

Strategic decision-making processes as a mediator of the effect of board characteristics on company innovation: A study of publicly-listed firms in Greece

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Abstract

Based on the Upper Echelons Theory that suggests the demographic characteristics of executives are linked to organisational processes and outcomes, the paper proposes that strategic decision-making processes mediate the relationship between board members' demographic characteristics and corporate innovation relating to product, process and organization. Based on questionnaires completed by 101 CEOs of Greek listed firms, the findings confirm that reporting and formalization as decision processes mediate the effect of board characteristics on innovation. Sound financial and formal mechanisms encourage Greek executives to take risks and invest in product or service innovation. Findings show that the executives' educational level is positively associated with financial reporting and rule formalization activities due to the changes that have been occurred in the Greek education system over recent decades. Functional background is found to influence only financial reporting activities. Finally, the managerial implications of this study are discussed.

Keywords: Upper Echelons Theory, strategic decision-making processes, innovation, board characteristics, Greek listed firms

1. Introduction

Academic interest in how executives influence strategic decisions and organizational outcomes has always been high in strategic management literature. Previous studies have portrayed the upper echelons' characteristics as determinants of strategic choices and their outcomes on organizational performance (Hambrick, Cho and Chen, 1996; Hambrick and Mason, 1984; Smith et al., 1994). Based on the Upper Echelon Theory, the executives' background and experiences have also been examined for their specific effects on strategic decisions, namely content (e.g. Bantel and Jackson, 1989; Damanpour and Schneider, 2006) and context (e.g. Bantel, 1993; Papadakis and Barwise, 2002). Content decisions refer to decisions that executives make either to select a core business that offers a competitive advantage or to exploit new opportunities in the market place (Hitt and Tyler, 1991). Content decisions are associated with portfolio management activities, diversification, mergers and acquisitions and innovation strategies. However, context decisions are described as a process during which executives determine appropriate actions and directions for the firm (Elbanna, 2006).

Building on the fact that, firstly, strategic decision-making processes remain something of a '*black box*' within the innovation literature and, secondly, limited research that has been carried out on the mediating effect between executives' characteristics and strategic outcomes (Hambrick, 2007), this study empirically investigates whether the strategic decision-making processes of financial reporting and rule formalization influence the relationship between the executives' demographic characteristics and innovation. It provides academics and business practitioners with a clear understanding of the specific strategic decision-making processes that mediate the relationship between executives' attributes and innovation strategies.

The study contributes to the existing literature and research on strategic management in several novel ways. Firstly, it proposes an integrative framework of potential strategic determinants of innovation, incorporating decision-making processes and managerial characteristics. This is the first study to the best of our knowledge that theoretically and empirically examines strategic decision-making processes as a mediator between executives' characteristics and firms' innovation. Secondly, although previous studies in the field (Kimberly and Evanisko, 1981) have conceived innovation adoption either as a multi-phase process or as an outcome of dichotomous decision, in this study, the construct of innovation captures product, process and organizational innovation strategies. Finally, based on a sample of 101 questionnaires completed by Greek CEOs, the study aims to identify the key influences on innovation in Greek companies as a contribution to addressing Greece's relatively low levels of innovation.

2. Research Background

2.1. Upper Echelons Theory

Upper Echelons Theory was developed by Hambrick and Mason (1984) and has its roots in the behaviour theory of the firm (March and Simon, 1958). According to the latter, decision makers make economically rational decisions because they are bounded by rationality and must act in a social context of multiple and conflicting goals. Hambrick and Mason (1984) formalized the upper echelons perspective, "*proposing that senior executives make strategic choices on the basis on their cognitions and values and that the organization becomes a reflection of its top managers*" (Finkelstein and Hambrick, 1996, p. 6). Upper Echelons Theory links observable demographic characteristics of the executives to organizational process and outcomes (Finkelstein and Hambrick, 1996; Hambrick and Mason, 1984). The demographic characteristics of tenure, functional experience, formal education and international experience have been showed to impact strategic choices (Finkelstein, Hambrick and Cannella, 2008).

2.2. Strategic choice of Innovation

Innovation is regarded as the basis of competitive advantage and economic growth due to increasing global competition and technological change (Porter and Ketels, 2003). Executives perceive innovation as a vital mechanism to accelerate change in today's global environment and to achieve organizational growth. Innovation is therefore perceived as a way of changing an organization via internal or external environmental forces (Damanpour, 1991). In this study, we focus on innovation strategies relating to product, process and organization.

The strategic choice perspective has generated a large body of research examining the impact of executives' demographics on organizational outcomes (Gupta and Govindarajan, 1984). The empirical results of many scholars have demonstrated strong associations between the characteristics of the executives and strategy/performance (e.g. Gupta and Govindarajan, 1984; Hambrick and Mason, 1984; Miller and Toulouse, 1986) while corporate strategy can be viewed by a number of dimensions incorporating, *inter alia*, product differentiation or low cost (Porter, 1980), innovation or reliability (Miles and Snow, 1978), innovation timing or focus (Maidique and Patch, 1982). Howell and Higgins (1990) argue that personality traits influence the emergence of innovation champions in organizations. Other scholars (Bantel and Jackson, 1989; Kimberly and Evanisko, 1981) have concluded that the executives' educational background is associated with innovation. A number of attributes have been examined including

structure, managerial characteristics, available resources, administrative intensity, and internal/external communication (Damanpour, 1991) although no clear set of explanatory variables has emerged (Wolfe, 1994). The study sheds light on internal strategic decisions processes that encourage innovation practices at corporate level.

3. Hypotheses

Based on the Upper Echelon Theory, the purpose of this study is to examine the mediating role of strategic decisions on the relationship between executives' demographics and innovation. Figure 1 presents a conceptual model that examines first the direct effect of executives' demographic characteristics on strategic decision-making process, namely financial reporting and rule formalization and then the effects of strategic decision-making processes on innovation. Finally, it suggests, and statistically tests, the mediating effects of strategic decision processes on demographic characteristics-innovation relationships.

3.1. Directors' Characteristics and Strategic Decision-making Processes

Previous research has found that the executives' characteristics influence the strategic decision-making processes (Goll and Rasheed, 2005; Papadakis and Barwise, 1997). In this study, we examine the effects of two demographic characteristics; educational level and functional background on strategic decision-making processes of financial reporting and rule formalization.

Educational level is viewed as an indicator of executives' knowledge, cognitive orientation and analytical skills (Dollinger, 1984; Hambrick and Mason, 1984). Well educated CEOs are more likely to demand detailed information and extensive financial reporting (Bantel, 1993). In a sample of Greek manufacturing firms, Papadakis et al., (1998) found that education level to be positively associated with financial reporting. The empirical findings of Papadakis and Barwise (2002) indicate that CEO characteristics (education) as well as the characteristics of the top management team (education and competitive aggressiveness) are related to the degree of hierarchical decentralization. In a similar study (Goll and Rasheed, 2005) a significant and positive relationship was found between educational level and rational decision-making. The following hypothesis can be presented based on these assertions:

***Hypothesis 1:** The higher the educational level of executives, the more likely they pursue financial reporting and rule formalization in strategic decision-making processes.*

Functional background represents an important aspect of an individual's experience base and, as a result, a key indicator of the type of skills and cognition that the executive brings to his/her job (Rajagopalan and Datta, 1996). Hambrick and Mason (1984) have distinguished functional background into two broad categories - the 'output' functions and the 'throughput' functions. The 'output' functions include functional areas relating to marketing, sales, merchandising, product research and development (R&D). On the other hand, 'throughput' functions include areas of productions/operations, engineering, finance and accounting, which aim to increase efficiency in the transformation process. This classification provides a linkage between functional background and organizational decision-making. For instance, executives with backgrounds in R&D are associated with progress, invention and improvement (Wiersema and Bantel, 1992). On the other hand, 'throughput' backgrounds are important in industries that are characterized by high capital intensity or concentration and lower growth (Rajagopalan and Datta, 1996). Previous

studies have focused on the influence of functional management background on content strategic decisions but with mixed results. This study attempts to investigate the effect of managerial functional background on the strategic decision-making process. Therefore, we put forward the following hypothesis:

Hypothesis 2: Executives' functional management background is positively associated with the strategic decision-making processes of financial reporting and rule formalization.

3.2. Effects of Strategic Decision-making Processes on Innovation

Based on the strategic choice perspective, the executives' attributes influence a series of strategic choices at corporate level (Hambrick and Mason, 1984; Miller and Toulouse, 1986). Dean and Sharfman (1996, pp. 379-380) have described strategic decisions as, "committing substantial resources, setting precedents, and creating waves of lesser decisions (Mintzberg et al. 1976) as ill-structured, non-routine and complex (Schwenk, 1988); and as substantial, unusual and all pervading". Various scholars refer to decision-making as a sequence of phases (e.g. Fredrickson, 1984; Mintzberg et al., 1976) or as a set of different characteristics/dimensions (e.g. Dean and Sharfman, 1996; Hickson et. al., 1986; Wally and Baum, 1997) and subsequently discuss the effects of these dimensions on organizational outcomes (e.g. Dean and Sharfman, 1996). Among the dimensions noted are comprehensiveness/rationality, politicization, centralization and formalization (Dean and Sharfman, 1996; Rajagopalan et al., 1993). Due to the lack of knowledge on the specific strategic decision-making characteristics that influence strategic outcomes, the section below will examine the effects of two under researched strategic decision-making processes namely financial reporting and rule formalization on the strategic outcome of innovation.

Financial reporting is regarded as a dimension of rationality of strategic decisions that describes the investment nature of the firm. Sound financial reporting activities permit various stakeholders to analyze the financial state of the company (Papadakis et al, 1998). Miller and Friesen (1978) have stressed out the need for appropriate resource allocations to promote innovation. Due to the high cost of innovation activities, firms with detailed financial reporting activities and budgets for resource allocation are more likely to pursue innovation strategies. Earlier we proposed that executives' characteristics are positively related to financial reporting activities (Hypotheses 1 and 2), and drawing from the existing literature, financial reporting activities are positively related to firm' innovation. The following hypothesis can thus put forward based on previous ideas:

Hypothesis 3: Financial reporting activities are positively related to firm's innovation.

Formalization describes the existence of a set of formalised rules guiding the process as well as formal co-ordination devices. Formalization refers to the degree that organizational policies, job descriptions and objective-setting plans are articulated explicitly mainly through written communications (Wally and Baum, 1994). In highly formalized organizations, extensive rules define precisely the responsibilities and roles of each executive. On the opposite, in non-formalised organizations the executive has the flexibility to adjust his responsibilities according to circumstances. Rule formalization strategies vary in the cultural context in which firms are operating. For instance rule formalization strategies in Mediterranean countries such as Greece and Cyprus are different compared to those of Anglo-Saxon countries (U.K, U.S) (Dimitratos et al., 2010). Formalization leads to administrative efficiency and it helps organizations to adopt innovation strategies. Khandwalla (1995) found a significant correlation between high formalization and implementation of innovations in the bureaucratic organizations in

India. Low degree of formalization permits openness and encourages new ideas and behavior. The above argument indicates that formalization in organizational policies and procedures inhibits the adoption of innovation (Pierce and Delbecq, 1977). Since, it is not clear to what extent formal rules and procedures affect the degree of innovation, we propose the following hypothesis:

***Hypothesis 4:** Formalization in the strategic decision-making process is positively related to firm's innovation.*

3.3. Mediating Role of Strategic Decision-making Process

Strategic decisions are derived from the reflections and attributes of the executives and play a crucial role in strategic outcomes. Based on previous research in the field of strategic management, executives' attributes have a significant influence not only on various strategic decision-making processes (Goll and Rasheed, 2005; Hambrick and Mason, 1984) but also on the strategic outcomes of innovation (Miller and Toulouse, 1986). Following the Upper Echelons Theory, we argue that the demographic characteristics of the executives bring cognitive base and values to the strategic decision-making process and strategic outcomes. Building on previous theoretical and empirical evidence, we propose a mediation model where the executives' characteristics affect how the strategic decision-making processes are pursued and how firms' innovate. Specifically, we expect that the strategic decision-making processes of financial reporting and rule formalization to mediate the relationship between executives' characteristics and firm's innovation. Thus, we theorize that:

***Hypothesis 5:** Strategic decision making processes of financial reporting and rule formalization mediate the effects of executives' characteristics on innovation.*

With these five hypotheses articulated, we can now describe the context to which they will be applied and the methods used for testing them.

4. Research Context and Methods

4.1 Cultural Context

Greece is a developed country which, since joining the European Union in 1981, has experienced remarkable and sustained economic growth until very recently. Investments in industrial enterprises, funds from the European Union and growing revenues from tourism, shipping and a fast growing service sector, have all contributed to increased standards of living. The majority of Greek firms are small and family owned with limited R&D and market spending due to their size. Low R&D expenditure pushes Greek firms towards low value added products and services where competition is fiercer and profit margins smaller and where, due to low wages, developing countries have a considerable advantage. Moreover, Greece experiences high levels of government regulation, huge bureaucratic obstacles, uncooperative labour unions and a labour force with high expectations. These circumstances deter Greek companies from taking strategic actions and provide them with challenges that are different to those of developed or under-developed countries (Makridakis et al., 1997).

The majority of Greek firms are characterized by lack of financial and technological resources, weak technological infrastructure (such as legislation, intellectual property rights and supply of designers), outdated educational and production methods, and limited use of modern management tools and systems (Bourantas et al., 1990; Bourantas and Papadakis, 1996; Makridakis et al., 1997; Tsipouri, 1991). Hofstede (1980) found Greece to be a society characterized by high degree of uncertainty and risk. High

uncertainty avoidance can be an obstacle of technological innovation, in so much that high inherent financial risk can lead to conservative strategy.

Innovation activity in Greece is below the average of the European Union. In particular its ranking in R&D expenditure and its capacity to innovate are especially low. R&D and marketing departments, as well as public support, are not regarded as key sources of innovative ideas in Greece (General Secretariat of Research and Technology, 1996). International transfer of technology, in the form of foreign direct investment as well as the import of capital goods, is still the main source of technological inputs into the Greek system (Giannitsis and Mavri, 1993). The unbalanced technological infrastructure and high income taxes discourage wealth accumulation and entrepreneurship (Tsipouri, 1991). Total business expenditure on innovation is high more so in terms of 'new-to-the-company' products than in 'new to the market' products. In an effort to improve the innovation performance of Greek companies, a model of open innovation has been suggested, emphasizes the adoption and adaptation of proven technologies through small, incremental innovations, applications in new contexts, adaptation to consumer needs and on improved internal organizational processes (Lioukas, 2009).

4.2. Sample and Data Collection

The initial sample consisted of all firms listed on the Athens Stock Exchange. Those companies that had been recently de-listed are excluded and so the remaining sample frame consists of 270 firms. The contact details of those firms have been drawn from the ICAP Greek Financial Directory database. The structured questionnaire was addressed to the CEO as he/she is the most knowledge person that can answer questions related to corporate level strategic decisions. A questionnaire, to which CEO 101 of the 270 firms responded, serves as the primary source of data. The questionnaire, designed in accordance with the 'Total Design Method' of Dillman (1978), was originally developed in English and, on the recommendation of Brislin (1980), was translated through a back translation process by an independent translator into Greek.

The questionnaire was then pilot tested through in-depth interviews by academics and board members of Greek organizations in order to ensure question efficacy and format completeness while also confirming that its tools were appropriate, reliable and relevant to the Greek cultural context before the launch of the survey. The first wave of questionnaires was sent to the CEOs of the 270 Greek firms and a second wave of questionnaires was sent to them three weeks later. Follow-up phone calls and email reminders were pursued in between the two mailings. Finally, we received 101 eligible questionnaires for analysis.

4.3. Measurement, Reliability and Validity of Scales

The questionnaire was constructed according to previously validated scales obtained from the review of the literature which have been slightly adjusted to the cultural context of the study. Reliability and internal consistency for each scale was determined by using the Cronbach's alpha (Nunnally, 1978). Kline (1999) notes that the acceptable value for Cronbach's alpha is between 0.7 and 0.9. All scales are found to satisfy this reliability criterion with Cronbach's alpha coefficients ranging from 0.840 to 0.954 as illustrated in Table 1. Construct validity was assessed using factor analysis (Deshpande, 1982). Principal component factor analysis with varimax orthogonal rotation was employed to produce factor solutions and to assess construct validity. The results of this analysis was the development of three factors; financial reporting, rule formalization and innovation with eigenvalue greater than one, details of which are summarized in Table 1. All the

measures 'loaded' cleanly on separate factors, with all the factors loadings above 0.70, a high threshold for acceptance (Nunnally, 1978). The construct of *innovation* as a dependent variable in this study (Cronbach's alpha, $\alpha = .954$) was captured by using 12 items developed by Huse (1994) who divided innovation into three categories: product innovation (4 items), process innovation (5 items) and organizational innovation (3 items) based on the methodology which has been initially developed by Zahra (1996).

The independent variables are the executives' educational level and functional background. *Educational level* of executives has been measured by using a two-level scale - for bachelor's degree (1 = for those who hold a BSc degree and 0= for those who have only higher educational degree) and for master's degree (1 = for those who hold a MSc degree and 0=for those who have a higher educational degree).

Executives' functional management background is classified based on the following seven categories: finance treasurer, general management, information systems, marketing/sales/customer services, accounting/controller, manufacturing and sales and engineering. In this study, the majority of the respondents were from accounting (coded as '1') and general management (coded as '2').

The mediator construct of strategic decision-making process in this study has been operationalised by the following two constructs: *financial reporting* and *rule formalization*. The *financial reporting activities* ($\alpha = .840$) comprise five items: 1. Use of NPV-IRR methods, 2. Use of net present value as capital budgeting method, 3. Inclusion of pro forma financial statements, 4. Detailed cost studies, 5. Incorporation of the strategic decision into company-wide financial plans (Papadakis et al., 1998). The following items are used to measure *rule formalization* ($\alpha = .923$) of the strategic-decision process: - written procedures guiding the process; formal procedures to identify alternative ways of action; formal screening procedures; formal documents guiding the final decision; and predetermined criteria for strategic decision evaluation (Papadakis et al., 1998).

5. Findings and Discussion

Table 2 reports descriptive statistics and correlation coefficients between the variables of this study. Correlation analysis, as shown in Table 2, gives us an insight into the relationships between constructs. Most of the correlations between demographic characteristics of board members, strategic decision-making processes (financial reporting and rule formalization) and innovation are statistically significant at $p < 0.05$ and $p < 0.01$ and in the expected directions.

The hypotheses that we have put forward were tested using regression analysis. Prior to the regression analysis, we checked for multi-collinearity among predictors by executing a correlation matrix of all predictors and identified that they were not highly correlated. The variance inflation factors (VIFs) associated with each regression coefficient were considerably below the recommended cut off of 10 and VIF values were not considerably larger than 1 suggesting no collinearity problems (Neter, Wasserman and Kutner, 1990).

Model 1a in Table 3 shows that the executives' educational level is a significant predictor of financial reporting. In Model 1a the educational level (BSc) ($\beta = .417$, $t = 2.507$, $p \geq 0.01$) and the educational level (MSc) ($\beta = .458$, $t = 2.744$, $p \leq 0.01$) are positively correlated with the strategic decision-making process of financial reporting. Therefore, H1 is supported.

However, Model 1b partially confirms Hypothesis 2, which predicted that only educational level (BSc) has a direct positive effect ($\beta = .355, t = 2.291, p \leq 0.05$) on rule formalization activities in decision-making processes. The findings appear to support the theoretical assumptions by scholars like Papadakis et al., 1998, in that education level is positively associated with financial reporting. Educated CEOs are more likely to demand detailed information and extensive financial reporting (Bantel, 1993) which suggests that education might also be associated with more co-ordination activity and more participation in the strategic decision-making process. The fact that the educational level of Greek executives influences the strategic decision-making process might be explained by the dramatic changes that have been occurred in the Greek education system over recent decades. The majority of Greek CEOs today have received formal graduate and postgraduate education in Greece or abroad (Bourantas and Papadakis, 1996). On the other hand, the functional management background of executives seems to play a less significant role in strategic decision-making processes.

Model 2 in Table 3 shows that the strategic decision making processes of financial reporting ($\beta = .299, t = 2.565, p \leq 0.01$) as well as of rule formalization ($\beta = .364, t = 3.181, p \leq 0.01$) are significant determinants of firm's innovation. This suggests that the existence of sound financial activities facilitate innovation in Greek firms by encouraging decision-makers to take risks and invest in product or service innovation. In addition, this finding is essentially in agreement with those of other scholars (e.g. Damanpour, 1991; Nohria and Gulati, 1996) who have found that financial reporting activities have been positively related to innovation. As it is illustrated in Model 2, rule formalization appears to be strongly associated with organizational innovation. Our results indicate that innovation in Greek publicly listed companies require formal mechanisms, specific rules and procedures, a finding that is in line with the conclusions of Borins (1998) who suggests that partnerships in innovations require formal mechanisms. The results have provided evidence to support Hypotheses 3 and 4.

To test hypothesis 5, we estimated two alternative models suggested by Baron and Kenny (1986). In Model 3, the constructs of the strategic decision-making processes namely financial reporting and rule formalization were removed and only the direct effects of Boards of Directors' demographic characteristics on innovation were estimated. The results indicate an effect of the demographic characteristics' on innovation.

In model 4, the dependent variable was regressed onto both the independent variables and the mediators together. The direct effect of board demographic characteristics on innovation, as indicated in model 3, are diminished with the indirect effects of these characteristics upon strategic decision-making processes, as identified in model 4. This condition provides evidence for "*perfect mediation*" between boards of directors' demographic characteristics and firm's innovation through internal strategic decision-making processes. Hence, we conclude that the effects of demographic characteristics are fully mediated by strategic decision-making processes of financial reporting and rule formalization, supportive of H5.

6. Conclusions

This study investigated the effects of board members' characteristics (educational level and functional background) on firms' strategic decision-making processes and ultimately on firms' innovation. Based on the Upper Echelons Theory and the strategic choice perspective several hypotheses have been developed and were examined in a sample of Greek listed firms that allow us to open the 'black box' and develop a new understanding of the factors that facilitate the adoption and implementation of strategic innovation choices which contributes to the strategic management literature.

One key contribution is that this study provides innovative insights the effects of managerial characteristics directly on context decisions (strategic decision-making processes of financial reporting and rule formalization) and indirectly on content decisions (innovation). The CEOs' level of education up to bachelor's degree was found to be associated with both financial reporting and rule formalization. The effects of these demographic characteristics have been diminished when we added the mediator in the model and regressed all of them against innovation. When all the variables were regressed against innovation, it is found that functional background of general management is related to innovation, indicating that CEOs with expertise in the management field have been proactive in pursuing innovation strategies.

The main contribution of the study is that we enhance the strategic management research and Upper Echelons Theory with new empirical evidence that the strategic decision-making process variables of financial reporting and rule formalization act as mediators between boards of directors' characteristics and firms' innovation. The study confirms the mediating effect of strategic decision-making processes on innovation and, to a lesser extent, the effect of managerial characteristics on innovation.

The findings have also provided us with strong evidence that the internal strategic decision-making processes adopted by Greek listed firms are the key determinants of innovation. The majority of Greek companies have previously lacked strong financial and technological resources and have been characterized by autocratic methods, 'passivity' in marketing, and limited use of modern management tools to support strategic decisions (Bourantas and Papadakis, 1996; Makridakis et al., 1997). However, the situation in Greece changed dramatically after its integration into the European Union. This new institutional environment exerted strong pressures towards modernization and the improvement of competitiveness on both macro and microeconomics fronts (Kazakos, 2001), so Greek organizations have tended to adopt various innovative strategies in order to compete with more advanced economies and to play an increasing decision-making role in the economies of neighboring Balkan countries.

6.1. Managerial Relevance

Our study on strategic decision-making processes offers important implications for practitioners. First, the results contribute to the leadership context, as they have shown that the educational level of Greek CEOs has an effect on financial reporting and rule formalization. While, other results have demonstrated that the CEOs' functional background and expertise does not affect any strategic decision-making process. The findings do show that Greek executives with certain demographic characteristics are more likely to pursue innovation strategies within their firms. For instance, board members with bachelor/masters' degrees support innovation practices more strongly and board members with general management functional background tend to be more innovative than those with expertise in accounting. The fact that the demographic characteristics of CEOs do not predominately affect strategic decisions indicate that the corporate level decisions are not taken by single individual but by all the board members who are coming

from diverse functional backgrounds and are equally involved in the strategic decision-making processes.

Secondly, the results indicate that formalised decision-making, accompanied by sound financial reporting activities, encourage innovation. To achieve financial prosperity, Greek companies are increasingly adopting a more flexible management style that is more akin to a team-based style of decision-making. Also there are various external forces, such as technological dynamics, EU obligations, and the economic expansion of Balkan countries that lead Greek firms to adopt more Western-type or professional styles of management. Greek boards of directors are requested to develop a more formal yet flexible decision-making process in order to introduce innovation strategies that are appropriate to their company's situation. The importance of the significant relationship between the internal strategic decisions of financial reporting and rule formalization suggests that CEOs must foster innovative strategies by adopting specific decision-making processes. Thirdly, the existence of specific financial reporting activities and more formalized decision-making processes have encouraged the adoption of innovation strategies. The formal financial activities and rule formalizations have enhanced the confidence of stakeholders to invest in their organisations.

6.2 *Limitations and Future Research Directions*

Our study has several limitations that should be addressed in further research. Firstly, while we have provided evidence of the mediating role of strategic decision-making processes between the Greek executives' demographic characteristics and innovation, we cannot assume that those demographic characteristics are exhaustive predictors of innovation strategies. There are still other personality or composition characteristics such as board size, leadership structure, interlocking directors, need for achievement, locus of control, risk attitude and tolerance for ambiguity that have not been incorporated in the theoretical model. Secondly, the study examined the mediating effect of the strategic decision-making process between board of directors' characteristics and the outcome of innovation. The construct of *innovation* captures several innovation elements including product, process and organizational innovation but it does not capture the different innovation adoption phases.

Thirdly, the study is explanatory, cross-sectional and self reporting in nature. Therefore, the findings are limited to the relationships of associations. A longitudinal study could help us to deal with the problem of endogeneity and reverse causality. Also, a single respondent for each firm has completed the questionnaire. This was due to the fact that it was difficult to obtain responses from all or most of board members due to their time constraint but also due to the sensitive nature of the data. In future research, the multiple respondents per firm would be highly recommended in order to minimize the effects of systematic response bias. Finally, the sample of our study consists only of publicly listed organizations from various industries, a fact that does not allow us to make generalisations at the industry level. Also, the data are limited to companies of one country. Further research of a longitudinal nature will give us useful insights to either support or refute these relationships.

Based on the current findings, we would like to point out some avenues for future research. First, our findings might encourage the continuation of theoretical and empirical research on strategic management and innovation. Future empirical research might include a different set of characteristics. Second, future studies could also examine the

effect of environment on innovation, perhaps its moderating role on innovation. Apart from the strategic choice perspective, it will be interesting to apply economic, social and psychological theories in an effort to examine innovation from a contingency perspective. Third, the findings of the study are based on cross-sectional data; a next logical step in this line of research would be to investigate the relationship between innovation and performance outcomes over a period of time, treating contextual variables as potential moderators. A more accurate approach to understand the causal relationships between decision antecedents and process requires the adoption of longitudinal research design. Future research using qualitative and longitudinal methods (Kesner and Sebra, 1994) would be useful in examining the validity of our findings. Finally, studies on Boards of Directors have so far taken place predominantly in western and developed economies such as United States and the U.K, so future research might generate additional insights in cultural settings where Boards of Directors and innovation strategies are in their infancy. This will open up a promising research avenue on comparative decision-making practices across different cultural or national settings.

References

- Bantel, K. and Jackson, S. (1989). Top management and innovations in banking: Does the composition of the top management team make a difference?. *Strategic Management Journal*, 10, pp. 107-124.
- Bantel, K. (1993). Top team, environment and performance effects on strategic planning formality. *Group and Organization Management*, 18(4), pp. 436-458.
- Baron, R. and Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, 51, pp. 1173-1182.
- Borins, S. (1998). *Innovating with Integrity: How Local Heroes are Transforming American Government*, Washington, DC.: Georgetown University Press.
- Bourantas, D. and Papadakis, V. (1996). Greek management: Diagnosis and prognosis. *International Studies of Management and Organization*, 26 (3), pp. 13-32.
- Bourantas, D., Anagnostelis, J., Mantes, Y. and Kefalas, A. (1990). Culture gap in Greek management. *Organization Studies*. 11 (2), pp. 261-83.
- Brislin, R. (1980). Translation and content analysis of oral and written materials, in: Triandis, H., Berry, J., (Eds.), *Handbook of Cross-Cultural Psychology* (pp. 389 – 444). Boston: Allyn and Bacon.
- Damanpour, F. and Schneider, M. (2006). Phases of adoption of innovation in organizations: Effects of environment, organization and top managers. *British Journal of Management*, 17 (3), pp. 215-236.
- Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal*, 34 (3), pp. 555-90.
- Dean, J. and Sharfman, M. (1996). Does decision process matter? A study of strategic decision-making effectiveness. *Academy of Management Journal*, 39(2), pp. 369-396.
- Deshpande, R. (1982). The organizational context of market research use. *Journal of Marketing*, 46(4), pp. 91-101.
- Dillman, D. (1978). *Mail and Telephone Survey, The Total Design Method*. New York: Wiley-Interscience.
- Dimitratos, P., Petrou, A., Plakoyiannaki, E. and Johnson, J. (2010). Strategic decision-making processes in internationalization: Does national culture of the focal firm matter?, *Journal of World Business*, 46(2), pp. 194-204.

- Dollinger, M. (1984). Environmental boundary spanning and information processing effects on organizational performance. *Academy of Management Journal*, 27(2), pp. 351- 68.
- Elbanna, S. (2006). Strategic decision-making: process perspectives. *International Journal of Management Review*, 8(1), pp. 1-20.
- Finkelstein, S. and Hambrick, D.C. (1996). *Strategic leadership: Top executive and their effects on organizations*, Minneapolis/St.Paul: West
- Finkelstein, S., Hambrick, D.C., and Canella, A.J. (2008). *Strategic leadership: Theory and research on executives, top management and boards*. Oxford: Oxford University Press.
- Fredrickson, J. (1984). The comprehensiveness of strategic decision processes: extension, observations, future directions. *Academy of Management Journal*, 28(4), pp. 821-843.
- General Secretariat of Research and Technology (1996). *Study of Innovation of the Greek Firms* (in Greek). Athens.
- Giannitsis, T. and Mavri, D.(1993). *Technology Structures and Technology Transfer in the Greek Industry* (in Greek). Athens: Gutenberg.
- Goll, I. and Rasheed, A. (2005). The relationship between top management demographic characteristics, rational decision making, environmental munificence and firm performance. *Organization Studies*, 26 (7), pp. 999-1023.
- Govindarajan, V. (1989). Implementing competitive strategies at the business unit level: Implications of matching managers to strategies. *Strategic Management Journal*, 10(3), pp. 251-169.
- Gupta, A. and Govindarajan, V. (1984). Business unit strategy, managerial characteristics, and business, and business unit effectiveness at strategy implementation. *Academy of Management Journal*, 27 (1), pp. 25-41.
- Hambrick, D. and Mason, P. (1984). The organization as a reflection of its top managers. *Academy of Management Review*, 9 (2), pp. 193-206.
- Hambrick, D. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32, pp. 334-343.
- Hambrick, D.C., Cho, T.S. and Chen, M. (1996). The influence of top management team heterogeneity on firm's competitive moves. *Administrative Science Quarterly*, 41(4), pp. 659-684.
- Hickson, D., Butler, R., Cray, D., Mallory, G. and Wilson, D. (1986). *Top Decisions: Strategic Decision Making*. Oxford: Blackwell.
- Hitt, M. and Tyler, B. (1991). Strategic decision models: Integrating different perspectives. *Strategic Management Journal*, 12 (5), pp. 327-351.
- Hitt, M., Ireland, R. and Palia, K. (1982). Industrial firms' grand strategy and functional importance: Moderating effects on technology and uncertainty. *Academy of Management Journal*, 25(2), pp. 265-298.
- Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values*, Beverly Hills, CA: Sage.
- Howell, J. and Higgins, C., (1990). Champions of technological innovation. *Administrative Science Quarterly*, 35(2), pp. 317-341.
- Huse, M. (1994). *Innovation in the Norwegian Industry*, NF-report no 19/94.
- Kazakos, P. (2001). *Between State and Market: Economy and Economic Policy in Post War Greece, 1944–2000*, Patakis, Athens.
- Kesner, I. and Sebor, T. (1994). Executive succession: Past, present and future. *Journal of Management*, 20 (2), pp. 327-72.
- Khandwalla P. (1995). *Management Styles*. New Delhi: Tata-McGraw Hill.

- Kimberly, J. and Evanisko, M. (1981). Organizational innovation: The influence of individual, organizational and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal*, 24 (4), pp. 689-713.
- Kline, P. (1999). *The Handbook of Psychological Testing*, 2nd Ed. London: Routledge.
- Lioukas, S. (2009). *Innovation in Greece Comparative Evaluation with International Indicators, Policies, Strategy Recommendations*, Athens: Kokkalis Foundation.
- Maidique, M. and Patch, P. (1982). Corporate strategy and technological policy, in: Tushman, M., Morre, W. (Eds), *Readings in the Management of Innovation* (pp. 273-285). Marshfield, Mass: Pitman.
- Makridakis, S., Caloghirou, Y., Papagiannakis, L. and Trivellas, P. (1997). The dualism of Greek firms and management: Present state and future implications. *European Management Journal*, 15 (4), pp. 381-402.
- March, J.G. and Simon, H. (1958). *Organizations*. New York: Wiley.
- Miles R. and Snow C. (1978). *Organizational strategy, structure and process*. New York: McGraw-Hill.
- Miller, D. and Friesen, P. (1978). Archetypes of strategy formulation. *Management Science*, 2 (9), pp. 921-33.
- Miller, D. and Toulouse, J. (1986). Chief executive personality and corporate strategy and structure in small firms. *Management Science*, 32 (11), pp. 1389-1409.
- Mintzberg, H., Raisinghani, D. and Theoret, A. (1976). The structure of unstructured decision processes. *Administrative Science Quarterly*, 21 (2), pp. 246-275.
- Neter, J., Wasserman, W., and Kutner, M. (1996). *Applied linear statistical models* (4th ed). Homewood, IL: Irwin.
- Nohria, N. & Gulati, R. (1996). Is slack good or bad for innovation? *Academy of Management Journal*, 39, pp. 1245-1264.
- Nunnally, J.C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Papadakis, V. and Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision-making?. *British Journal of Management*, 13(1), pp. 83-95.
- Papadakis, V. and Barwise, P., (1997). What can we tell managers about making strategic decisions?, in: Papadakis, V. & Barwise, P., (Eds), *Strategic Decisions*. (pp. 267-87). London: Kluwer.
- Papadakis, V., Lioukas, S. and Chambers, D. (1998). Strategic decision-making processes: The Role of management and context. *Strategic Management Journal*, 19 (2), pp. 115-147.
- Pierce, J. and Delbecq, A. (1977). Organization structure, individual attitudes and innovation. *Academy of Management Review*, 2(1), pp. 27-37.
- Porter, M. E. (1980). *Competitive Strategy*. New York: Free Press.
- Porter, M. and Ketels, C. (2003). *UK Competitiveness: Moving to The Next Stage*. London: Department of Trade and Industry.
- Rajagopalan, N. and Datta, D. (1996). CEO characteristics: Does industry matter?. *Academy of Management Journal*, 39(1), pp. 197-215.
- Rajagopalan, N., Rasheed, A. and Datta, D.K. (1993). Strategic decision processes: Critical review and future directions. *Journal of Management*, 19(2), pp. 349-384.
- Schwenk, C. (1988). The cognitive perspective on strategic decision making. *Journal of Management Studies*, 25(1), pp. 41-55.
- Smith, K.G., Smith, K.A., Olian, J., Sims, H., O'Bannon, D. and Scully, J. (1994). Top management team demography and process: The Case of social integration and communication, *Administrative Science Quarterly*, 39(3), pp. 412-438.

- Tsipouri, L. (1991). The transfer of technology issue revisited: Some evidence from Greece. *Entrepreneurship and Regional Development*, 3, pp. 145-157.
- Tushman, M. and O'Reilly, M. (2002). *Winning through Innovation: A Practical Guide to Leading Organizational Change and Renewal*. Boston: Harvard Business School Press.
- Wally, S. and Baum, J. (1994). Personal and structural determinants of the pace of strategic decision-making. *Academy of Management Journal*, 37 (4), pp. 932-56.
- Wiersema, M. and Bantel, K. (1992). Top management team demography and corporate strategic change. *Academy of Management Journal*, 35(1), pp. 91-121.
- Wolfe, R. (1994). Organizational innovation: Review, critique and suggested research directions. *Journal of Management Studies*, 31 (3), pp. 405-31.
- Zahra, S.A. (1996). Governance ownership and corporate entrepreneurship: the moderating impact of industry technological opportunities, *Academy of Management Journal*, 39(6), pp. 1713-1735.

Appendices

Table 1: Measurement Items, Standard Loadings and Reliabilities

<i>Measures</i>	<i>Std. loadings</i>	<i>a</i>
Financial Reporting Indicators (FINREP)		.840
Use of Net Present Value as Capital Budgeting Method	.850	
Incorporation of Strategic Decision	.816	
Inclusion of Pro-Forma Financial Statements	.764	
Detailed Cost Studies	.745	
Use of Internal Rate of Return (IRR) as Capital Budgeting Method	.744	
Eigenvalue for FINREP	3.080	
% variance explained by FINREP	61.609	
Rule Formalization (RULEFORM)		.923
Formal Procedures to Identify Alternative Ways of Action	.920	
Written Procedures Guiding the Process	.871	
Formal Documents Guiding the Final Decision	.868	
Formal Screening Procedures	.861	
Predetermined Criteria for Strategic Decision Evaluation	.857	
Eigenvalue for RULEFORM	3.834	
% variance explained by RULEFORM	76.689	
Innovation (INNOV)		.954
Being the First Company in the Industry to Introduce Technological Improvements	.913	
Creating Innovative Technologies	.887	
Being the First Company in the Industry to Introduce New Technology	.879	
Creating New Products for Fast Market Introduction	.850	
Investing Heavily in Cutting Edge Process Technology-Oriented R&D	.822	
Creating New Variations to Existing Product Lines	.821	
Developing Radical New Technology	.820	
Being the First Company in the Industry to Introduce new Products/Services	.792	
Developing Systems that Encourage Initiatives and Creativity among Employees	.758	
Increasing the Revenue from less than 3 Years Old New Products	.752	
Supporting an Organizational Unit that Drive Innovation	.746	
Encouraging Innovation in the Organization	.738	
Eigenvalue for INNOV	8.009	
% variance explained by INNOV	66.740	

Variable	Mean	SD	1	2	3	4	5
1. Innovation	-.018	1.00					
2. Educational level(BSc)	0.34	0.47	.068				
3. Educational level(MSc)	0.47	0.50	.146	-.727**			
4. Functional background	0.64	0.48	.409**	-.036	.140		
5. Financial reporting	-.013	1.01	.600**	.129	.121	.272*	
6. Rule formalization	-.029	1.01	.621**	.214*	-.021	.201	.652**

n=101. * p<0.05 (two-tailed). **p<0.01(two-tailed).

Variables	Strategic decision-making process		Innovation		
	Model 1a Financial reporting	Model 1b Rule formalization	Model 2	Model 3 (mediator absent)	Model 4 (mediator added)
Educational level (BSc)	.417* (2.507)	.355* (2.291)		.249+ (1.604)	.135+ (.926)
Educational level (MSc)	.458* (2.744)	.255+ (1.446)		.246+ (1.578)	.143+ (.975)
Functional Background	.226+ (1.889)	.175+ (1.534)		.380** (3.216)	.210* (2.015)
Financial reporting			.329** (2.565)		.299* (2.018)
Rule formalization			.408** (3.181)		.364** (2.573)
R²	.189	.108	.462	.209	.564
Adjusted R²	.147	.069	.445	.168	.515
F	4.494	2.814	27.043	5.101	11.387
F Sig.	.007	.045	.000	.003	.000

n=101. Numbers are beta coefficients. Associated numbers in parentheses are t-ratios

+p<0.10, * p<0.05, **p<0.01

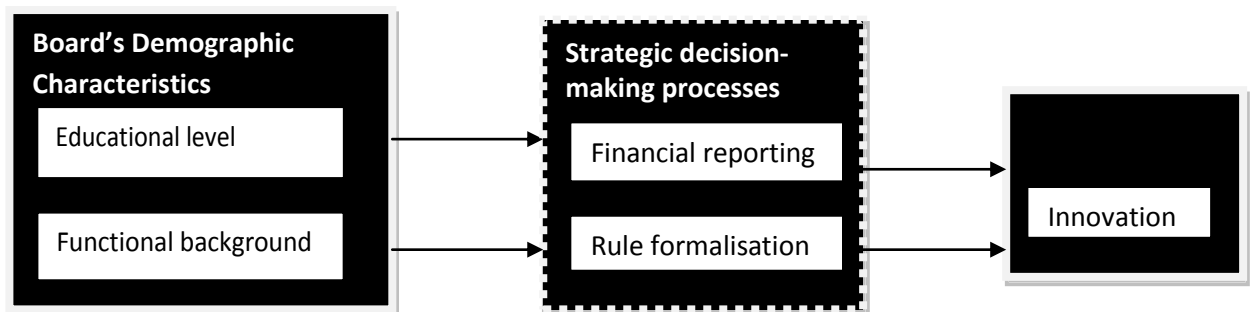


Figure 1. Conceptual Model