those

who possess the necessary skills. This idea is in fact shared by Shapiro (2012), who gives the example of an organization that created a pyramidal innovation structure, including individuals from top management, to those within the most varied lines of business. Innovation activities should involve both those responsible for decision-making, and those who are in touch with the specific needs of each market.

OECD (2012) states that it is essential to study and understand the essence of innovation processes and their impacts on businesses and the economy, aiming to replicate these effects. In order to do so, it is essential to obtain reliable and systematized information.

Innovation helps companies to attain competitive advantages among other competitors, based on the use of new technologies or market knowledge, so as to offer new products or services to customers (Vaccaro, Jansen, Bosch & Volberda, 2012), as well as respond to the market’s needs, creating new products, developing existing ones and optimizing production by using latest technologies (Vaccaro et al., 2012; Ussmane, 2013).

A product can be considered new when its cost is low or its qualities are improved or non-existent on the market (Gomes et al., 2007). It can be understood as a process that aims to turn opportunities into new ideas and put them into practice (Tidd, Bessant & Pavitt, 2005). This process results from the combination of own scientific and technological knowledge that derives from the entrepreneur’s personal capabilities. This leads to the development and adoption or commercialization of new or improved products, processes, organizational or marketing methods (Dantas, 2013).

Monteiro, Soares and Rua (2013) related innovation to the development of creative and unique solutions to address the threats that the company faces. They consider it an important factor for entrepreneurship development, in the sense that the company can develop new ideas, experiences, new processes that can result in new products and services.

On the other hand, Vianna, Vianna, Adler, Luena and Russo (2013) argue that innovation consists in finding technological solutions in order to continuously improve products and processes and to explore new markets. Innovation can also be defined as the introduction of a new product or the improvement of its quality; insertion of new production methods in the company; changes in the implementation of a new product, service or internal process; and in a new business management strategy or the introduction of new ideas implemented with success (Kurako & Hodgestts, 2004; Tidd, Bessant & Pavitt, 2007; Chandra, Styles & Wilkinson, 2009).

3. Research Methodology

We consider the quantitative approach as the one that best suits the needs and specificity of the present study. This combined both statistical and documental analysis, in terms of treatment of the data collected through the instrument described below. Thus, through an exploratory, descriptive and cross-sectional case study, we intend to analyze the evolution of innovation in the Portuguese health sector organizations.

The instrument adopted for data collection was the Community Innovation Survey (CIS) evidencing a base of secondary data (GPEARI, 2010). The CIS is currently the main statistical tool in the study of innovation at European level, since it is a compulsory statistical operation, conducted periodically in all EU member states, and follows the methodological recommendations of Eurostat, Statistical Office of the European Union, as well as the principles of the Oslo Manual (OECD, 2005), which aims to provide a working framework whereby the existing studies can evolve towards comparability, and establish guidelines for the treatment and analysis of data relating to innovation.

The total number of companies surveyed in this statistical operation was 7,952, considering all the sections of the reference population. The responses from 6,593 companies have been validated, representing a response rate of 83% (GPEARI, 2010), which according to Menon, Bharadwaj, Adidam and Edison (1999) is considered very good.

Data was collected through an electronic online platform, developed especially for this purpose. 98% of the surveyed companies responded to the questionnaire by electronic submission, using "logins" and "keywords" previously assigned (GPEARI, 2010). The execution period occurred between May 21, 2009 and April 12, 2010, and the reference period to which data relates is comprised between 2006 and 2008.

The population of this study is the organizations of the health sector in Portugal. Based on the Portuguese Classification of Economic Activities (CAE) (INE, 2007), we selected the subclasses listed in the following table.

Table 1

The sample was stratified by size of business (considering the Employment Size Class - EPS), by 2-digit CAE (except for CAE 15, 16, 17, 18, 22, 237, 245, 25, 283, 289, 32, 33, 38, 46, 471, 494, 58, 63, which have been considered separately at 3 digits) and by regional distribution. The selection of these subclasses resulted in 152 records, and it materializes in our sample. We find that the group of healthcare facilities with inpatient service (CAE 86100) represents 39% of the sample, with 59 organizations considered. Drug manufacturing activities (CAE 21201) and manufacture of orthotic and prosthetic devices and medical-surgical instruments (CAE 32502) represent, respectively, 19% (29 registries) and 15% (23 registries). The remaining 27% of the sample are comprised by other activities.

4. Results

4.1. Characterization of the sector

The health sector organizations in Portugal are located predominantly in Lisbon (41%), in the North (28%) and Central Portugal (19%). Of all the organizations surveyed, 41% belongs to a group of companies, from which 78% has its headquarters in Portugal. The average turnover reported in 2008 was € 37,891,099.02, ranging between € 200,000 and € 383,153,400. The average number of employees in 2008 was 687, of which 45.1% had no college education, 52.9% had a diploma or bachelor degree and only 0.02% had higher levels of education.

4.2. Internationalization

Regarding the location of other companies of the group or the headquarters itself in foreign countries, internationalization is seen only in 13% of the total sample. As for the markets in which they operate, 59% only work for national and/or local market, of which 69% indicated local or regional market as the largest contributor to its total annual turnover. So we identify a sector rather driven to the local market of the regions in which it operates, with only 7% of the organizations indicating the external market as the majority of its annual turnover.

4.3. Product and process innovation

When analyzing the different types of innovation studied, there was a good performance by the surveyed organizations. Out of the total, 72% indicated they introduced innovations in at least one area (product or process).

With regard to the introduction of new or significantly improved goods and/or services, 60% of the organizations reported having done so, 66% of which were developed in-house and 22% in cooperation with other institutions. As for the goods or services introduced, 53% of the companies indicated they were new to the market and 47% were new for the company only. This data reveal the dynamism and potential for the internal development of innovations, as well as some openness to external partnerships. In addition, 64% of the organizations confirmed the implementation of at least one type of process innovation, which revealed to be an area more prone to external collaboration, reported by 42% of the companies in this group. In this field, the focus was held on innovating the activities that support business processes, carried out by 54% of the respondents. The introduction of new or significantly improved manufacture or production methods, or even logistics, delivery or distribution methods was only reported by 43% and 36%, respectively. It's also important to observe the impact that the introduction of new or significantly improved products has on their results. Data shows that, on average, 81% of the turnover of the 91 companies that have introduced product innovation comes from unchanged or marginally modified products. That is, innovative products represent, on average, merely 19% of its annual turnover in the period under review.

To characterize the least innovative activities we note that about a third of the organizations that have not introduced a product or a process innovation belong to the category of healthcare facilities with inpatient service (CAE 86100).

4.4. Partnerships

In this analysis, it is also important to define the cooperation profile of the organizations under study, to understand what kind of partnerships they establish. Data show that about 39% of the respondents (59 out of 152) declared having cooperated with other companies and institutions in the context of innovation activities.

Looking at the data, we can discern that the joint participation in innovation activities occurred primarily with partners in Portugal and in other European countries.

Table 1 Health sector activities in Portugal (CAE Rev. 3).

Section	Division	Sub-class	Denomination
C	21		Manufacturing Industries
			Manufacture of basic pharmaceutical products and pharmaceutical preparations
		21100	Manufacture of basic pharmaceutical products
		21201	Drug manufacturing activities
		21202	Manufacture of other pharmaceutical goods
	26		Manufacture of computer, communications equipment and electronic and optical products
		26600	Manufacture of irradiation, electromedical and electrotherapy equipment ¹
	32		Other manufacturing industries
		32501	Manufacture of ophthalmic optical equipment
32502		Manufacture of orthotic and prosthetic devices and medical-surgical instruments	
M	72		Consulting, scientific, technical and similar activities
			Scientific research and development activities
		72110	Research and development in biotechnology
Q	86		Human health and social care activities
			Human health activities
		86100	Healthcare facilities with inpatient service
		86210	General practice medical activities, in ambulatory
		86220	Specialized medical activities, in ambulatory
		86230	Dentist and orthodontist activities
		86901	Clinical laboratories
		86902	Ambulances ¹
		86903	Nursing activities ¹
		86904	Collection centers and organ banks
		86905	Thermal activities
		86906	Other human health activities, N.O.S.

¹ Not included in the study because there was no record of this activity on the data collected.

Source: Adapted from CAE Rev. 3, [INE \(2007\)](#).

Collaboration was more frequent with suppliers and consultants, laboratories or private R&D institutions, regardless of their location. Higher education institutions also have a great weight of in these partnerships. By analyzing the external cooperation in particular, we find that competitors or companies from the same sector also have a fairly significant role. When asked about the most important type of cooperation partner for their innovation activities, 32% of the respondents, who reported having cooperated with other companies and institutions, pointed out the suppliers. The collaboration with institutions of higher education (22%) and customers or consumers (15%) was also given some emphasis.

In the context of cooperation for innovation activities, the preferred sources of information, for the health sector organizations, are mainly internal. About 84% of the respondents assign average or high importance to internal sources of information, these having been mainly involved in the birth and in the conclusion of innovation projects. The importance of market sources (customers, consumers, suppliers, competitors and consultants) is relatively lower, highlighting consultants and private R&D institutions, with zero or low importance to 56.6% of the organizations. Institutional sources such as universities and government agencies with R&D activities also have low or zero

importance to 63.7% and 71.7% of the respondents, respectively. Other sources such as conferences, trade fairs, exhibits and publications have high or medium importance for more than 50% of the organizations, which reveals some isolation in the development of innovation projects.

4.5. Marketing and organizational innovation

As for organizational innovation, regarding the introduction of new methods or business practices related to internal or external organization, the numbers are in general similar to those observed for product and process innovation. Of the total surveyed, 59.2% reported having introduced some sort of organizational innovation. By comparing with the data observed for product and process innovation, we only find a significant difference in the manufacture of orthotic and prosthetic devices and medical-surgical instruments. Only 9 companies in this group have introduced organizational innovation, while 17 reported product and process innovations.

As to the objectives targeted for the introduction of such innovations, 81.1% gives a high importance to reducing the response time to customer or supplier needs and 84.4% of the organizations indicate the same level of

importance to improving the quality of products. Improving the ability to develop new products or processes has medium or high importance to 85.6% of the respondents and, to 92.2%, reducing costs per unit produced and improving internal and external communication also has medium or high importance. Hence we emphasize the relevance given to the client, in the implementation of organizational innovations.

In this context, marketing innovation recorded the lowest expression among the surveyed organizations, with only 49% reporting this type of innovation. Nevertheless, it is important to note some differences in the types of innovation introduced by the different groups studied. For healthcare facilities with inpatient service, it should be mentioned that about 81% of the organizations reported having introduced new techniques or means of communication for the promotion of goods or services, which is the most common marketing innovation in this group. Changes in product aesthetics or packaging were also relevant (reported by about 70%). However, this type of innovation was more frequent for the manufacture of orthotic and prosthetic devices and medical-surgical instruments and also for drug manufacturing activities.

It should be also noted that the introduction of new pricing policies, despite having some expression in other groups (between 33% and 40%), was made by only 7% of the drug manufacturing companies. The main goals for this type of innovation involve increasing or maintaining the market share and introducing products in new customer groups (average or high importance to 89.2% and 81.1% of respondents, respectively).

5. Discussion and conclusions

This study intends to outline the current state of the Portuguese healthcare sector organizations in regards to innovation, in order to study the extent to which these organizations are overcoming the challenges they face through the introduction of products, processes or other innovative methods.

The assessed organizations operate mainly in their local and regional markets, and their annual turnover comes mostly from those markets. There is a low level of internationalization in this sector, which may limit the sustainability and growth of these organizations, given the small size of the domestic market. The most innovative organizations in any of the types of innovation analyzed belong to the groups of healthcare facilities with inpatient service, drug-manufacturing activities, and manufacture of orthotic and prosthetics devices and medical-surgical instruments.

The majority of the surveyed organizations introduced product or process innovations, which reveals some momentum, although this is sometimes confined to a domestic context. In the case of product innovations, most new or significantly improved goods and services were developed internally, with moderate external cooperation for the development of innovations. Nevertheless, we should stress the fact that more than half of the products introduced were new to the market and not just to the company.

This data shows an interesting duality in the sense that, on the one hand, these organizations reveal innovation potential, but on the other hand we realize there is a

tendency for the development of these activities in isolation. The initiative also shown in the development of new goods or services only for the company suggests that these organizations are responsive to the market, aware of the introduction of new products by competitors, and trying to cover this offer.

Process innovation, in its turn, involves greater openness to external cooperation, especially since it covered areas that require knowledge and skills that fall outside the scope of the nuclear activities of these organizations. We are talking, in particular, about computer, accounting and maintenance systems. These results reveal some distrust in the development of partnerships and therefore a somewhat traditional approach to innovation, since innovation activities with a potentially direct impact on turnover tend to be more closed and protected.

Reinforcing these observations, we find that intramural R&D activities carried out occasionally or continuously were predominant, as well as the enhancement of internal resources, both human and material. Furthermore, looking at the sources of information chosen by the organizations, we observe once again an inner focus on the creation and development of innovation projects. This is emphasized by the relevance given to trade fairs, exhibits, and scientific, technical or professional journals as a source of information. Market and institutional sources are considered less important, revealing an isolated scenario in R&D.

It is important to examine the observed data from the point of view of the impact innovation has on the organizations' operating results. With regards to those that have introduced product innovation, approximately 80% of its turnover is composed of pre-existing products, while to 45% of the organizations products new to market did not have any expression whatsoever. Despite efforts to develop new goods and services, it appears that they have small influence on the turnover, at least during the period following its introduction.

It is also striking that products new to the company show slightly more encouraging results, which seems to be due to the fact that these products have already proven track record in the market and, therefore, organizations decide to include them in their offer. It is thus assumed, that the level of penetration of these goods and services in their respective markets has been assessed and taken into account in the decision to develop them internally. Supporting this conclusion, is data concerning the innovation activities that were developed, in which we find that about one-third of the surveyed organizations carries out activities related to the launch of new products to the market, such as market research and advertising campaigns.

The main objectives pointed out by the surveyed organizations to introduce product or process innovations were broadening the product range and improving its quality, which reveals a focus on customers and market, in terms of the milestones to achieve. The goals set to the introduction of organizational innovations are in line with these findings, in the sense that a great importance is attached to reducing the response time to the needs of customers or suppliers, as well as to improving the quality of products. Improving the ability to develop new products or processes, reducing costs per unit produced and improving internal and external communication are also quite highlighted. Consequently,

we emphasize the relevancy given to the customer in the introduction of innovations, which is restated by the data on marketing innovation, indicating the increase in market share and the introduction of products in new customer groups as main objectives.

It should be noted that marketing innovation in healthcare facilities with inpatient service is focused on introducing new techniques or means of communication for the promotion of goods or services. In a context where the offer of such services has been growing, it is pertinent to take on similar actions in order to promote services from each organization. In case of the introduction of new pricing policies, it should be noted that only 7% of the drug manufacturing companies did so, despite the fact that this activity has had some expression in other groups. This situation reveals a market with little flexibility in pricing.

To the creation and development of innovation projects, the surveyed organizations favor suppliers, consultants, laboratories or private R&D institutions, and higher education institutions as cooperation partners, mainly located in Portugal and other European countries. Therefore, we find a form of cooperation strongly oriented to R&D and relatively less market oriented, which reinforces some of the conclusions already mentioned. Exception is made for cooperation with entities located in other European countries, in which cases the competitors are mostly sought for this purpose.

It was also observed that the studied organizations have a relatively low financial support by public funds in their innovation activities, considering tax incentives, subsidies, subsidized loans or bank guarantees. Of the companies with more innovation activities we highlight the manufacture of orthotic and prosthetic devices and medical-surgical instruments group, as the one having the lowest number of organizations receiving this kind of support. It should also be noted that within this group, regarding marketing innovation, almost all companies that innovated made it through changes in aesthetics or packaging of goods, as did the pharmaceuticals manufacturing companies, which reveals a strong market orientation.

The health sector in Portugal is currently facing some critical challenges such as the population ageing, the increase of technological complexity and cost structure, the need to control spending and still be able to maintain the health policy and the sustainability of the system.

The results presented here are consistent with data from the Innovation Union Scoreboard, which classified Portugal as a moderate innovator, with a special performance of the small and medium enterprises (SMEs) in what concerns the introduction of product, process, marketing and organizational innovations.

In summary, the reasons that primarily motivate organizations in the health sector in Portugal to innovate are the improvement of the product quality and of the responsiveness to customers and suppliers, the diversification of product range and boosting their capacity to develop new products. Different types of organizations adopt different innovation strategies, according to their market and their current situation, which reflects the materialization of contextual innovation policies, in line with the theoretical developments of today.

6. Practical implications

The results of this study are relevant to researchers and the general public and even public and private managers, given the fact that it presents an in-depth analysis of the different forms of innovation of Portuguese healthcare organizations. This results are also a contribution to the definition of public policies that foster the innovative performance of organizations in this sector. This study presents a set of suggestions to clarify the role of innovation in Portuguese healthcare organizations.

7. Research limitations

This study has a limitation: the data accessed in the database only comprises a two-year period (from 2008 to 2010), being the analyzed period before the Portuguese economic and financial crisis, which culminated with Troika's intervention. For this reasons prudence is important in the analytical generalisation of the results of this study.

8. Future lines of research

In future works, we suggest an analysis of a longer timeframe in order to confirm the results obtained.

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