

Exploring Product Innovativeness Determinants in SMEs

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Abstract

This PhD thesis suggests a shift in emphasis from organisational to product innovativeness (PI), a rather overlooked aspect within the organisational innovation literature. Drawing input from evidence on relations of industry- and firm-specific factors to product innovation along with qualitative information from the Greek context, it adopts a conceptual framework of strategic importance to explore PI determinants in SMEs. Path analysis models pertaining to a dataset of 150 manufacturing SMEs in Greece are applied to examine both direct and indirect effects of firms' external and internal strategy-related characteristics on PI, captured in three dimensions, namely product newness to customers, product newness to the firm and new product uniqueness. In a rather supportive way, cluster analysis and one way ANOVA are employed to identify groups of firms, which are indicative of different levels of PI, as well as differences across these groups on external and internal firm characteristics. Based on the findings, the author outlines theoretical and managerial implications.

1. Introduction

The role of innovation as a crucial driving force of economic development is widely acknowledged. In particular within the business setting, innovation is often considered to be a vital source of strategic change, by which a firm generates positive outcomes including sustained competitive advantage. For these and other reasons, innovation has for many decades been subject to thorough analysis and research.

Innovation itself is a broad concept that is conceived in a variety of ways. Prior attempts to capture what really constitutes the term of innovation have resulted in widely varying conceptualisations. Innovation and innovativeness are either distinguished from each other or used interchangeably (Damanpour, 1991). Nevertheless, innovation seems to incorporate the adoption or/and implementation of "new" defined rather in subjective ways, whereas innovativeness appears to embody some kind of measurement contingent upon an organisation's proclivity towards innovation. Widely varying conceptualisations and operationalizations of the organisational

innovativeness construct appear to be the main cause of major deficiencies in the research of organisational innovativeness determinants. This PhD thesis focuses on product innovativeness, a rather overlooked aspect within the innovation variance research (Subramanian and Nilakanta, 1996) or the organisational innovativeness research (Wolfe, 1994). In particular, it suggests a shift from the general question "what factors influence the firm's proclivity to innovate" to a more particular one "what factors affect the innovativeness of a new product", for which little is currently known (Ali, 1994; Calantone & Cooper, 1981; Fritz, 1989; Gatignon & Xuereb, 1997; Yoon & Lilien, 1985).

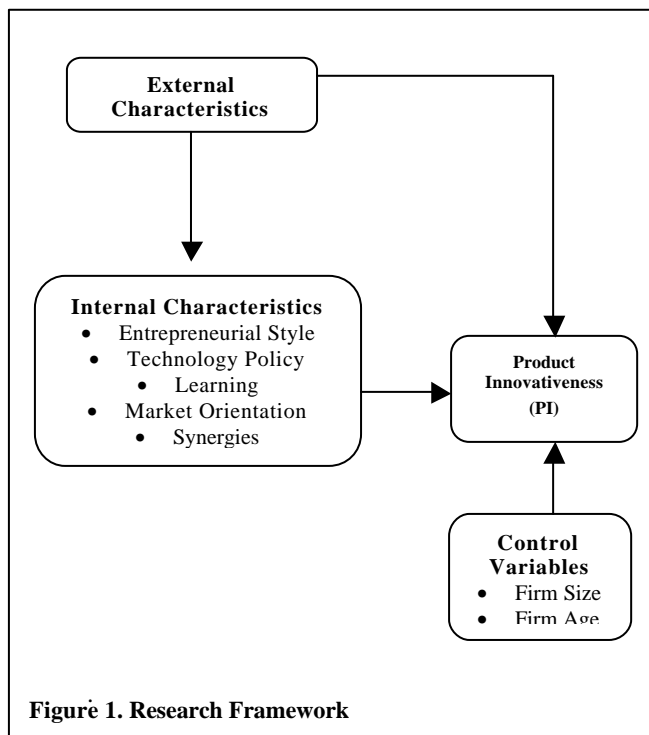
Consequently, the interest of this research focuses on an expansion of the relation between industry- and firm-specific characteristics with PI and how this can be shaped in SMEs, which constitute the vast majority of enterprises in Greece, like in most European countries. Undoubtedly, SMEs hold increasing attraction for investigation, given their significant share in innovation (Dutta & Evrard, 1999) and the strategic importance they attribute to innovative new products. In particular, the SMEs under analysis come from two traditional, though dynamic, manufacturing industries, those of food & beverages and textile. Both industries account for the 39% of the total sales and 35% of the total net profits in the Greek manufacturing sector while constitute approximately 44% of the total number of manufacturing enterprises. Their choice is also dictated by (1) the importance of these industries for the Greek economy in terms of i) manufacturing employment (51%), ii) manufacturing production (50%), and iii) contribution to GDP (39%); and, (2) the opportunity they provide for studying what determines the proclivity of firms within traditional industries towards the introduction of more innovative new products under conditions of heightened global competition.

This paper constitutes an overview of the PhD thesis titled "Exploring PI determinants in SMEs" and is organised as follows. After this introductory section, the research framework will be discussed in the second section. This is followed by a brief presentation of the research methodology. The final section outlines the empirical findings along with their theoretical and managerial implications.

2. Research Framework

This doctoral study could be placed among studies carried out within the innovation variance research (Subramanian and Nilakanta, 1996) or the organisational innovativeness research (Wolfe, 1994). In particular, it focuses on PI, captured in the degree of uniqueness and newness of a new product. By synthesising parts of the strategic management, strategic marketing and organisational behaviour literatures, it focuses on the effect of external and internal strategy-related characteristics of the firm.

This study adopts a conceptual framework of strategic importance to identify some underlying forces behind different aspects of the key concept of PI. In particular, it investigates the direct effects of internal strategy-related characteristics (namely entrepreneurial style, technology policy, learning, market orientation and synergies) along with the direct and indirect effects of industry-specific factors (see Figure 1).



In order to facilitate the development of the research framework beyond the literature review, the findings of a qualitative study were also embodied. These are based on qualitative data collected through semi-structured interviews with industry experts from two industry-specific support organisations¹. In particular, they were asked to

¹ ETAT S.A. and CLOTEFI S.A. are industry-specific Research and Technological Development companies of the General Secretariat of Research

express their opinions concerning Greek SMEs' characteristics (inside and outside the company) as well as their impact on product-related innovative behaviour. Although these viewpoints are confined to the Greek context, they nevertheless are constructive in understanding the conditions prevailing in these specific fields and the grasping of factors that shape SMEs' innovative performance in the respective industries. Thus, opinions expressed by industry experts though supplementary, shed additional light on the extent to which the aforementioned characteristics influenced the innovativeness level of new products in terms of newness and uniqueness.

This conceptual framework formulates six (6) general research hypotheses regarding the direct effects of external and internal strategy-related characteristics of the firm. Since these characteristics constitute conceptual configurations, some of which pertain to multidimensional phenomena, additional, but more specific, research hypotheses are developed to allow for testing the influence of their dimensions. In particular, external environment is captured in three dimensions, namely uncertainty, heterogeneity and munificence; entrepreneurial style is captured in two dimensions, namely risk-taking and proactiveness; market orientation is captured in three dimensions, namely customer orientation, market-focused strategy and inter-functional coordination; and, synergies are captured in two dimensions, namely marketing synergies and technological synergies. At the same time, five (5) general research hypotheses are additionally formulated concerning the indirect effects of industry-specific characteristics through internal strategy-related characteristics on PI. Finally, a cohesive research hypothesis is formulated, which relates the aforementioned hypotheses to the firm performance. This aims at identifying potential differences across firms of high and low profitability on PI determinants. In this study, all the effects are examined while controlling for firm size and age.

PI, the dependent variable, constitutes an essential part of organizational innovativeness while referring to a phenomenon manifested by companies with innovative activity in products. In this context, it is measured based on three distinct dimensions that reflect the degree on which a new product or new product category is (i) new to the firm (i.e., the "product newness to the firm" dimension), (ii) new to the customers (i.e., the "product newness to the customers" dimension), and (iii) unique in terms of its characteristics as compared to competitive products (i.e., the "new

and Technology (Ministry of Development) for food & beverages and textile respectively.

product uniqueness" dimension). These dimensions are based on perceived assessments of the respondents that capture both the firm's and the customer's perspective (Danneels & Kleinschmidt, 2001; De Brentani, 2001; Olson, Walker & Ruekert, 1995).

3. Research Methodology

For the scope of this doctoral study, a structured questionnaire was designed to facilitate both data collection and quantitative statistical analysis.

The relevant population is defined as all independent firms with 10 to 250 employees and with less than 40 million Euro annual turnover, thus being in accordance with the widely accepted guidelines stipulated by the EU². According to the above stated criteria, a population of 1,614 Greek SMEs was identified using the ICAP database (Gallup's subsidiary), from which a random sample of 143 firms would suffice.

All firms in the sample should have fulfilled an additional criterion, which was necessary for measuring the main construct of PI. They should have introduced at least one new product or new product category during the last three years. Since this kind of information required the direct contact of all firms in the population and the cost of this process was very high, we initially extracted a random sample of 300 firms. These firms were contacted through phone calls in order to confirm whether the criterion in question was met. After confirming that 223 firms met this criterion, letters referring to the scope of the research study were sent, asking for participation. Finally, 150 firms agreed to cooperate (67% response rate), which is close to the required sample of 143 firms.

Data was collected by a structured questionnaire through personal interviews with the top management (managing directors 58%, marketing & sales managers 17%, financial managers 15%, others 10%).

Questions measuring the PI dimensions were based on the most important single new product or new product category that each SME considered in terms of sales turnover. More specifically, respondents (top managers) were asked to identify the new product or new product category introduced by their firms in the last three years with the highest contribution to their overall sales turnover. Of the 150 SMEs examined in this study, 129 referred to new product categories whereas 21 to single new products. However, the contribution of the new products or new product categories to

the sales turnover of SMEs studied was on average 22%.

From the sample of 150 firms, 69 belonged to the food & beverages industry and 81 to the textile industry. On average, these firms were in operation for 24 years. However, some of them were newly established (e.g., 1996) while others were far older (e.g., 1861). In addition, the sampled firms, which could be characterised as labour intensive, employed on average 65 people, from which about 19 were administrative while 46 were production or technical employees.

Data analysis was completed in two stages using SPSS for Windows (Release 7.5) and EQS (Bentler & Wu, 1995). In the first stage, tests were used to provide reasonable confidence that the measures used in this study were both valid and reliable. In the second stage, the main statistical analysis was carried out in order to test the research hypotheses. Path analysis models were used to investigate both the direct and indirect effects on PI, captured in three dimensions. In a rather supportive way, cluster analysis and one way ANOVA were employed to identify groups of firms, which are indicative of different levels of PI, as well as differences across these groups on external and internal characteristics.

4. Empirical Findings and Implications

Overall, the empirical results indicate that industry- and firm-specific factors relate to different dimensions of PI. This is in line with prior studies exploring innovativeness determinants, which have attributed differences in the empirical findings to the diversity of the innovativeness measures.

Based on the findings, this doctoral study confirms five (5) general research hypotheses regarding the direct effects as well as the differences across firms of high and low profitability on PI determinants. More specific, the internal strategy-related factors with a direct positive impact on PI are entrepreneurial style (risk-taking and proactiveness), two dimensions of market orientation (customer orientation and inter-functional coordination) and one dimension of synergies (technological synergies). In addition, one dimension of the external environment (heterogeneity) has a direct relation to PI, whereas the coefficients of the control variables, firm size and age, are significant.

The empirical results further indicate that the impact of industry- and firm-specific factors is different among the two sub-samples consisting of high and low profitability firms. To provide a better explanation, additional relations in the two sub-samples have been explored, using path analysis models. These involved the indirect effects of

² Published by the Official Newspaper of the European Communities on 30 April, 1996.

technology policy, proactiveness and learning together with the direct effects of the remaining factors on PI. The findings of interest concern only firms of low profitability, as they provide evidence in support of the indirect effects of proactiveness and learning through technology policy on dimensions of PI.

Finally, the empirical findings suggest also that (1) there are three groups of SMEs, which are indicative of different levels of PI, based on aggregation of its three-dimensional nature: *straight imitators* (low level), *product improvers* (high level) and *concept innovators* (moderate level); and, (2) these groups differ in terms of uncertainty, risk-taking, proactiveness, technology policy and firm size.

This study contributes to theory in two respects. The first relates to the shift in emphasis from organisational innovativeness to PI. A review of the organisational innovation literature (Subramanian & Nilakanta, 1996; Wolfe, 1994) appears enlightening in indicating the main causes of results' inconsistency within the research stream investigating organisational innovativeness determinants. In fact, these relate to major deficiencies around the concept of organisational innovativeness. In particular, there is lack of converging views concerning the treatment of organisational innovativeness either as a uni- or a multidimensional phenomenon, whereas no single measure of organisational innovativeness seems to be widely accepted. Consequently, the purpose of this shift, beyond the need to cope with these deficiencies, is to shed light on a more focused orientation of theoretical and practical value within this research stream. Unlike organisational innovativeness, PI is more specific and indicative of companies explicitly involved in product-related innovative activity. Although it is part of the organisational innovativeness phenomenon, PI is closer related to the way that new products are described than to the broad-based measurement of a firm's proclivity to innovate (Marquis, 1969; Davidson, 1976).

The second contribution involves a response to the recently articulated need for cross-level research on organisational innovation (Atuahene-Gima & Ko, 2001; Drazin & Schoonhoven, 1996). PI has been a key concept and measure in many empirical studies (Danneels & Kleinschmidt, 2001). Prior studies have extensively pursued an understanding of several issues concerning new products. Empirical research has investigated the new product development process (Cooper & Kleinschmidt, 1987; Wind & Mahajan, 1988), identified what steps a firm needs to carry out, and assessed the role of models in supporting and improving the new product development process (Mahajan & Wind,

1992). Despite the progress made by past research, the concept of PI has relatively been less specified as a dependent variable (Gatignon & Xuereb, 1997; Green, Gavin & Aiman-Smith, 1995). A recent overview of extant empirical research that has used the notion of PI (Danneels & Kleinschmidt, 2001) illustrates that such an investigation has been relatively less subject to empirical scrutiny. Similarly, Sethi, Smith & Park (2001) underline the absence of research examining factors that affect PI. In this respect, the intended focus on PI determinants would help to advance existing knowledge in theoretical grounds.

From a practical perspective, this study provides meaningful implications for top managers, given the increasing interest to improve SMEs' competitiveness through product innovation. As such, they are advised to focus on the relative importance of industry-specific and internal strategy-related factors in deciding the innovativeness level that will be embodied in a new product. In particular, top managers, who are involved in new product activities, should consider that the innovativeness level of a new product is dependent upon certain factors in the external environment (i.e., uncertainty and heterogeneity) as well as in the internal environment, such as the entrepreneurial style they adopt, the technology policy they follow, the learning climate, the orientation towards customers, the level of inter-functional coordination and the synergies they achieve in terms of marketing and technology. In addition, firm size and age play also an important role. The knowledge of understanding the underlying driving forces behind PI could help top managers to focus their efforts on specific areas, which may allow a better match between their firms' environment (external and internal) and product-related innovative performance.

In addition, the evidence supports industry- and firm-specific factors that facilitate the introduction of more innovative and profitable products. Useful conclusions can be derived regarding factors that relate to higher PI for firms of high profitability. From an overall view of the more profitable firms, it is suggested that building an internal environment featured by a stronger entrepreneurial orientation (risk-taking and proactiveness) leverages the adoption of more innovative products. On the contrary, firms could be advised to rely less on the adoption of technology (i.e., purchase of equipment), as indicated by the less profitable firms, which are mainly characterised by a more aggressive technology policy to achieve higher PI.

Overall, the empirical evidence reported here, could be used nationwide by policy-makers to design support programmes and initiatives of innovation for SMEs that widen key concepts, such

as entrepreneurship, learning and market orientation, beyond the notions of R&D and Hi-tech. Mechanisms that equip more and more Greek SMEs to become more entrepreneurial-, learning- and market-oriented along with relevant training on enhancing innovativeness in new product offerings could be set up.

This doctoral study reports on an attempt to identify some underlying driving forces behind different aspects of the key concept of PI. Any conclusion drawn from this study should, however, be regarded as tentative due to limitations. This study was applied to a limited context, drawing upon data collected from manufacturing SMEs in Greece making the ability of drawing generalisable conclusions of the findings limited. However, the empirical evidence as regards PI determinants does increase our understanding in national contexts other than those of large countries (such as United States, Canada, Australia), and helps to demonstrate the global importance of these concepts.

Finally, the results obtained in this study are indicative of the potential of similar analyses in explaining PI and reveal interesting avenues for further confirmation in the under-researched area of SMEs. It would thus be useful to verify whether similar relations pertain to SMEs of other sectors and/or national contexts. This would advance existing knowledge in both conceptual and empirical grounds.

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