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DRIVERS OF MARKETING INNOVATION IN PORTUGUESE FIRMS

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Abstract

This article aims at identifying and analyzing the drivers of innovation capacity of marketing in the context of Portuguese firms. From this standpoint, a theoretical framework is considered, which comprises the characterization of marketing innovation, as well as the determinants that underlie it. Based on the literature several research hypotheses are formulated, which are tested using secondary data provided by the “Observatório da Ciência e do Ensino Superior - OCES” - Observatory of Science and Higher Education, belonging to the “4º Inquérito Comunitário à Inovação – CIS 4”- 4th Community Innovation Survey-CIS, supervised by EUROSTAT. The method used is the logistic regression model. The results show that the variables included in the factor R&D pertaining to internal R&D activities, acquisition of machinery, equipment and software, acquisition of other external knowledge and performance of other procedures, and the factor marketing activities, influence the propensity of firms to innovate in marketing.

Keywords: innovation, marketing innovation, innovative capacity, Community Innovation Survey

JEL Classification: O31, M31

Introduction

Derived from the increasing globalized economic activity, the gradual integration of markets and the continuing evolution of consumer needs and desires there are new challenges to firms which increasingly strive to innovate, especially from the perspective of marketing. As such, marketing innovation imposes itself as a determinant factor of business success, being one of current events with major interest.

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This study aims to analyze and identify the driver factors of innovative capacity of marketing of firms, focusing its analysis in the study by Portuguese industrial firms, commercial and services. In this study, considering the innovative capacity of marketing of the firms: marketing innovation and having as its base the pioneer factor, two different types of innovation are distinguished: "innovation in design and packaging of goods and services" and "innovation in sales methods and distribution".

To empirically test the hypotheses, relatively to each factor, secondary data is used provided by OCES, belonging to the CIS at: CIS 4, supervised by EUROSTAT. The data obtained apply logistic regression models.

The paper is structured as follows: in section two it is based on relevant literature on the topic of marketing innovation, it proposes a set of explanatory factors for marketing innovation and it formulates the hypotheses to be tested empirically in the statistical model. Section three defines the sample, describes and characterizes the variables used in the empirical study and presents the logistic regression model, whose analysis takes place in section four. The final section presents the conclusions and suggests the holding of future investigations.

1. Literature review

The marketing innovation has been experiencing a growing theoretical and empirical interest over the past years. The concept of marketing innovation can take many forms, for example, successful new products, more creative marketing programs, new and better sales techniques performance (Atuahene-Gima, 1996; Chou, 2009; Suciú et al., 2011). According to the CIS 4 (2005), the marketing innovation is the implementation of a new concept or marketing strategy, different from the existing methods of marketing in firms, and therefore, it has not previously been used and is contemplating changes in design or product packaging, in the distribution and promotion of products or, in the pricing policy, which are subject to an increasing penetration of goods and services of the company in the current market or new markets. Heunks (1998) and Shergill and Nargundkar (2005) define marketing innovation as an innovation in marketing programs or marketing methods, including the four P's of marketing: product, price, promotion and place. Harms et al. (2002) consider innovation as a new element of the marketing mix which is capable of promoting new and obvious advantages for companies which according to Chou (2009) are the central element of differentiation and superior performance.

Of the proposed definitions, it follows that the marketing innovation utmost relevance is in the understanding of consumer demand, to the extent that a new product or service is developed for a particular market, where potential value and growth of that market determine the success of product or service (Trienekens et al., 2008).

The marketing innovation, in view of Kim and Mauborgne (1997), can occur at three distinct levels: (i) product level, corresponding to the physical product, (ii) service level, supported by sources such as maintenance, support service to the buyer, warranty and training of distributors and retailers, (iii) delivery level which includes logistics and channels used to deliver the product to the buyer. These aspects, on the one hand, account for most of the performance of firms, as it is the value of innovation throughout the different levels, which makes the difference between organizations of high and low growth

and, and on the other hand, show a clear relationship between innovation, the purpose of marketing and the role of the consumer / buyer.

In this context, and according to Waarts (2005), the main task of marketing is to create an innovative source of supply, based on those needs. Also Maciariello (2009) and Zaharia et al. (2010) states that the major objective of innovation is creating new markets for the organization, in the sense that new expectations are enhanced, new standards and new ways of meeting the target market are set up. In following, Drucker (1999) notes that the primary purpose of marketing in the innovation context, is not only to sell, but rather to understand the consumer, so that the marketing concept should focus mainly on determining the needs and desires of consumers and in promoting their long-term satisfaction.

Of the works of the authors presented, it appears that innovations constitute the basis of the firms and the market success, being that, to Harms et al. (2002) and Năstase and Kajanus (2008), the lasting and sustainable growth of the economy can only occur if firms constantly make new products or services available, for which their investments should be boosted in R & D. In this perspective, the marketing innovation may be very relevant in the future development of the markets, although for this, two essential requirements must be met: direct contact of the firm with the customer and positioning oriented towards competition. Concerning the first aspect, the clients are, of course, the pivot elements during testing of the new product or service, so the satisfaction condition demonstrated at first conditions all of the strategic planning of the firm. With respect to positioning and due to changing market conditions, its important to permanently increase, in the sense that only firms that contribute with constructive solutions can successfully expand to other markets (Harms et al., 2002).

In short, the ability to successfully generate a variety of new products and services and find new ways to communicate and to distribute is vital for many organizations, once the support of marketing activities is a key factor for them, so that they adapt to market and environmental changes, new technologies and anticipate the actions of competitors.

Given the conceptual framework studied and even though marketing innovation is a very recent area, there is already some concern from the authors to identify and define determinants factors of marketing innovation, elements of internal and external resources of the organization. In reference to the first situation, take for example, the work by Waarts (2005) and Maciariello (2009), who identify the degree of incorporated technology and the marketing activities developed as determinants of marketing innovation. With respect to external factors, Drucker (1999) and Harms et al. (2002) emphasize the analysis of market opportunities, understood in the form of R & D activities, as the main determinant of the innovative capacity of marketing of firms.

The explanatory factors of marketing innovation are not limited to the factors mentioned. However, intending to analyze the process of marketing innovation at the business level and considering the literature review made, in this work, the emphasis is on the factors related to technology, the R & D and marketing activities, as these factors affect in an integrated manner and in the form of interactions the marketing innovation of the firm.

The factors which will be studied in this research are the result of predetermined by the 4th Community Innovation Survey (CIS 4), namely technological capacity, marketing and R & D activities. The latter include: internal R & D activities, external acquisition of R & D, acquisition of machinery, equipment and software, acquisition of other external knowledge

and implementation of procedures and technical preparations. Based on the factors listed in the table above, a set of hypotheses was developed in order to be tested empirically, in order to be able to determine whether the factors mentioned influence the marketing innovation occurred in firms.

The first hypothesis relates the technological capacity with the marketing innovation of firms. Technological capacity refers to knowledge, skills and abilities needed to assimilation, adaptation or modification of existing technologies or developing new technologies, as it will be much higher, as more companies are empowered in terms of skilled human resources and training (Hofman et al., 1998, Romijn and Albaladejo, 2002). According to the CIS 4 (2005), training can occur at the internal or external level in firms, with the sole purpose of developing or introducing new products or new or improved processes in the market, therefore meeting the needs and desires of the target audiences.

In accordance with the above and according to Hofman et al. (1998) and to Romijn and Albaladejo (2002), firms with greater technological capacity, that is, with highly skilled labor and with higher levels of training are more receptive to the absorption and reproduction of new knowledge, therefore, showing, a greater capacity in developing innovations. Also the studies of Silva (2003) and Silva and Leitão (2009) confirm that the qualification of personnel, in terms of higher levels of education has a positive and significant effect on the propensity for firms to innovate, while Guijarro et al. (2009) report a lack of qualification and training of staff as a major barrier to innovation. As the above, the following hypothesis is established:

H1: The technological capacity is positively related to the propensity of the firm to innovate in marketing.

The R&D and innovation require the design and development of new products, services or processes, or the improvement of existing ones (CIS 4, 2005), implying the creativity of the firm and being, therefore, very connected with the innovation of marketing. Considering the underlying 4th Community Innovation Survey, the R&D can integrate as follows: (i) carrying out internal activities of R&D, (ii) external acquisition of R&D (iii) acquisition of machinery, equipment and software, (iv) acquisition of other external knowledge, and (v) other procedures.

Given the performance of R&D internally by the firm, it is taken into account all creative work developed to increase the knowledge base, as well as the use of knowledge into new products and processes (CIS 4, 2005). According to Masso and Vahtera (2008), Frenz and IETT-Gillies (2009) and Silva et al. (2010), the greater the investment in such activities, the more likely the company will develop innovations. From the above the following hypothesis is assumed:

H2a: The performance of internal R & D activities is positively related to the propensity of the firm to innovate in marketing.

The external acquisition of R & D considers the R & D activities, equally creative, with the purpose of enhancing the internal knowledge base within the company, but that executed externally by other public or private firms or institutions of R&D (CIS 4, 2005). According to Freeman (1987), Nelson and Rosenberg (1993) and Chesbrough (2003), the external sources of knowledge have an important role in the innovation of the firm, and is even linked to its performance. In their work, Frenz and IETT-Gillies (2009) and Harris and Li

(2009) conclude that the external acquisition of R & D is positively related to innovation in the firm. Supported in these findings, the following hypothesis is presented:

H2b: The external acquisition of R & D is positively related to the propensity of the firm to innovate in marketing.

According to Youtie (2006), any type of innovation, whether in product, process, organizational or marketing embodies in its implementation the acquisition of machinery, equipment, computers or software. To the author, the acquisition of such goods is directly related to the benefits of innovation, which are visible through the quality and variety of goods, market share, increased capacity and production flexibility, as well as reduced time for product delivery and services. Also Sanchez (1994) concluded, in his work, that the technological equipment has a major impact on innovations, including those that occur in industrial firms. As such, the following hypothesis is set up:

H2c: The acquisition of machinery, equipment and software is positively related to the propensity of the firm to innovate in marketing.

The acquisition of other external knowledge, specifically related to patent property rights, non-patented innovations, know-how, etc. (CIS 4, 2005) is an indicator which has a strong influence on innovation, as referred by Millot (2009) and by Silva et al. (2010). According to Millot (2009), this particular type of knowledge is positively related to innovation, and the association is particularly high in industrial sectors oriented towards knowledge-intensive and high technology. Given these facts, the following hypothesis is set up:

H2d: Acquisition of other external knowledge is positively related to the propensity of the firm to innovate in marketing.

Finally, the remaining procedures and techniques are still considered as part of R&D and innovation activities which have not been addressed previously, but are also at the service of product development and new or improved processes, possibly related to the experience enhancement, skills and know-how of the firm, indicating, for this the following hypothesis:

H2e: The completion of technical preparations and procedures is positively related to the propensity of the firm to innovate in marketing.

The importance of marketing activities in the innovation process of the firm is evidenced in the work of Kim and Mauborgne (1997), Trienekens et al. (2008), Chou (2009) and Silva et al. (2010). Marketing activities are directed towards the introduction of new products or significantly improved products in the market, helping to differentiate the firm, emphasizing that the activities that are geared primarily through the study of the needs expressed in the market have a crucial role in the innovation business process. Given the importance of this variable in the context of marketing innovation, the following hypothesis is assumed:

H3: The firms that perform marketing activities have a higher propensity to innovate on marketing than other firms.

In order to clarify the hypothesis, we present the summarising table no. 1.

Table no 1: Synthesis of Hypothesis and Variables

Hypothesis	Independent Variable	Dependent Variable
<i>H1: The technological capacity is positively related to the propensity of the firm to innovate in marketing.</i>	Technological capacity	Marketing Innovation
<i>H2a: The performance of internal R & D activities is positively related to the propensity of the firm to innovate in marketing.</i>	R&D Activities	
<i>H2b: The external acquisition of R & D is positively related to the propensity of the firm to innovate in marketing.</i>		
<i>H2c: The acquisition of machinery, equipment and software is positively related to the propensity of the firm to innovate in marketing.</i>		
<i>H2d: Acquisition of other external knowledge is positively related to the propensity of the firm to innovate in marketing.</i>		
<i>H2e: The completion of technical preparations and procedures is positively related to the propensity of the firm to innovate in marketing.</i>		
<i>H3: The firms that perform marketing activities have a higher propensity to innovate on marketing than other firms.</i>	Marketing activities	

The hypotheses made here were empirically tested taking into account the design research that is presented next.

2. Research design

At this point there was a selection of the population under study, which in this work corresponds to the Portuguese firms, as well as the characterization of the extracted sample. The method of data collection was defined and its characterization in terms of dependent variables, independent and control was carried out. Finally, the method of data analysis: The logistic regression model.

2.1 Presenting data: population and sample

The data used in this investigation have been collected from OCES, in collaboration with the “Insituto Nacional de Estatística –INE” – National Statistics Institute, through the CIS 4. Data collection took place between June and November 2005, although the reference periods to which they relate are from the years 2002-2004.

The population on which the analysis focuses includes all industrial, trade and services and Portuguese firms with at least 5 workers, which at the date of application of the questionnaires were registered on “Ficheiro Geral de Unidades Estatísticas do INE – FGUE” - General Register of Statistical Units, representing 22749 firms. The sample was built by the INE, based on methodological specifications imposed by EUROSTAT, covering a total of 4643 firms.

Thus, Portuguese firms are regarded as innovative in marketing, during the period from 2002 to 2004; it was introduced some marketing innovation related to (i) changes in design or packaging of a product or service or (ii) with new and significantly improved of sale or distribution methods .

2.2 Variables

The innovative marketing is the measure obtained from the information gathered at the level of marketing innovation, being considered as the dependent variable. This dimension is presented as a dichotomous variable based on binary data: it takes the value "0" for firms that did not innovate in marketing and the value "1" for those who innovated.

In regards to the independent variables, these are represented by the technological capacity, R&D and marketing activities. For this investigation, it was only taken into account whether or not the firm has implemented some of these activities, assuming also, as a dichotomous variable based on binary data: it takes the value "1" when performed innovation activities and the value "0" if otherwise. The same variables were used in empirical studies of Sanchez (1994), Kim and Mauborgne (1997), and Vanhter Masso (2008), Trienekens et al. (2008), Frenz and IETT-Gillies (2009), Harris and Li (2009), Millot (2009), Silva and Leitão (2009) and Silva et al. (2010).

As in other studies (Silva and Leitão, 2009, Moreira 2010, Moreira and Silva, 2010 and Silva et al., 2010) a control variable was used in this investigation, linked to business characteristics: the business dimension. To measure the business dimension two variables have been created: small and medium firms, which take the value "1" and large firms that takes the value "2". The definition of these categories had dimensional underlying the classification proposed by the European Commission (EC, 2006), which considers members of small and medium firms employing up to 250 workers and large commercial units with 250 or more workers.

2.3 Method: Logistic Regression Model

Based on the theoretical review of the literature, it was found that the innovative capacity of marketing is a complex phenomenon influenced by a wide range of factors. In combination with the need to explore the relationships between these factors and the capacity of innovative marketing, the aim is also to study the statistical relationship of a dependent variable in relation to more than one explanatory variable, so it was decided to use the Logistic Regression Model (Logit Model). It was verified that this model has been widely used in empirical studies analysis (acc. Masso and Vahtera, 2008; Silva and Leitão, 2009, Moreira 2010, Moreira e Silva, 2010, among others), thus presenting itself as an appropriate analytical technique for the proposed conceptual model, since it includes a categorical dependent variable and several independent variables, as presented below:

$$MI = \beta_0 + \beta_1 \text{Form} + \beta_2 a \text{ID}_i + \beta_2 b \text{ID}_e + \beta_2 c \text{Aq}_m + \beta_2 d \text{Aq}_c + \beta_2 e \text{Op} + \beta_3 \text{Act}_m + \beta_4 \text{Dim} + \epsilon_i$$

Where: MI = Marketing Innovation; ϵ_i = residue; β = coefficients; Form = training; ID_i = R & D internal activities; ID_e = external acquisition of R & D Aq_m = acquisition of machinery, equipment and software; Aq_c = acquisition of other external knowledge; Op = other procedures; = Act_m development of marketing activities; Dim = dimension.

In sequence, the application of the logistic regression model to the data from CIS was conducted in order to obtain results, which will be presented and discussed.

3. Data analysis

At this stage of investigation, logistic regression models were applied to data from CIS, testing the proposed model. The statistic of Wald was used as statistics test to analyze the behavior of the variables and the fit of the model. The logistic regression results for the Marketing Innovation Model are presented in table no. 2.

Table no. 2: Logic regression models' results for marketing innovation

Models	Model A	Model B	Model C				
	Parameter Estimator	Parameter Estimator	Parameter Estimator	S.E	Wald	Sig.	Exp (B)
Technological Capacity	001						
Intramural (in-house) R&D	386	0,409	0,371	0,113	10,844	0,001	1,450
Extramural R&D	070						
Acquisition of machinery, eq. software	0,341	0,348	0,382	0,110	12,025	0,001	1,465
Acquisition of other external knowledge	0,466	0,482	0,374	0,125	8,927	0,003	1,453
Other procedures and techniques	467	0,468	0,447	0,113	15,614	0,000	1,563
Marketing activities	569	1,574	1,581	0,107	216,915	0,000	4,858
Dimension firm			0,204	0,129	2,502	0,114	1,226
Constant	,099	-2,099	-2,335	0,152	234,469	0,000	0,097
Model Summary							
Correct predict (%)			81,9				
Qui-square			779,276			0,000	
Log likelihood			3573,572				
Number of cases			4114				

The results of the logistic regression for the model show that not all estimates of the regression parameters are statistically significant at 5%. For the fit of the final model (Model C), the results show that the predictive capacity of the model is 81.9%, resulting from the comparison between the values of the response variable predicted by the model and the observed. The statistic test of qui-square has a value of 779.276 with an associated evidence value of 0,000. The statistics of the log-likelihood, with a value of 3573.572, confirms the global significance of the model. This latest model follows the introduction of a control variable in Model B, in order to analyze the robustness and consistency of the explanatory variables.

As for H1, there is the intent to test the influence of technological capacity in the capacity of a firm to innovate in marketing, that is the skill or ability for firms to develop marketing innovations. Technological capacity is measured by participation in training activities. According to the literature review performed, training is assumed as a prerequisite of innovation in firms, enabling the increase of accumulated knowledge and an improvement in technology fields. Thus, training activities mean the internal or external training of the staff in a firm in order to enable the development and introduction of products or new or improved processes in the market (CIS 4, 2005). However and according to the results of the model, the technological capacity explanatory variable has no statistical significance and therefore it is not possible to confirm the hypothesis H1.

The hypothesis H2a is related to the R&D activities and it aims to test the effect of performing R&D activities internally by the firm regarding the capacity of the firm to innovate in marketing. Considering the model results, it is confirmed that the R&D activities performed internally by the firm has positive and significant influence on the capacity of the firm to innovate in marketing, as indicated by the value of evidence associated with the variable (.371). Thus, it appears that firms which perform such activities have advantages in marketing innovation compared to other firms, as attested by the value associated to the

marginal effects in the variable (1.450), corroborating the results achieved in studies of Masso and Vahtera (2008), Frenz and IETT-Gillies (2009) and Silva et al. (2010).

The hypothesis H2b aims to empirically test whether the acquisition of R&D activities of other companies or institutions for R&D public and private, is related to the capacity of the firm to innovate in marketing. However, the results show that the acquisition of external R&D variable has no statistical significance in the model, so nothing can be concluded about the effect of this factor.

The hypothesis H2c associates the capacity of the firm to innovate in marketing with the acquisition of machinery, equipment and software with the purpose of producing goods or new or improved services or to implement new or improved processes. Through the results of the model, it appears that the acquisition of machinery, equipment and software has a significant and positive effect on innovation in marketing (0.382). This reinforces the findings of studies by Youtie (2006) and by Silva et al. (2010). Considering the marginal effects associated, it appears that firms which purchase machinery, equipment and software, have an advantage of 1.465 in developing marketing innovations in comparison to other firms. Indeed, the acquisition of machinery, equipment and software is positively related to the capacity of the firm to innovate in marketing.

The hypothesis H2d relates the capacity of the firm to innovate in marketing with the acquisition of other skills such as patent property rights, inventions, know-how, among others. Through the model results, the conclusion is that this variable has statistical significance, as firms which acquire knowledge externally have advantages in marketing innovation in relation to firms that do not perform this type of acquisition in the course of their activities, as it has already been demonstrated through the studies of Millot (2009) and Silva et al. (2010). By examining the model parameters, it appears that the acquisition of external knowledge has a positive and significant influence on innovation in marketing (0.374) and simultaneously provides firms with an advantage in innovation at the dimension level of 1.453 times higher, compared to firms that do not acquire this type of inputs in the market. Thus, this confirms the hypothesis H2d.

The hypothesis H2e aims to empirically test the relationship between the performance of procedures and technical preparations and the capacity of the firm to innovate in marketing. The model results show that the performance of procedures and technical preparations by firms has a positive and significant effect on marketing innovation, with a variable presenting an associated point estimate of 0.447, therefore it can be said that firms that perform procedures and technical preparation are more prone to developing marketing innovations than other firms, besides from showing a lead of 1.563 to innovate in marketing. It is thus confirmed the hypothesis H2e.

The final hypothesis of this model combines the performance of marketing activities with the capacity of the firm to innovate in marketing in order to test whether indeed there is some relationship between these two variables. Given the results of the model, it appears that the implementation of marketing activities is related to a positive and significant effect on marketing innovation, which is evidenced by the point estimate of the explanatory variable (1.581). It follows that firms that perform marketing activities are more likely to innovate in marketing than other firms holding an advantage of 4.858 in developing marketing innovations over the others. Given the above, the hypothesis H3 is confirmed.

Conclusions

This study aimed to identify and analyze the determinants of innovative capacity in marketing of Portuguese firms, considering, based on literature review, a whole range of factors likely to affect the marketing innovation and, consequently, the business innovative capacity. In order to increase understanding of marketing innovation and to identify its key determinants, several hypotheses were formulated for sustained research in the literature review undertaken on the topic.

This research highlighted a set of push factors of the innovative capacity of marketing, which led to the formulation of hypotheses empirically tested: technological capacity, R&D and marketing activities.

The results of model indicate that firms that perform marketing activities or R&D internally or perform other procedures designed to innovation are more likely to innovate in marketing than other businesses. Similarly, also the firms which buy machinery, equipment or software or even other external knowledge, have advantages in innovation in marketing. According to the results obtained such practices have significant positive effects on innovation in marketing, so the higher the investments in acquisition of machinery, equipment and software, R&D internal activities to the acquisition of external knowledge in marketing activities and other procedures, the greater the propensity of firms to innovate in marketing.

From the critical reflection based on the conclusions presented, and also from the principles underlying the marketing innovation, several considerations have resulted, which must be understood and adopted by key decision-makers, business leaders and politicians with a view fostering marketing innovation. Thus, one of the first considerations is related to the need to promote initiatives related to research and development in firms, coupled with measures and financial support programs in order to enhance knowledge and skills necessary for marketing innovation.

Otherwise, it is also important to create measures that stimulate the internationalization of business or possibly for export, since the opening of markets provides a flow of knowledge, ideas and projects, among others, serving to stimulate innovation in marketing business and, consequently, its differentiation and improvement of the competitive position.

Finally, it is also indispensable the awareness of firms of the continual and permanent changes and markets, evidenced particularly in terms of change of needs, tastes and desires of consumers, who increasingly impose themselves as globalized elements. Thus, it is clear the execution of activities with a careful prospection which serve as the support for the development of new goods and services, capable of promoting the one hand, the long-term satisfaction of the market and, moreover, a competitive superiority and firm performance.

The main contribution of this work was the study of marketing innovation alone, rarely explored in literature, as well as the determinants of innovative capacity of marketing of Portuguese firms, thus attempting to increase understanding of the subject. Therefore, and on one hand, the enrichment of literature on innovation and marketing has been promoted, on the other hand, the increase in conceptual studies of the area, reducing in this way the large gap found in this area of research, partly derived thematic of marketing innovation is still underused, especially in terms of manuals, papers or presentations at conferences, both internationally and in the Portuguese context.

The main limitations of this study result from the restriction of the data has not been made available, and in its entirety the result of 4 CIS, for example, the level of training of

employees in firms. Also, it was not been possible, a longitudinal study, considering the data from the CIS in June, to assess evolutionary trends within the marketing innovation in the Portuguese context.

To allow new empirical evidence about the marketing innovation it is proposed a repetition of the performance of the empirical study with data from other European countries where they held the 4th Community Innovation Survey. On the other hand, it is pertinent to complement the study with data from the CIS in June, to enable an analysis of marketing innovation in a broader horizon, or even repeat the research based only on these data, obtaining updated information, enabling the assessment of evolutionary trends in marketing innovation developed by firms.

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