

**THE IMPACT OF BUSINESS ENVIRONMENT AND BOARDS OF DIRECTORS
ON STRATEGIC DECISION-MAKING: A CASE STUDY OF GREEK LISTED
COMPANIES**

A thesis submitted for the degree of Doctor of Philosophy

by

Maria Elisavet Balta

Brunel Business School, Brunel University

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ABSTRACT

This thesis documents a study of the factors associated with Boards of Directors' strategic decisions. The premise upon which such a research initiative is founded concerns the increased interest of academics and business practitioners in Board of Directors in the U.K and in U.S in part arising from recent financial scandals made in major public companies. Despite this increased attention to Board of Directors, it is acknowledged that Boards of Directors is one of the most under-researched management topics and its research is limited in scope and scale.

An extensive review of the literature revealed that a useful contribution to knowledge could be derived from the investigation of the factors that influence Boards' strategic decisions in quoted organisations. The research objectives is then to investigate the strategic decisions Boards of Directors and the organisation make by examining the environmental factors associated with the Board, the characteristics of the Board such as age, education, experience, composition, the Boards' strategic choices in areas such as innovation, strategic decisions and to examine the influence the Boards have on performance. Despite the significant research interest in this topic, knowledge is still incomplete.

This thesis makes a significant contribution to the strategic management literature by developing an integrative framework which examines strategic decisions from both content and process perspectives. The model developed, identifies the influence on strategic decisions, the environment, the characteristics of the Boards of Directors and its involvement has as influence on strategic decisions. The empirical study is carried out in a new cultural context; Greece and more specifically to listed firms on the Athens Stock Exchange.

A theoretical model has been created and following a deductive approach, primary data through questionnaires was collected from 105 Greek listed organisations. Data was analysed according to their descriptive properties and underlying correlation structure. Several principal components were derived from these analyses which were used in hypothesis testing. Subsequently, a multiple regression and GLM analyses were conducted in order to examine the interrelationships between the factors associated with Boards' strategic decisions. The research findings are discussed and considered in light of current knowledge in the area. A number of conclusions are made from the findings. Furthermore, implications for academics and business practitioners are drawn that indicate the relevance and applicability of this research to corporate governance practices. Limitations of the research and possible future research are set out.

The thesis is organised into seven chapters which are entitled in the following order: literature review of Boards of Directors and development of theoretical framework; empirical approach and conceptualisation of the factors associated with boards' strategic decisions; descriptive research findings; principal component analysis and construction of scale indices; multiple regression and GLM analyses; and, conclusions and implications of the study.

Table of Contents		Page
I	Acknowledgements	ii
II	Abstract	iii
III	Abbreviations	xii
CHAPTER 1 Context and Purpose of the Study		1
1.1	Introduction	1
1.2	Research Context	1
1.1.1	<i>Introduction</i>	1
1.1.2	<i>Strategic Management</i>	1
1.1.3	<i>Executive Leadership</i>	2
1.1.4	<i>Corporate Governance and Boards of Directors</i>	3
1.3	Focus and Significance of the Study	5
1.4	Research Aim and Objectives	7
1.5	Statement of Significance	8
1.6	Limitations of the Thesis	9
1.7	Structure of the Thesis and Order of Presentation	11
1.8	Concluding Remarks	12
CHAPTER 2 Theoretical Framework of the Study and a Review of Boards of Directors		13
2.1	Introduction	13
2.2	Corporate Governance	13
2.3	Corporate Governance in Greece	15
2.4	Definitions of Corporate Governance	21
2.5	Theories	22
2.5.1	<i>Agency Theory</i>	23
2.5.2	<i>Stewardship Theory</i>	24
2.5.3	<i>Recourse Dependency Theory</i>	26
2.5.4	<i>Stakeholder Theory</i>	27
2.5.5	<i>Institutional Theory</i>	28
2.5.6	<i>Managerial Hegemony Theory</i>	29
2.5.7	<i>Upper Echelons Theory</i>	29
2.5.8	<i>Structuration Theory</i>	30
2.5.9	<i>Overview of Corporate Governance Theories</i>	31
2.6	Boards of Directors and their Roles	32
2.6.1	<i>Linking Role and Resource Dependency Theory</i>	35
2.6.2	<i>Coordinating Role and Stakeholder Theory</i>	36
2.6.3	<i>Control Role and Agency Theory</i>	36
2.6.4	<i>Strategic Role and Stewardship Theory</i>	36
2.6.5	<i>Maintenance Role and Institutional Theory</i>	37
2.6.6	<i>Support Role and Managerial Hegemony</i>	37
2.7	Environmental Factors and Influences	38
2.7.1	<i>Introduction</i>	38
2.7.2	<i>Environmental Dimensions</i>	38
2.7.2.1	<i>Environmental Complexity</i>	40
2.7.2.2	<i>Environmental Munificence</i>	42
2.7.2.3	<i>Environmental Dynamism/Instability</i>	42
2.8	Boards of Directors	46
2.9	Board Structure	47
2.9.1	<i>Board Size</i>	47
2.9.2	<i>Board Composition</i>	49
2.9.3	<i>Executive versus Non-Executive Directors</i>	51
2.9.4	<i>Independent versus Affiliated Board of Directors</i>	52
2.9.5	<i>Interlocking Directors</i>	53
2.9.6	<i>Leadership Structure or CEO Duality</i>	54
2.10	Board Demographic Characteristics	56
2.10.1	<i>Age</i>	57
2.10.2	<i>Educational level</i>	57
2.10.3	<i>Functional Background</i>	58

2.10.4	<i>Executive Tenure</i>	59
2.10.4.1	<i>Industry Tenure</i>	59
2.10.4.2	<i>Organisational Tenure</i>	60
2.10.4.3	<i>Position Tenure</i>	61
2.10.4.4	<i>Female Representation</i>	62
2.11	Board Involvement in Strategic Decision-Making	63
2.11.1	<i>Insider versus Outsider Representation</i>	63
2.11.2	<i>Board Size and Board Involvement</i>	64
2.11.3	<i>Frequency of Board Meetings</i>	64
2.11.4	<i>Length of Board Meetings</i>	65
2.11.5	<i>Environmental Conditions</i>	65
2.12	Organisation Strategy	66
2.13	Models of Strategy	66
2.14	Strategic Decision Making Process	67
2.14.1	<i>The Environmental Determinism Perspective</i>	68
2.14.2	<i>Strategic or Management Choice Perspective</i>	69
2.15	Strategic Choices	72
2.16	Innovation	75
2.16.1	<i>Boards of Directors, External Environment and Firm's Innovation</i>	77
2.16.1.1	<i>Outside Directors</i>	77
2.16.1.2	<i>Age</i>	77
2.16.1.3	<i>Gender</i>	78
2.16.1.4	<i>Tenure</i>	78
2.16.1.5	<i>Educational Background</i>	79
2.16.1.6	<i>Environmental Dimensions</i>	79
2.17	Organisational Performance	80
2.18	Critical Observations from Literature Review	82
2.19	Integrative Framework of the Study	86
2.20	Research Hypotheses	92
2.21	Hypothesised Theoretical Framework	93
2.22	Cultural Context: Greece	97
2.22.1	<i>General Context</i>	97
2.22.2	<i>Cultural Context</i>	98
2.22.3	<i>The Management Culture of Greek Organisations</i>	99
2.23	Concluding Remarks	103
	CHAPTER 3 Research Design & Methodology	104
3.1	Introduction	104
3.2	Empirical Research Objectives	104
3.3	Research Approach	105
3.3.1	Research Methodology	105
3.3.2	Methodological Distinctions	106
3.3.3	Epistemological Approach	107
3.4	Research Design	113
3.5	Data Generation Sources & Communication Method	117
3.5.1	Introduction	117
3.5.2	Secondary Data	117
3.5.3	Primary Data	118
3.5.3.1	<i>Interviews</i>	118
3.5.3.2	<i>Protocol Research Approach</i>	119
3.5.3.3	<i>Postal Questionnaire</i>	119
3.5.3.4	<i>Online Surveys</i>	120
3.5.4	<i>Triangulation</i>	121
3.5.5	<i>Response Issue</i>	121
3.5.6	<i>Methodological Issues</i>	122
3.5.7	<i>Questionnaire Instrument Issue</i>	122
3.5.8	<i>Sampling Issues</i>	122

3.5.9	<i>Research Constraints</i>	124
3.6	Questionnaire Development Process	125
3.6.1	<i>Pilot Study</i>	126
3.6.2	<i>Ethical Consideration and Confidentiality</i>	129
3.7	Conceptualisation & Operationalisation of Variables	130
3.7.1	External Corporate Environment	130
3.7.2	Board Structure	132
3.7.3	Boards of Directors Demographic Characteristics	134
3.7.4	Involvement in the Strategic Decision Making	136
3.7.5	Strategic Decision Process Dimensions	138
3.7.6	Innovation	138
3.7.7	Organisational Characteristics	142
3.8	Methodology for Data Analysis	143
3.8.1	Introduction	143
3.8.2	Variables	143
3.8.3	Classification of Statistical Techniques	144
3.8.4.	Descriptive Statistics	144
3.8.5.	Correlation Analysis	144
3.8.6.	Factor Analysis	145
3.8.7.	Regression Analysis	145
3.8.8.	General Liner Model	146
3.9	Concluding Remarks	148
	CHAPTER 4 Descriptive Research Findings	149
4.1	Introduction	149
4.2	Measures of Company's Background: Descriptive Findings	149
4.3	Measures of Board Composition: Descriptive Findings	153
4.4	Measures of Demographic Characteristics of the Board: Descriptive Findings	159
4.5	Measures of External Corporate Environment: Descriptive Findings	163
4.6	Measures of Board Involvement in the Strategic Decision - Making Process: Descriptive Findings	165
4.7	Measures of Strategic Decision-Making Process: Descriptive Findings	169
4.7.1	<i>Measures of Comprehensiveness/Rationality</i>	169
4.7.2	<i>Measures of Financial Reporting</i>	170
4.7.3	<i>Measures of Rule Formalisation</i>	170
4.7.4	<i>Measures of Hierarchical Decentralisation</i>	171
4.7.5	<i>Measures of Lateral Communication</i>	171
4.8	Measures of Innovation: Descriptive Findings	174
4.9	Measures of Company's Financial Performance: Descriptive Findings	176
4.10	Concluding Remarks	176
	CHAPTER 5 Principal Component Analysis and Construction of Scale Indices	177
5.1	Introduction	177
5.2	Correlation Analysis with Selected Constructs	177
5.3	Principal Component Analysis Method	178
5.4	Principal Component Analysis of External Corporate Environment	180
5.4.1	Factor Structure	180
5.4.1.1	Factor 1: Environmental Dynamism in Marketing Practices (ENV1)	182
5.4.1.2	Factor 2: Environmental Customer Dynamism (ENV2)	182
5.4.1.3	Factor 3: Environmental Competitor's Dynamism (ENV3)	183
5.4.1.4	Factor 4: Environmental Complexity-Munificence (ENV4)	183
5.5	Principal Component Analysis for External Corporate Environment (Specifying the number of factors)	184
5.5.1	Factor Structure	184
5.5.1.1	Factor 1: Environmental Dynamism (ENV1)	185
5.5.1.2	Factor 2: Environmental Hostility/Munificence (ENV2)	186
5.5.1.3	Factor 3: Environmental Complexity/Homogeneity-Heterogeneity (ENV3)	186

5.6	Principal Component Analysis of Involvement in Strategic Decision-Making Process (eigenvalue greater than one)	187
5.6.1	Factor Structure	187
5.6.1.1	Factor 1: Formation and Process of Strategic Decision-Making Process (INVSDM1)	188
5.6.1.2	Factor 2: Formation and Evaluation of Strategic Decision-Making Process (INVSDM2)	188
5.6.1.3	Factor 3: Evaluation of Strategic Decision –Making Process (INVSDM3)	189
5.7	Principal Component Analysis of Involvement in Strategic Decision Making Process (specified the number of factors)	190
5.7.1	Factor Structure	190
5.7.1.1	Factor 1: Formation of Strategic Decision –Making Process (INVSDM1)	191
5.7.1.2	Factor2: Evaluation of Strategic Decision–Making Process (INVSDM2)	191
5.7.2	Concluding Remarks for Involvement in the Strategic Decision-Making Process	193
5.8	Principal Component Analysis of Strategic Decision-Making Process	193
5.8.1	Principal Component Analysis of Financial Reporting	193
5.8.2	Principal Component Analysis of Rule Formalisation	194
5.8.3	Principal Component Analysis of Hierarchical Decentralisation	195
5.8.4	Principal Component Analysis of Lateral Communication	196
5.9	Principal Component Analysis of Innovation Measures (eigenvalue greater than one)	197
5.9.1	Factor Structure	197
5.9.1.1	Factor 1: Product and Process Innovation (INNV1)	197
5.9.1.2	Factor 2: Organisational Innovation (INNV2)	198
5.10	Factor Structure (specified number of factors)	199
5.10.1	Factor 1: Product Innovation (INNPDP)	200
5.10.2	Factor 2: Process Innovation (INNPC)	200
5.10.3	Factor 3: Organisational Innovation (INNORG)	200
5.11	Principal Component Analysis of Organisational Performance Measures	202
5.12	Summary of Principal Component Analysis	203
5.13	Construction of Scale Indices from the Extracted Factors	203
5.13.1	Scale Composition	203
5.13.2	Reliability of Scales Indices	208
5.13.3	Validity of Scales Indices	208
5.14	Concluding Remarks	209
CHAPTER 6 Correlation, Multiple Linear Regression Modelling and General Linear Model (GLM) Analyses		210
6.1	Introduction	210
6.2	Preparation of Non-Factor Variables	210
6.3	Product moment Correlation Analysis: Hypothesis Testing and Discussion of Findings	211
6.3.1	Correlation Analysis Results	211
6.4	Analysis of the Results	216
6.5	Multiple Regressions: Model Evaluation, Misspecification Tests and Multicol-linearity Diagnosis	216
6.5.1	Introduction	216
6.5.2	Linearity	216
6.5.3	Homoscedasticity	217
6.5.4	Normality	217
6.5.5	Multicollinearity	218
6.6	Environmental Dimensions and Board Composition Characteristics	218
6.6.1	Introduction	218
6.7	Board Size and Board Composition Characteristics and Organisational Performance	224
6.7.1	Introduction	224
6.8	Involvement in the Strategic Decision-Making Process	228
6.8.1	Introduction	228

6.9	Board Demographic Characteristics, Environmental Circumstances and Strategic Decision-Making Process	235
6.9.1	Introduction	235
6.10	Board Characteristics, Environmental Dimensions and Innovation Strategies	243
6.10.1	Introduction	243
6.11	Organisational Performance	250
6.12.1	Introduction	250
6.12	Presentation of the Hypothesised Empirical Framework and Results	253
6.13	Concluding Remarks	257
	CHAPTER 7 Conclusions, Contributions and Directions for Further Research	258
7.1	Introduction	258
7.2	Conclusions of the Study	259
7.3	Novelty and Contributions	267
7.4	Implications of the Study	269
7.4.1	Introduction	269
7.4.2	Implication for Practitioners	269
7.5	Suggested Avenues for Future Research	271
7.6	Concluding Remarks	272
	References	273

APPENDICES		Page
APPENDIX A	Survey: Pilot Study	313
APPENDIX B	Survey Questionnaire in English	324
APPENDIX C	Survey Questionnaire in Greek	335
APPENDIX D	Correlation Matrix between Factor Items	346
APPENDIX E	Pearson Product- Moment Correlation Analysis	352
APPENDIX F	Regression Analysis Results	362
APPENDIX G	General Linear Model (GLM) Analysis Results	392
APPENDIX H	Summary of Hypotheses Testing	410

LIST OF FIGURES

Figures		Page
Figure 2:1	Typology of the Theories relating to Roles	34
Figure 2:2	Theoretical Framework of the Study	88
Figure 2:3	Hypothesised Research Model between Environmental Conditions and Board Structure	90
Figure 2:4	Hypothesised Research Model between Organisational Structure and Board Structure	93
Figure 2:5	Hypothesised Research Model of the Factors Affecting Board Involvement in Strategic Decision-Making	94
Figure 2:6	Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Strategic Decision-Making Process	94
Figure 2:7	Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Innovation Strategies	95
Figure 2:8	Hypothesised Research Model between BOD Involvement, Strategic Decision-Making, Innovation and Organisational	96
Figure 3:1	Research Design	115
Figure 3:2	The Process of selecting the Most Appropriate Source of Data and Data Generation Method.	116
Figure 6:1	Hypothesised Research Model between Environmental Conditions and Board Structure	219
Figure 6:2	Hypothesised Research Model between Organisational Structure and Board Structure	224
Figure 6:3	Hypothesised Research Model of the Factors Affecting Board Involvement in Strategic Decision-Making	229
Figure 6:4	Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Strategic Decision-Making Process	236
Figure 6:5	Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Innovation Strategies	244
Figure 6:6	Hypothesised Research Model between BOD Involvement, Strategic Decision-Making, Innovation and Organisational	251
Figure 7:1	Empirical Model Derived from Multiple Regression Analysis	264
Figure 7:2	Empirical Model Derived from General Linear Model Analysis	265
Figure 7:3	Final Empirical Model of the Study: The Influential Factors of Greek Executives' on Board Decisions	266

LIST OF TABLES

Tables	Page
Table A	20
Table B	22
Table 3:1	124
Table 3:2	127
Table 3:3	129
Table 4: 1a	151
Table 4: 1b	152
Table 4: 2a	154
Table 4: 2b	155
Table 4:3a	160
Table 4:3b	161
Table 4: 4	164
Table 4:5a	167
Table 4:5b	168
Table 4:6	172
Table 4:7	175
Table 4:8	176
Table 5:1a	179
Table 5:1b	179
Table 5:2a	181
Table 5:2b	185
Table 5:3a	190
Table 5:3b	192
Table 5:4	194
Table 5:5	195
Table 5:6a	196
Table 5:6b	196
Table 5:7	197
Table 5:8 a	199
Table 5:8 b	201
Table 5:9	202
Table 5:10a	204
Table 5:10b	205
Table 5:11a	206
Table 5:11b	207
Table 6:1	211
Table 6:2	253
Table 6:3	254
Table 6:4	256
Table 6:5	257

ABBREVIATIONS

ASE: Athens Stock Exchange
BOD: Boards of Directors
CEO: Chief Executive Officer
EMU: European Monetary Union
ESRC: Economic Social Research Council
EU: *European Union*
GPD: *Gross Domestic Product*
IPO: Initial Public Offerings
LSE: London Stock Exchange
NYSE: New York Stock Exchange
R&D: Research and Development
S.D: Standard Deviation
SD: Strategic Decisions
SDMP: Strategic Decision-Making Process
SMEs: Small-Medium Enterprises
SPSS: Statistical Package for the Social Sciences
TDM: Total Design Method
TMT: Top Management Team
U.K: United Kingdom
U.S: United States

CHAPTER 1

Context and Purpose of the Study

1.1 Introduction

This thesis reports a study of this topic, the aim of which is to empirically examine Board of Directors' attributes and environmental factors that are associated with strategic decisions in Greek listed organisations. This chapter provides an overview and the background of corporate governance and Boards of Directors, details the theoretical context, illustrates the general focus of the study, describes the aims and the objectives of the research, emphasises the academic interest and pragmatic significance of the study, and concludes with a description of the thesis structure.

1.2 Research Context

1.2.1 Introduction

This section presents the context of the undertaken research which lies on strategic management, executive leadership and corporate governance.

1.2.2 Strategic Management

Strategic management is generally acknowledged as a young discipline within the broader management area. Such emergent areas are typically characterized by debate, and challenges to existing paradigms (Kuhn, 1996). The interest of scholars in executives has increased over the past fifty years (Finkelstein and Hambrick, 1996). In the strategic management research, executives play a dominant role in formulating corporate strategy and in determining the direction of the firm (Westphal and Fredrickson, 2001). The Harvard model (Learned, Christensen and Andrews, 1961; Andrews, 1971) focuses on the personal role of executives in shaping the firms.

Andrews (1971) stated: "*Executives in charge of company destinies do not look exclusively at what a company might do and can do. They sometimes seem heavily influenced by what they personally want to do (p. 104).....We will be able to understand the strategic decisions better if we admit rather than resist the dimension of preference (p. 105).....*

Strategy is a human construction... (p. 107). In the Harvard model, the executives are regarded as pivotal for understanding what happens to the firm.

Several studies in upper echelons literature demonstrate that Boards of Directors and mainly their experience influence firm conduct and performance by determining its overall strategic direction (Westphal and Fredrickson, 2001; Walsh and Seward, 1990; Davis and Thompson, 1994). Some scholars have considered Boards of Directors as “*rubber stamps*” (Herman, 1981) or “*tools*” of top management (Pfeffer, 1972, p.219) who rely on top management team for leadership, direction and information. The central tenet of upper echelons theory is that executives create a “*construed reality*” of the firm’s strategic situation based on experiences and board characteristics that lead to specific strategic choices (Hambrick and Mason, 1984; Herrmann and Datta, 2006). Interest in the upper-echelons perspective derived from the economic based view of strategy (Hambrick and Cannella, 2001). Upper echelon research on managerial elites’ demographic characteristics such as age, education, functional background as well as cognitive values and bases shed light on their effect on corporate strategy (Wiersema and Bantel, 1992). In addition, Gupta and Govindarajan (1984), conducting an extensive study on executives concluded that general managers perform well when their experiences and personalities are aligned with business strategy.

Boards can influence the strategy of the firm in two ways. Boards influence strategy indirectly through “*decision control*” activities such as evaluation of strategic decisions, review of strategic plans and monitoring executive and firm performance (Fama and Jensen, 1983). Furthermore, Boards can influence strategy through “*decision management*” activities such as strategic proposals, asking probing questions about important issues and deciding on strategic alternatives (Judge and Zeithaml, 1992). Previous studies have shown that most of the Boards review strategy and performance (Fama and Jensen, 1983) but few boards have an influential role in strategic decisions (Mace, 1971; Vance, 1983).

1.2.3 Executive Leadership

Executive leadership has received increased attention from scholars in strategy and organisational theory. Executive leadership is crucial for achieving and maintaining competitive advantage in the 21st century. Since 1980, the nature of leadership has changed dramatically and there is a great awareness of communication and leadership problems

across contexts. Leaders are required to adjust their leadership style according to the society's needs. Organisations operating globally and nationally are asked to establish cross divisional and cross-country networks (Hambrick and Pettigrew, 2001). They argued that *“One of the central issues for strategic leadership in the modern corporation becomes the defraying of excessive complexity and ambiguity. The ability to deliver clear, simple and evocative messages that balance future goals with present needs seems to be a crucial simplifying routine in times of tension and change”* (Hambrick and Pettigrew, 2001, p. 43). They suggested that one of the key scopes of strategic leadership is to examine executive characteristics and strategic outcomes instead of executive team level to the board level.

Strategic leadership focuses on the executives who have the overall responsibility of an organisation and those characteristics have an impact on organisational outcomes. Executive literature focuses on composition of top management teams, executive succession, managerial styles, board-management relationships and the alignment of executives with environments and strategies (Finkelstein and Hambrick, 1996).

The executives who are the subjects of strategic leadership research can be individuals (e.g. Chief Executive Officers or division general managers), groups (Top Management Teams) or other governing bodies (e.g. Boards of Directors) (Finkelstein and Hambrick, 1996).

1.2.4 Corporate Governance and Boards of Directors

Corporate governance is an area that has grown rapidly in the last few years. In the past decade, corporate governance has received great interest among investors, governments, and the general public. The names of Enron, WorldCom, Parmalat and Global Crossing have become synonymous with corporate malfeasance and with some board members to try to deceive their own stakeholders and the public (Mallin, 2004). The corporate collapses have impacted many people: shareholders who see their financial investment reduced to nothing, employees who have lost their jobs and in many cases the security of the company pension which has also evaporated overnight, suppliers of goods and services to failed companies, and the economic impact on local and international communities in which the failed companies operate (Mallin, 2004, p. 1). The corporate scandals over the past decade focused the attention of the general public on questions of corporate governance in general and of Boards of Directors in particular. They revealed the inefficiency of monitoring the Top Management with catastrophic effects on stakeholders

(Lavelle, 2002) and scholars have discussed the governance implications for Boards of Directors (Tricker, 2000).

Significant reforms in corporate governance practices in the USA such as the Sarbanes-Oxley Act (2002), in Europe (OECD Principles on Corporate Governance, 2004), and more specifically in Greece (Principles of Corporate Governance in Greece, 1999; Corporate Governance Law.3016/2002) attempt to enhance investors' confidence and to increase transparency and accountability (Mallin, 2004). In the light of regulatory reforms, scholars have examined the role of Boards of Directors in corporate governance practices (Dalton and Dalton, 2005). These principles stressed the importance of corporate governance for long-term economic performance and strengthening of the international financial system. These principles have become signposts for corporate governance, board structures and practices, and are being widely endorsed by various organisations such as the International Monetary Fund, the World Bank, the United Nations and other international organisations (ICGN, 1999). After conducting an indepth-review of various corporate governance and codes in several countries, Carlsson (2001) stated that the common denominator of all these codes and principles is their emphasis on the importance of an independent and competent board.

More specifically, they attempted to examine the structure of Boards of Directors (Baysigner and Butler, 1985), their executives roles (Hermalin and Weisbach, 2000) and most important the impact of board configuration on firm performance (Dalton, Daily, Johnson and Ellstrand, 1999). The empirical evidence on the relation between firm performance and board composition is mixed. The inconclusiveness regarding the impact of the board can be explained by the fact that there is an emphasis on board structure rather than on the background, experiences and competences of board members. Recent research (Brouthers et al., 2000; Papadakis et al., 1998; Goll and Rasheed, 2005) takes into account a range of factors that might influence the impact of the board in firm performance. These include, among others, the roles of the board, the impact of board demographic characteristics, as well as environmental conditions and strategic decision-making processes. More specifically, scholars have attempted to examine the characteristics involved in these strategic decision-making processes and how they might in turn influence organisational outcomes. Nevertheless, very few studies have adopted multiple perspectives of the strategic decision-making processes and those that have done so, have

only examined these processes in the context of US or European large organisations (e.g. Child et al., 2003).

1.3 Focus and Significance of the Study

Since 1980, there has been an increased interest in the contribution of executives to the fate of the organisation (Bryman, 1992). The interest in Boards of Directors has become more evident in the U.K and in U.S where boards are placed in the centre of a number of financial scandals involving major public companies and corporations (Lorsch and MacIver, 1989). A basic premise in strategic management is that Boards of Directors play a dominant role in formulating corporate strategy. According to Gioia and Chittipeddi (1991, p.234), *“the CEO is portrayed as someone who has primary responsibility for setting strategic directions and plans for the organisation, as well as responsibility for guiding actions that will realise those plans”*. The major roles of Boards of Directors are: firstly, to act as boundary spanners by linking the organisation to critical resources in the environment and (Zald, 1969; Pfeffer, 1972) secondly, to play an administrative and internal control role and to be responsible for policy formulation and for monitoring management (Zald, 1969; Fama and Jensen, 1983).

Pearce and Zahra (1991) suggested that powerful boards provide useful links between the organisation and the external environment; which lead to the protection of shareholders' rights and create a corporate identity. Also, Tricker (1978) states that: *‘the work of director in and out of the boardroom is rated as the most under-researched management topic’*. There are prescriptive and descriptive writings regarding Boards of Directors, their composition (inside/outside director, independent/affiliated directors, and executive/non-executives and interlocking directors), their leadership structure as well as their demographic characteristics (Pfeffer, 1972; Baysigner and Butler, 1985; Hermalin and Weisbach, 1991). However, there are inherent difficulties in exploring the effects of Boards' demographic characteristics to firms' performance and effectiveness (Pettigrew, 1992). Stewart (1991) argued that there is limited knowledge even on the basic similarities and differences of chairpersons, CEOs and Boards of Directors.

Indeed, the research on Boards of Directors is limited in scale and scope and overall considered to be at an early stage of development (Pettigrew, 1992). Previous studies have attempted to examine the relationship between leadership and innovation (e.g. Halbesleben et al., 2003; West et al., 2003), but most of these works did not focus on actual leaders

which are the Boards of Directors (Yulk, 1999). Even studies that have explored the linkage between executives' demographic characteristics and innovation strategy (e.g. Bantel and Jackson, 1989; Enns, Huff and Golden, 2003) failed to investigate the leadership behaviour and their effect on innovation process (Cannella and Monroe, 1997). Scholars (Papadakis, Lioukas and Chambers, 1998; Elenkov, 2002) argued that strategic decisions and consequently strategic choices are influenced by top managers and external environment. However, there is lack of knowledge regarding the moderating effects of the relationship between leadership and organisational outcomes (Antonakis, Avolio and Sivasubramanian, 2003).

Researchers agree that predictions about the impact of board demographic characteristics and organisational performance are not clear. Pettigrew argued that: "*Great inferential leaps are made from input variables such as board composition to output variables such as board performance with no direct evidence on the processes and mechanisms which presumably link the inputs to the outputs*" (1992, p.171).

First, recent Boards of Directors' research failed to establish any association between demographic characteristics and organisational outcomes (Schwenk and Dalton, 1991; Johnson et al., 1996; Zahra and Pearce, 1989).

Second, the assumption regarding the direct relationship between demographic characteristics and corporate performance seems to be unreliable. Lawrence (1997) conducted an extensive survey where she found that the explanations about demography outcome relationships are not supported by the theory. Therefore, scholars have to open the "*black box*" within Boards of Directors' dynamics and understand the impact of the environment on board as well as on strategic decision -making processes and strategic choices and subsequently on organisational performance. There is a need for further studies on board members' structure and demographic characteristics, culture and processes linked to theoretical traditions such as agency theory and managerial hegemony (Kosnik, 1987; Fama and Jensen, 1983; Davis, 1991).

Hambrick and Mason (1984) have introduced the upper echelons perspective in macro-organisational research. They suggest that "*organisational outcomes-both strategies and effectiveness –are viewed as reflections of the values and cognitive bases of powerful actors in the organisation*" (1984, p.193) and provided the foundations for further research

on an organisation's dominant coalition. Eschewing "*some important but complex psychological issues*", Hambrick and Mason (1984, p.193) recommend that their primary focus is on managerial characteristics as indicators of the given that a manager brings to an administrative situation. These observable managerial givens are demographic factors such as age, tenure in the organisation, functional background, education, socioeconomic roots and financial position.

This study is actually based on the work of Hambrick and Mason (1984), drawing upon and modifying their theoretical framework. More specifically, this research applies and expands the model of Hambrick and Mason (1984) on upper echelons to the study of Boards of Directors. This is a fruitful undertaking as the business literature focused on Top Management Teams is dominated by contradictory findings and neglects the role of the board in strategy formulation and in strategic choices. This study attempts to rectify that by dedicating more effort to the study of Boards of Directors. In the model developed by Hambrick and Mason (1984) regarding upper echelons, fundamental constructs were added such as: board composition, board involvement in strategic decision-making process as well as characteristics of strategic decision making processes, strategic choice of innovation and organisational performance.

1.4 Research Aim and Objectives

The primary aim of the study is to develop a conceptual framework that explains how Boards of Directors' attributes and environmental conditions shape board level decisions. The study aims to determine the factors that influence Boards of Directors' strategic decisions. For practitioners, this study examines the factors of effective decisions.

Objectives

In broad terms the research objectives can be stated as follows: "An investigation" of

1. The impact of external environment on Boards of Directors' composition, on board involvement in strategic decision-making, on several characteristics of the strategic decision-making processes and on innovation practices.

2. The effects of Boards of Directors' structure and demographic characteristics on involvement in strategic decision-making processes and on strategic choice of innovation.
3. The effect of Boards of Directors' strategic decisions on the performance of Greek companies listed in the Athens Stock Exchange.

1.5 Statement of Significance

This thesis makes a significant contribution to the strategic management literature by developing an integrative model that combines factors associated with three perspectives on the strategic decision-making processes and strategic choice of innovation: (1) environmental dimensions, (2) board structure characteristics and (3) board members' demographic characteristics. This is the first study to the best of the author's knowledge that develops an integrative framework that combines elements of both content and process of strategic decisions.

Also, the proposed theoretical framework is tested for the first time empirically and theoretically. It uses a multi-dimensional empirically grounded representation of strategic decision-making processes and on strategic choice of innovation in order to test their effect on performance. Also, it incorporates both composition and demographic attributes of board members. In this study, Boards of Directors are regarded as a social construction and board members are understood through their attributes, working styles, and actual board task performance as well as their processes inside the boardrooms.

Unlike other studies, that focus on top management teams, this study focuses on Boards of Directors using theories drawn Top Management Teams as there is little empirical work on them.

This study is making one more novel contribution. The empirical component of this work refers to Greek quoted firms in the Athens Stock Exchange. It is the first study conducted in Greece that has valuable empirical data from Boards of Directors of listed firms. Also, corporate governance in Greece is at an early stage. The last couple of years have seen some legislation regarding corporate governance operations and practices but these practises have not been examined through a systematic theoretical framework before.

This study thus aspires to provide meaningful insights into the processes of Boards of Directors' strategic decisions with important implementations to academics and business practitioners. It provides a comprehensive understanding on the process of strategic decisions and reveals the influential factors of their decisions. The study will thus enable Greek executives to identify key factors behind their strategic decisions and determine the ones that contribute to organisational performance. Therefore, this study can provide deeper understanding and useful suggestions for effective organisational strategy.

1.6 Limitations of the Thesis

The thesis has to be examined in the light of its limitations. The limitations reported in this study refer to general limitations of theoretical or conceptual issues as well as research design approach. The study should be interpreted under the following limitations:

- Literature on Boards of Directors is not so extensive and most of the issues which are comparatively new to the context, in which the research was applied, might cause inconsistencies or drawbacks in the assumptions and findings.
- The questionnaire was filled in by a single respondent of each listed in the ASE firms. Data was collected from a single source (e.g. Chairman, CEO or board member) since they are regarded as the apex of an organisation and the most knowledgeable respondents for this study. This methodological approach has been used in previous studies (e.g. Goll and Rasheed, 1997; Hart and Banbury, 1994; Jones et al., 1992). It will be highly recommended in future research the use of multiple respondents per firm in order to minimise effects of systematic response bias.
- The sample consists only of listed companies in the Athens Stock Exchange Market from various industries, a fact that implies that we are not be able to make generalisations at the industry level. The results are representative of medium and large sized enterprises in Greece and are not necessarily generalisable to other sectors and countries. Maybe, smaller firms might conclude with different results.

- Variety of constructs has been examined in order to give a holistic perspective instead of focusing on one issue.
- Several researchers have examined the role of “*upper echelons*” in the strategic decision-making process (e.g. Hambrick and Mason, 1984; Miller and Toulouse, 1986; Papadakis and Barwise, 1997; Elbanna and Child, 2007)).
- Organisational performance is the outcome of environmental, structural and managerial factors as suggested in previous studies (Papadakis and Lioukas, 1996; Rajagopalan et al., 1993). Thus, the lack of a strong relationship between strategic decisions and firm’s performance should be interpreted with caution. Dess (1987, p. 261) argued that a major limitation of current research is “...the tendency to disregard the heterogeneity of environments in which managers make their strategic decisions”. Therefore, it has to be taken into consideration that strategic decisions might influence organisational performance under certain environmental circumstances.
- The explanatory variables that have been chosen with reference to strategic decisions are not exhaustive of those three perspectives. Therefore, the results derived could be the outcome of this theoretical model and other explanatory variables in a different model could derive different results.
- The retrospective and cross-sectional nature does not allow us to draw causal inferences and makes impossible the examination of different variables. Of course, the organisational performance has been measured prior to any managerial decisions. But, our results are subject to causality versus relationship. The answer depends on the model chosen from interpretations of results. The results of the study are interpreted as an effort to shed light on strategic decisions-performance relationship.
- The variables are measured based on managerial perception and therefore, they have a degree of subjectivity. However, Boards of Directors have a comprehensive knowledge and understanding about business strategy.
- The study employs quantitative methods, which emphasise the limitations of techniques used in order to assure reliability instead of providing explanations and theorisation (Robson, 2002). The generation of data was based mainly on

questionnaires and questionnaires are related to some key limitations such as: low response rate, limited volume of data capable of being generated and the possibility of biases being present in the sample frame, greater risk for missing data (Bryman and Bell, 2003; Paxson, 1992; Chawla and Natarajan, 1994).

- A lengthy questionnaire was constructed in order to capture the constructs of the study which required time from the executives to fill it. If the questionnaires were more comprehensive, we might have a higher response rate. Although, the response rate of our sample was 39.6% which is considered to be representative to the population of Greek listed organisations in the ASE.

1.7 Structure of the Thesis and Order of Presentation

The study has been structured in eight chapters in order to reflect the main aim and the research objectives of the study.

Chapter One introduces the overview and the background of the study. It presents the aim of the study and the research objectives and also refers to academic interest and significance of the study.

Chapter Two examines thoroughly the existing literature in the area of corporate governance and Boards of Directors. It presents the main issues of the study: importance of corporate governance, corporate governance theories, the roles of Boards of Directors, environmental dimensions, Boards of Directors and their characteristics, their involvement in strategic decision-making process, characteristics of strategic decision-making processes, and the impact of Boards of Directors on the strategic choice of innovation. Also, a theoretical research model has been proposed and research hypotheses have been developed.

Chapter Three presents the research method of the study explaining the epistemological approach, the research design, the conceptualisation and operationalisation of variables associated with the phenomenon of Boards of Directors; the data analysis methods as well as the data collection methods.

Chapter Four presents the descriptive research findings from the empirical survey and discussed on a construct by construct basis.

Chapter Five presents and discusses multivariate statistical methods in order to analyse the data and investigate the interrelationship between the constructs and among the variables within each construct. It presents the findings that derived from principal component analysis which demonstrate the underlying dimensions of each construct. Scales indices are constructed from the derived factor solutions and the results of scale reliability and validity are presented.

Chapter Six describes the correlation analysis procedure and provides an in depth discussion of the hypothesis testing results. It also presents the results derived from multiple regression and GLM analyses. It provides an insight on the key factors that influence the strategic decisions of Greek executives.

Chapter Seven summarises the main findings of the study. It provides useful insights on the implications of the study relating to academic and management practice. Finally, it suggests avenues for future research that could provide some useful insights for upper echelons and how they influence firm's strategy.

1.8 Concluding Remarks

The introductory chapter serves as a plan for the thesis. It provides a background of the research area; it introduces the aim and the research objectives; it underlines the novelty of the study and concludes with the structure of the thesis.

CHAPTER 2

Theoretical Framework of the Study and a Review of Boards of Directors Literature

2.1 Introduction

The chapter provides the basic for the following chapters in that it creates the theoretical ground for the research that will be constructed in this thesis. The main purpose of this chapter is to review current theories in the area of corporate governance and Boards of Directors and how they influence organisational decisions. The specific themes that have been analysed are: corporate governance alongside corporate governance theories, the roles of Boards of Directors, the environmental dimensions, the Boards of Directors along with their composition and demographic characteristics, their involvement in strategic decision-making process, the characteristics of strategic decision-making processes, the strategic choice of innovation and finally, the organisational performance.

The literature review is a critical analysis of business and management research on the topic that posits the research in its theoretical context, shows that the current state of the research topic is understood and supports any conceptual framework (theories, models, concepts and hypotheses) (Maylor and Blackmin, 2005, p. 117). According to Hart (1998, p.198), the literature review demonstrates a clear understanding of the research topic, identifies the major studies related to the research area, identifies the different points of the views on the research topic, draws clear and appropriate conclusions, clearly states a research problem, proposes a way to investigate the research problem and demonstrates the relevance and importance of the research problem.

2.2 Corporate Governance

In the last few years, corporate governance has received a great deal of attention among academics, markets' regulators, international organisations and business practitioners (Keasey, Thompson and Wright, 1999; Lazzari *et al*, 2001). Nowadays, companies are facing growing demands to evaluate the performance and the effectiveness of their boards. The need for effective Boards of Directors has become more evident after the major corporate scandals in the U.S (i.e. Enron, Tyco, WorldCom, Adelphia), in Europe (i.e.

Parmalat), and worldwide where Boards of Directors and their strategic decisions have led giant corporations to disastrous collapses. Corporate scandals have resurrected public suspicion that there is plenty of potential for mischief inside large public companies. The recent corporate failures as well as poor corporate governance practices remain the main obstacle for investments. Corporate collapses have an impact on many people: shareholders who see their financial investment reduced to nothing, employees who have lost their jobs and in many cases the security of the company pension which has also evaporated overnight, suppliers of goods and services to failed companies, and the economic impact on local and international communities in which the failed companies operate (Mallin, 2004, p. 1). The financial scandals and collapses revealed the inefficiency of monitoring the top management with catastrophic effects to stakeholders (Lavelle, 2002). Therefore, there is an increased awareness of investors and politicians to focus their attention on tightening up governance processes.

The governance of companies has been an issue of increasing interest in recent years given the concerns expressed about the standards of accountability and financial reporting of firms. The pressure comes from a variety of sources, but, most obviously from regulators and shareholder activists. Regulatory reforms have cascaded across the world starting with Cadbury, 1992 in the United Kingdom and elaborating afterwards with Greenbury, 1995; Hampel, 1998; Combined Code, 1998; Turnbull, 1999; Higgs, 2003, Smith, 2003; the revised Combined Code, 2003; Corporate Governance: A Practical Guide, 2004; Good Governance: The Code of Governance for Voluntary and Community Sector, 2005; Internal Control: Revised Guidance for Directors on the Combined Code, 2005; Good Practice Suggestions from the Higgs Report, 2006; Guidelines for Disclosure and Transparency in Private Equity, 2007; The Combined Code of Corporate Governance Revised June 2008), with the U.S Sarbanes-Oxley Act (2002) in U.S, with the OECD Principles on Corporate Governance, 2004 and the Guidelines on Corporate Governance of State-Owned Enterprises, 2005 in Europe. These codes emphasise formal board structure and board characteristics such as board size, number of independents, executives and non executives, the separation of roles between CEO and Chairman and the establishment of board committees for listed firms. The development and implementation of corporate governance codes is an attempt to protect institutional investors, to rebuild their trust and to give them the responsibility to exercise their power and influence the companies in which they invest by minimising the risk for potential collapses, by guaranteeing that the companies are run effectively and efficiently. The codes are considered to be the pillars of

transparency, disclosure and accountability of investors. In their turn, institutional investors have to recognise their responsibilities and exercise their power in a formal and systematic way (Mallin, 2006). They enhance the confidence of investors, fund managers, insurers, capital markets and urge greater levels of evaluation and transparency of boards. The governance of companies has been the subject of increasing interest in recent years given the concerns expressed about the standards of accountability and financial reporting of companies. In the era of corporate governance, the new cultural and legal frameworks aim to establish ethical standards in an effort to protect shareholders and enhance an ethical economic landscape that creates the pillars for a healthy management and promotes trust (Gold and Dienhart, 2007).

2.3 Corporate Governance in Greece

In Greece, corporate governance has been a topic of increased interest in the boardrooms due to spectacular crises of traditional Greek firms, which revealed the passive board supervision as well as the allegations of fraud against corporate executives. The collapse of the Athens Stock Exchange and the international pressures toward a more mature market status and shareholder-oriented model of governance is being directed at reforming the existing system. More specifically, the European Union (EU) has pressurised for harmonious laws and regulations and for convergence of corporate governance systems especially after the addition of new member states (Spanos, 2005). Corporate governance in Greece emphasises the protection of individual and shareholders' interest. The concept of corporate governance became more evident in 1998 when the ASE published an introductory paper.

During the period 1997–2000, the Greek economy was characterised by its attempt to readjust its macroeconomic indicators and achieve the Maastricht criteria to become the 12th member of the “*EURO Zone*” in 1999, that is, achieving Economic and Monetary integration in the European Union; an accomplishment that was realised on the 1st January 2001. By the end of 2000, the Greek economy had transformed into a “*modern*” economy with an updated structure (Tsipouri and Xanthakis, 2004). From 1997 until September 1999, the Athens Stock Exchange experienced an increase of six percent and it grew faster than any other capital market in the developed world and it has increased the number of listed companies (approximately 350 companies with combined market capitalisation 10.5 billion euros) (Mertzanis, 2001).

The Greek capital market has experienced a cycle of self-fulfilling expectations during the second and third quarters of 1999. The massive entrance of individual and institutional investors in the market mainly through small and medium capitalisation led to an increase in stock prices and liquidity (Spanos, Tsipouri and Xanthakis, 2008). In particular, in September 1999, the ASE suffered losses that on the average accounted for almost 70 per cent of its peak value. The cycle of self-fulfilling expectations ended up in a significant divergence between actual prices and equilibrium prices. Greece has scored very low regarding the quality of law enforcement and accounting standards. Since then, the Hellenic Capital Market Commission (HCMC) and Athens Stock Exchange have attempted to implement some investor protection reforms and measures in order to enhance the market's transparency, protect shareholders rights, improve corporate governance mechanisms and eventually, to restore the public trust (Spanos, 2005; Mertzanis, 2001). Despite the fact that Greece has been in the EU since 1980, research in the area is still underdeveloped (Bourantas and Papadakis, 1996; Makridakis et al., 1997), as there is limited empirical evidence in the area of management in advancing countries in general.

It is worth mentioning that during the last couple of years, enormous progress has been made on the legal framework governing the operations and behaviour of Greek corporations as well as the Greek legislation regarding corporate governance. The Committee on Corporate Governance in Greece (under the coordination of the Hellenic Capital Market Commission) and the Federation of Greek Industries have developed voluntary corporate governance codes. Since the beginning of the 20th century the major legal framework ruling the operations and behaviour of Greek firms was the co-called 2190/1920. In the meantime, a number of presidential decrees have been introduced such as 350/1985 and 51/1992; however, there was an urgent need for updated legislation (Alexakis, Balios, Papagelis and Xanthakis, 2006). The first step toward the formation of a comprehensive framework on corporate governance has been the publication of the "Principles of Corporate Governance in Greece" (Committee on Corporate Governance in Greece, 1999), which contains the following seven main categories: the rights and obligations of shareholders, the equitable treatment of shareholders, the role of stakeholders in corporate governance, transparency, disclosure of information and auditing, Boards of Directors, the non-executive members of Boards of Directors and executive management (Mertzanis, 2001).

The increasing maturity of capital market conditions and the gradual globalization of the gradual transactions laid the foundation of the structural transformation of the Greek economy. The unprecedented capital growth in Greece required the introduction of more efficient corporate governance. The first influential report in Greece was the Principles of Corporate Governance in Greece: Recommendations for the Best Corporate Governance Practice (1999) which suggests accountability and transparency of the actions of directors and managers. The effort to make more accountable the Greek listed organisations derives from the Anglo-Saxon model; however Greece should not be construed as the wholesale purchase of the Anglo-Saxon model. Greece should move towards the integration of Anglo-Saxon elements into the Greek system while developing national solutions to problems that are unique to the Greek business landscape. On a micro level, the regulatory forms will enable Greece to maintain its position as a competitive partner in the European Union (Mertzanis, 2001).

Regarding the legal framework in Greece, Greek companies are governed by Law 2190/1920 as well as by Law 3016/2002. The general meeting of shareholders is the main decisionmaking organ of the company. Regarding the board structure, Greek organizations are characterized by the co-existence of the unitary system where shareholders directly elect the directors through the shareholder general meeting and of the two-tier system which combines supervisory and management functions, but generally delegates day-to-day management. The board should consist of at least three members and is required to meet at least once a month. For the listed companies, at least 1/3 of the total directors must be non-executive, of which at least two must be independent. Under Law 2190/1020 directors and senior managers are prohibited from receiving loans by the company. Article 23 of Law 2190/1920 prohibits directors from engaging professionally, on their own behalf or on behalf of others, in activities covered by the objectives of the company in which they are directors and be general partners in a partnership that pursues the same objectives as the company they serve as directors. In Europe, there are governance models that exhibit mechanisms and organs in the areas of audit/control and director's nomination. In Greece, an internal auditor is appointed by the board which is hierarchically integrated in the management of the company but remains independent in the exercise of his duties (Mertzanis, 1999; 2001 and Xanthakis et al., 2003).

The Greek capital market has been transformed largely during the last four years. Three new markets were established: the Athens Derivatives Exchange, the New Market for

small and innovative firms and the Market for Emerging Markets. At the same time, the new electronic trading system (OASIS) in the Athens Stock Exchange expanded the possibilities for efficient and transparent transactions. The Capital Market Commission, the main regulatory authority of the Greek capital market, completed a wide range of institutional changes. The regulatory activities include the protection of investors, the enhancement of market transparency, the protection of the systems of trading and clearing, the enactment of codes of conducts and the assurance of the smooth function of the capital market.

Corporate governance is still far from adequate; for example ownership concentration of the listed companies is still high. The ownership dispersion in Greece is perceived as middle to low. Greece presented a high concentration of ownership (La Porta et al., 1999). A recent study of HCMC (2001) in a sample of 370 listed organizations found that the average ownership dispersion was 47.22 per cent when the major shareholder is defined as the shareholder owning at least 5 per cent. 370 Greek listed organizations were held by 974 major shareholders while the major shareholders per listed company were 3. The competition for control at company level is low. Usually large families control most of the small-and-medium-sized companies.

Recent laws and regulations have been introduced to restore public confidence, to protect (minority) shareholder rights and to improve corporate governance mechanisms. Moreover, the corporate governance debate has been largely debated among academics and the business world, resulting in many voluntary activities (e.g. corporate governance codes, rating actions).

The Committee on Corporate Governance (CCG) in Greece was introduced in October 1999 the "*Principles of Corporate Governance in Greece: Recommendations for its Competitive Transformation*". This code was developed on the basis of internationally accepted corporate governance practices and according to OECD Principles on Corporate Governance (OECD, 1999).

The Greek code contains forty-four recommendations compiled on seven main categories:

- The rights and obligations of shareholders (e.g. encourages voting by institutional investors and discourages multiple voting procedures and the issuance of non-voting privileged shares).

- The equitable treatment of shareholders (e.g. transactions based on insider information or undertaken for private benefit should be prohibited).

- The role of stakeholders in corporate governance (e.g. encourage active participation between corporations and stakeholders).

- Transparency, disclosure of information and auditing (e.g. full, timely and detailed disclosure of information, establishment of an Internal Audit Committee consisting solely of non-executive directors).

- The board of directors (e.g. maximum board size of 13, with a majority of non-executive directors, external advice to directors).

- The non-executive members of the board of directors (e.g. definition of independence, compensation of non-executive directors should be comparable to the time they devote for board meetings, compensation should be reported separately in the corporation's annual report).

- Executive management (e.g. performance-based compensation for executives, compensation committee to review management compensation, appointment of the CFO in the top management team).

In 2000, the Hellenic Capital Market Commission has established "a code of conduct for companies listed in the Athens Stock Exchange and their affiliated persons" (CMC Rule 5/204/2000). The code sets behavior standards for ASE listed companies and specifies duties and obligations of companies' major shareholders, the members of the board of directors, the executive management or other individuals or legal entities relating to them. Each company shall ensure the prompt disclosure of information or fact occurring in its domain of activity, which are not accessible by the public and which may cause significant

fluctuation in the price of its shares. Furthermore, the code specifies the organization, structures and internal operation mechanisms necessary for best serving shareholders' interests and investor interests in general. The aim is to eliminate uncertainty in the market on corporate affairs, protect shareholders and to prevent speculation by company insiders or other persons that may have inside information (Xanthakis *et al.*, 2003).

The Committee on Corporate Governance in Greece and the Federation of Greek Industries have developed voluntary corporate governance codes. Moreover, the University of Athens has recently established a rating system for the ASE listed companies based solely on corporate governance criteria. Finally, the Athens Stock Exchange announced in July 2002 the voluntary qualitative criteria covering corporate governance, transparency and communication with investors. The aforementioned corporate governance codes in Greece are presented in the Table A below.

Table A: The Evolution of Corporate Governance in Greece	
Date	Corporate Governance Activity
1998	The Athens Stock Exchange conducts a study on corporate governance
1999 April	OECD Principles on Corporate Governance
1999 October	Corporate governance code (voluntary) by the Committee on Corporate Governance in Greece (under the coordination of the Capital Market Commission)
2000	The Ministries of National Economy and Development set up a law making committee on corporate governance (Rokkas Committee)
2000 July	Capital Market Commission rule: "Tender offers in the capital market for the acquisition of securities (CMC Rule 1/195/2000)
2000 November	Capital Market Commission rule: "A code of conduct for companies listed in the Athens Stock Exchange and their affiliated persons" (CMC Rule 5/204/2000).
2001 August	Principles of Corporate Governance by the Federation of Greek Industries
2002 March	A corporate governance rating system is presented by the Center of Financial Studies of the University of Athens (a project funded by the Athens Stock Exchange)
2002 May	Law 3016/2002: "On corporate governance, board remuneration and other issues"
2002, July	The Athens Stock Exchange establishes qualitative criteria covering corporate governance, transparency and communication with investors

2.4 Definitions of Corporate Governance

The term “*corporate governance*” can be interpreted by different point of views. Some authors, such as Shleifer and Vishny (1997, p.2), defined corporate governance as “*the ways in which suppliers of finance to corporations assure themselves of getting a return of investment*” emphasising economic return, security and control.

Donaldson (1990, p.376) defined corporate governance as the “*structure whereby managers at the organisation apex are controlled through the board of directors, its associated structures, executive initiative, and other schemes of monitoring and bonding*” thereby narrowing the scope to the board of directors and their structures.

Weiner and Pape (1999, p. 152) consider corporate governance as a system where economic, social, political and cultural factors interact under “*a more or less country specific framework of legal, institutional and cultural factors shaping the patterns of influence that stakeholders (e.g. managers, employees, shareholders, creditors, suppliers and the government) exert on managerial decision-making*”.

Kaplan and Norton (2000), analysed corporate governance from the political point of view focused on general shareholder participation, as such define corporate governance as the connection between directors, managers, employees, shareholders; customers, creditors and suppliers to the corporation and to one another.

In addition, the Chairman of the Committee on the Financial Aspects of Corporate Governance Sir Adrian Cadbury (2000, p. 8) defined corporate governance as “*the system by which companies are directed and controlled*”. He described *Boards of Directors* as a critical link between those who provide the capital and those who direct the flow of the capital. He suggested that the two important issues that characterise the function of Boards of Directors are accountability towards the capital providers and performance in terms of attainment of goals.

2.5 Theories

Numerous corporate governance theories have been developed which are discussed below (Table B presents the main theories in corporate governance). Table B presents the key theories in corporate governance, their theoretical origin and their representative studies.

Table B: Theories in Corporate Governance

Theoretical Perspective						
	Agency	Stewardship	Resource Dependency	Stakeholder	Managerial Hegemony	Class Hegemony
Board Role	Ensure match between managers and shareholders	Ensure the stewardship of corporate assets	Reduce uncertainty; boundary spanning	Inclusive pursuit of stakeholder interests	Board “ <i>a legal fiction</i> ”	Perpetuate elite and class power
<i>Theoretical Origin</i>	Economics and finance	Organisation theory	Sociology	Politics, Law, and Management theory	Organisation Theory	Sociology
<i>Representative Studies</i>	Fama and Jensen (1985) Jensen and Meckling (1976) Kosnik (1987)	Donaldson and Davis (1991) Donaldson and Davis (1994)	Pfeffer (1972) Pfeffer and Salancik (1978)	RSA (1995) Blair (1995)	Mace (1971) Lorsch and MacIver (1989)	Mills (1981) Useem (1980)

Adopted by Philip Stiles, London Business School (1997)

2.5.1 Agency Theory

The dominant theoretical lens for examining corporate governance is agency theory. Agency theory as it can be seen in Table B has been a dominant approach in the economic and finance literature (Fama and Jensen, 1983) and describes the relationship between two parties with conflicting interests: the agent and the principal (Jensen and Meckling, 1976). For agency theorists, the role of the board is to ratify and monitor the decisions of the top management team (Fama and Jensen, 1983). Agency theory deals with aligning the interests of owners and managers and it is based on the assumption that there is an inherent conflict between the interests of the firm's owners and its managers (Fama and Jensen, 1983; Fama, 1980; Jensen and Meckling, 1976). Agency theory provides a framework that explains the conditions under which directors can carry out their fiduciary responsibilities (Johnson, Ellstrand, Dalton and Dalton, 2005). Agency theory provides a rationale for how organisations have to be governed through two mechanisms: the external; the market for corporate control and the internal, primarily among Boards of Directors (Roberts, McNulty and Stiles, 2005).

Fama and Jensen (1983) introduced a decision-management model, which involved four steps decision model. Professional managers are responsible for the *decision management role*, which requires decision initiation (first step) and decision implementation (third step) and in which decision alternatives are created and developed and if approved by the board then they can be implemented. The board as fiduciary of the shareholders is responsible of the stockholders and has decision control role, which requires decision ratification (step two) and monitoring (step four) and involves examining and accepting or rejecting alternatives proposed by management. The sine qua non of the model is the independence between the two classes of actors who are responsible for these roles. In this way, the shareholders delegate responsibility to executives within the organisation in effort to reduce agency cost occurred by principals by imposing internal control to the agent's self-serving behaviour under control (Jensen and Meckling, 1976). This is achieved by exercising decision control, which involves monitoring managerial-decision making and performance (by appointing independent and non-executive directors as well as outside directors).

The model is based on the assumption that there is conflict between the interests of managers and those of directors. The agency theory underlines the importance of monitoring and governance function of boards (Pearce and Zahra, 1992; Zahra and Pearce,

1989) and the need for establishment mechanisms in order to protect shareholders from management's conflict of interest (Fama and Jensen, 1983). It finally suggests that boards should consist of outside and independent directors, also that the position of Chairman and CEO should be separate (Daily and Dalton, 1994). When the separation of those two roles is violated mainly when the Chairman is under the influence of the CEO, the agency cost becomes great and the firm will suffer in the financial and control market (Johnson, Ellstrand, Dalton and Dalton, 2005).

Agency theory does not apply at all managerial decisions and does not necessarily result in increase of wealth for principals or in favourable outcomes. Jensen and Meckling (1994) criticised the model of man mainly for its simplification of mathematical modelling and its unrealistic description of human behaviour on strategic decisions. Also, it has been criticised for the isomorphism between managers and shareholders interests (Donaldson, 1995). Doucouliagos (1994) stated that it can not explain the complexity of human action. Hirsch et al., (1987) described it a broad-brush approach which diminishes empirical verisimilitude and includes less robust policies. Another criticism is related to how agency theory has a negative impact on society. Ghoshal and Moran (1996) accused agency theory of being one of the main reasons for some of the corporate scandals. Agency theory also embodies incorrect assumptions including: opportunism, shareholder value supremacy, ownership and separation of roles and time perspective and discrete contrasts (Huse, 2007). Alternative theories on corporate governance and Boards of Directors are proposed.

2.5.2 Stewardship Theory

In the context of critiques of agency theory, alternative theories of corporate governance are proposed and notably stewardship theory (Davis, Schooman and Donaldson, 1997). As it is presented in Table B stewardship theory has its roots in organisational theory and more specifically in psychology and sociology (Boyd, 1995; Donaldson, 1990; Donaldson and Davis, 1991) and aims to examine the situations where executives as stewards are motivated to act according to the interests of their principals (Donaldson and Davis, 1991). The behaviour of the steward is collective, because the steward aims to achieve the objectives of the organisation (sales growth, profitability) (Davis et al., 1997). Stewardship theorists believe that there is a strong association between the organisational success and the principal's satisfaction. Stewardship theory suggests that there is no conflict of interest

between managers and owners and both parties can cooperate in order to achieve a “*goal alignment*” (Davis et al., 1997; Donaldson, 1990; Donaldson and Davis, 1991; 1994).

Stewardship theorists argue that managers are not motivated by self-interested behaviour and their goals are consistent with those of shareholders (Davis et al., 1997; Lane, Cannella and Lubatkin, 1998). Stewards are motivated by higher –level needs towards a collective good of their firms to which they are committed to make it succeed at any cost (Davis, Schoorman, Mayer and Tan, 2000). Their behaviour is organisationally centred since they take decisions in the best interest of the group. Their performance is mainly affected by structural situations in which the steward facilitates effective decisions (Davis, Schoorman and Donaldson, 1997). Stewardship theorists contend that superior corporate performance is associated with the majority of inside directors because; first, they ensure more effective and efficient decision- making and second, they contribute to maximise profits for shareholders (Kiel and Nicholson, 2003). Regarding the leadership structure, stewards maximise their utility because they achieve organisational rather than self-serving objectives (Davis et al., 1997). Stewardship theory has to be examined in the light of some boundaries. Tricker (1994) stated that stewardship theory “*ignores the dynamics of boards, inter-personal perceptions of roles and the effect of board leadership*”. Stewardship theory does take into consideration the power of conflict and the ideology of different parties.

The fact that the steward is consistently motivated by organisational objectives, diminishes the control of the steward over the decisions and decreases his or her motivation (Argyris, 1964). Therefore, stewardship theorists focus on structures that facilitate and empower rather than those that monitor and control (Davis, Schoorman and Donaldson, 1997, p. 26). In an owner-executive relationship, risk-averse executives are self-serving and prefer agency governance prescriptions. However, implementing stewardship governance practices will not be suitable for an agent. The mixed empirical findings from both agency and stewardship theories (Donaldson and Davis, 1994) suggest a need for theoretical pluralism which will be critical to the progress of governance research (Roberts, McNulty and Stiles, 2005).

2.5.3 Resource Dependency Theory

Proponents of resource dependency theory (Jeffrey Pfeffer and Gerald Salancik) attempted to explain organisations in terms of their interdependence with the environment (Pugh and Hickson, 1997, p. 62; Pfeffer and Salancik, 1978). Resource dependency theory as explained in Table B is about the dependency relationship of one organisation with the external environment of resources (Pfeffer and Salancik, 1978; Pugh and Hickson, 1997). According to resource dependency theory, organisations are interdependent with their environment or other organisations for their survival. Since organisations are not self-directed and self-dependent (Pugh and Hickson, 1997, p. 62; Daft, 2001, pp. 146-147), they require resources for survival such as money, materials, personnel, information and technology. The degree of interdependency varies according to three conditions: first, availability of resources, second, control over the allocation of resources and third, the extent to which those who control those resources develop a monopolistic behaviour (Pfeffer and Salancik, 1978; Pugh and Hickson, 1997, p. 62).

Resource dependency theory proposes that corporate board is a mechanism for managing external dependencies (Pfeffer and Salancik, 1978), reducing environmental uncertainty (Pfeffer, 1972) and the environmental interdependency (Williamson, 1984). Pfeffer (1972) stated that board composition reflects the firm's external dependencies and it is expected any environmental change to affect strategic changes in board composition. Boards of Directors can be used in order to decrease interorganisational dependencies by establishing interlocking directorates (Burt, 1980) or co-optation strategies (Pfeffer, 1972). According to resource dependency theory, directors act as a linkage between the firm and the external environment which generate uncertainty and external dependencies. Organisations are requested to comply with uncertainty as well as with different environmental changes in order to survive (Pfeffer and Salancik, 1978; Thompson, 1967). Resource dependency theory also views outside directors as a critical link to the external environment (Pfeffer and Salancik, 1978). The theory predicts a relationship between the extent of uncertainty and dependence and the composition of the board with respect to boards' size and proportion of outside board members. Although some scholars provide support to the logic behind the resource dependency theory (e.g. Pfeffer and Salancik, 1978; Boyd, 1990; Gales and Kesner, 1994), they cannot explain how board composition will vary in size or in proportion of inside or outside directors according to various environmental dimensions.

2.5.4 Stakeholder Theory

Stakeholder theories encompass all the important consistencies of the firm in its governance mechanisms and stress their fundamental importance. Freeman (1984) defined stakeholders as group or individuals who can affect or be affected by the actions of an organisation. Stakeholders include a variety of government and other non-profit organisations that exist within the community. Carroll (1996, p. 74) stated that stakeholder is “*any individual or group who can affect or is affected by actions, decisions, policies, practices or goals of the organisation*”. Clarkson (1995) in defining stakeholder theory stated that: “*Firm is a system of stakeholders operating within the larger system of the host society that provides the necessary legal and market infrastructure for the firm’s activities. The purpose of the firm is to create wealth for its stakeholders by converting their stakes into goods and services*”. Clarkson defined a stakeholder as “*those persons or interests that have a stake, something to gain or lose as a result of its (the corporation’s) activities*” (Clarkson, 1998, p.2). Stakeholders are consumers, suppliers, government, competitors, communities, employees and stockholders (Carroll, 1996, pp. 84-88).

Stakeholder management takes into consideration the interests and concerns of various groups and individuals in order to achieve a decision that satisfies all parties (Buchholz and Rosenthal, 2005). Since stakeholders (i.e. employees, owners, investors, customers, government, community) of the firm provide the essential inputs and infrastructure in order to be achieved, it follows that they should be included in the government centres that are responsible for the firm’s fate. Their inclusion, however, in the corporate governance mechanisms should be limited to the extent that their interests are threatened because they usually lack the managerial knowledge and long-term experience to take strategic decisions. The firm and its managers have special obligations to ensure that the shareholders receive a “fair” return on their investment, but the firm also has special obligations to other shareholders, which go above and beyond those required by law. Stakeholder management involves taking the interests and concerns of these various groups and individuals into account in arriving at a management decision in order to reach a desirable outcome (Carroll, 1996).

2.5.5 Institutional Theory

In early years, Hughes (1936) presented institutions as stable and slowly changing social systems. Selznick (1957) regarded institutionalisation as a process by which organisations or social entities are pervaded with values beyond the technical requirements of their tasks. Institutional theorists argue that institutions are socially constructed templates for actions generated and maintained through ongoing interactions. In this way, they regard institutions as providers of framework and procedures that certain organisations should follow. Burns and Flam (1987) defined institutions as shared rules that categorise social actors, their activities and their relationships. Sociologists believe in supra-individual units of analysis that cannot be reduced to aggregations or direct consequences of individual motives (DiMaggio and Powell, 1991). From the sociological point of view, institutionalisation is *“a phenomenological process by which certain social relationships and actions come to be taken for granted and shared cognitions that define what has meaning and what actions are possible”* (Zucker, 1983).

The institutional theory framework for modelling firm behaviours suggests that organisations attempt to incorporate norms in their institutional environments so that they can gain legitimacy, resources, stability and enhanced survival prospects (Di Maggio and Powell, 1983; Meyer and Rowan, 1977). DiMaggio and Powell (1983) have introduced the concept of isomorphism and they believe that competitive and institutional types of isomorphism might be sources of pressure for the organisations. By competitive isomorphism, they refer to similar organisations due to market competition (Di Maggio and Powell, 1983), which focuses on population ecologists (Hannan and Freeman, 1977). DiMaggio and Powell (1983) claimed that there are three mechanisms through which institutional isomorphic change occurs, each with its own antecedents: 1) coercive isomorphism that stems from political influence and the problem of legitimacy; 2) mimetic isomorphism resulting from standard responses to uncertainty; and 3) normative isomorphism, associated with professionalisation. Mimetic isomorphism change as a response of individuals to environmentally constructed uncertainties.

Isomorphism is used in order to reduce the impact of uncertainty, to enhance the issue of co-ordination, during emergencies; it may serve the purpose of reducing human casualties, by supporting a holistic approach on emergency management.

Despite the differences, institutional theory suggests that institutions have a significant influence on the behaviour of individuals and organisations. This theory explores the relationship between institutions and organisations (e.g. DiMaggio, 1988; Meyer, Scott and Deal, 1983; Olivier, 1991; Zucker, 1987), the behaviour of organisations and the organisation's competitive advantage (Olivier, 1997).

Institutional theory proposes that firms should appoint outside directors, while subtly limiting their independence (Westphal, 1999; Zajac and Westphal, 1996). Scholars have examined the effects of institutions on specific dimensions of organisations such as organisation form (e.g. Arndt and Bigelow, 2000), performance (e.g. Carroll et al. 1988), and strategy (Chang and Choi, 1988). However, institutional theory has been criticised by scholars for the lack of attention to strategic behaviour of organisations in response to the institutional process that affects them (Drazin and Van de Ven, 1985).

2.5.6 Managerial Hegemony Theory

The managerial hegemony theory as it is presented in Table B describes the board as a legal fiction: a co-opted appendage institution that despite its governing power over management is ineffective in mitigating conflicts between management and stockholders (e.g. Galbraith, 1967; Mace, 1971). Therefore, board's role is restricted to be "*another management (-dominated) tool*" (Pfeffer, 1972, p.219), a passive "*rubber stamp*" for management's proposals and decisions (Herman, 1981). The instrumental view of corporate board emphasises that management control over corporate affairs becomes more spread among small stockholders (Berle and Means, 1932; Winter, 1964). The directors' passive behaviour derives from lack of knowledge about company's affairs (Estes, 1980), dependence on information and insights provided by company's top executives (Bacon and Brown, 1975) and the prestige and status that are associated with board membership (Mills, 1981; Vance, 1983). The theory of managerial hegemony describes the board as an ineffective governing institution, which lacks of independence regarding outside directors from incumbent management.

2.5.7 Upper Echelons Theory

The upper echelons perspective has developed since Hambrick and Mason's 1984 introduction. The theory has its roots in the behaviour theory of the firm (March & Simon, 1958; Cyert & March, 1963). According to this theory, decision makers are often unable to

make economically rational decisions because they are bound by rationality and must act in a social context of multiple and conflicting goals. Hambrick and Mason (1984) extended these ideas in their upper-echelons perspective. Hambrick and Mason (1984) formalized the upper echelons perspective, "*proposing that senior executives make strategic choices on the basis of their cognitions and values and that the organisation becomes a reflection of its top managers*" (Finkelstein and Hambrick, 1996, p. 6). Finkelstein and Hambrick further formalized the upper echelons perspective as strategic leadership theory. The theory links these observable demographic characteristics of the TMT to organisational processes and outcomes (Finkelstein & Hambrick, 1996; Hambrick & Mason, 1984; Knight et. al., 1999). Further, the "*theory states that organisational outcomes can be partially predicted from managerial backgrounds*" (Hambrick & Mason, 1984, p. 197) and executives will make decisions as a team that are consistent with their cognitive base of executive orientation (Hambrick & Mason, 1984; Knight et. al., 1999, p. 447). The cognitive base consists of two elements: psychological characteristics and observable experiences. A fundamental principle of upper echelons theory is that observable experiences (i.e., demographic measures) are systematically related to the psychological and cognitive elements of executive orientation. Upper echelons research employs the use of observable demographic characteristics as proxy measures of executive orientation (Knight et. al., 1999, p. 447).

Upper-echelons theory emphasises on the effects of executives on corporate strategy, but it neglects the governance context in which corporate elites are situated. Upper-echelon theorists generally do not place emphasis on governance differences and combine the CEO and other executives into the top management team unit of analysis (e.g. Hambrick and Mason, 1984), or even suggest combining the top management team with the nonexecutive directors into a supra-TMT (Hambrick and Finkelstein, 1996).

2.5.8 Structuration Theory

Structuration theory is based more on the '*humanist*' strands of sociology rather than '*scientific*' strands. Giddens' structuration theory is an attempt to '*put sociology back together again*'. Its starting point is that the division between structural and social action approaches is essentially false. It attempts to reconcile structural and interpretive sociology and subjectivism and objectivism. It distinguishes between '*system*' and '*institution*'. *Social systems* refer to reproduced practices. *Institutions* refer to reproduced rules and resources. '*Systems*' and '*institutions*' do not exist independently of individual activity

rather they only exist insofar as they are continually produced and reproduced via the duality of structure (Giddens in Layder 1998 p. 140). Structure exists only at the instances where rules and resources are employed in social activity-*instatiation*. According to Giddens, *structure* refers to the visible patterning of social relations; it is the *rules* and *resources* that actors draw upon as they produce and reproduce social activity. '*Structure is not external to action rather it is internal to the flow of action which constitutes social practices*' (Layder 1998). Also, the structures both *enable* and *constrain* action. 'Sociology should be concerned first and foremost with reworking conceptions of human *being* and human *doing*, social reproduction and social transformation' (Giddens, 1984). It rejects determinism; the notion that structural forces externally constrain and determine behaviour. It rejects objectivism; here are no '*objective*' '*social facts*', '*structures*', '*systems*' or '*institutions*' rather peoples reasons and motivations are central to sociological analysis. Subjective understandings and relationship between '*observer*' and '*observed*' are central. It rejects functionalism; social systems cannot be analysed independently of actors. Also, it rejects reification of the social system; social systems do not have sets of needs (ie adaptation/ integration/ equilibrium as in functionalism) that are independent of the needs of social actors. It rejects dualism but accepts a *duality of structure*. According to structuration theory, the individuals constantly monitor their actions, they are aware and conscious of what they do but, but they may not do things purposively. They sometimes do things without intending to do them, and things they do intend to do have unintended consequences. In the duality of structure, agency is both structured, and reproduces and revitalises the structure. It occurs through time and unintended consequences of actions modify future intended actions.

One of the criticisms of structuration theory is that it cannot address the emotional "constitution" of society. Also, the objectivity of constraints in Giddens' theory (Archer, 1982, p. 479) has been questioned.

2.5.9 Overview of Corporate Governance Theories

Various corporate governance theories have been analysed with respect to their advantages and drawbacks, but the phenomenon of Boards of Directors cannot be explained thoroughly by adopting a single theoretical approach. Table B provides a comprehensive overview of the corporate governance theories and their key proponents. Theoretical pluralism is recommended as a critical progress of corporate governance research. Eisenhardt (1989a) argued that apart from agency theory additional perspectives will

facilitate the capture of the complexity of the phenomenon. Stewardship theory argues that managers have the same interests as shareholders; whilst resource dependency theory emphasises on the linkage role of directors with the external environment. Regarding the validity of agency and stewardship theory, Donaldson and Davis (1991, p. 61) stated that “*each may be valid for some phenomena but not for others*”. Hillman and Dalziel (2003) recommended to link agency and resource dependency theory. Furthermore, Daily, Dalton and Cannella (2003, p. 372) concluded that “*a multi-theoretic approach to corporate governance is essential for recognising the many mechanisms and structures that might reasonably enhance organisational functioning*”. A multi-theoretical approach will help to overcome the limitations of different theories and it will allow us to focus more on the “inner workings of boards” (Hermalin and Weisbach, 2003; Pettigrew, 1992).

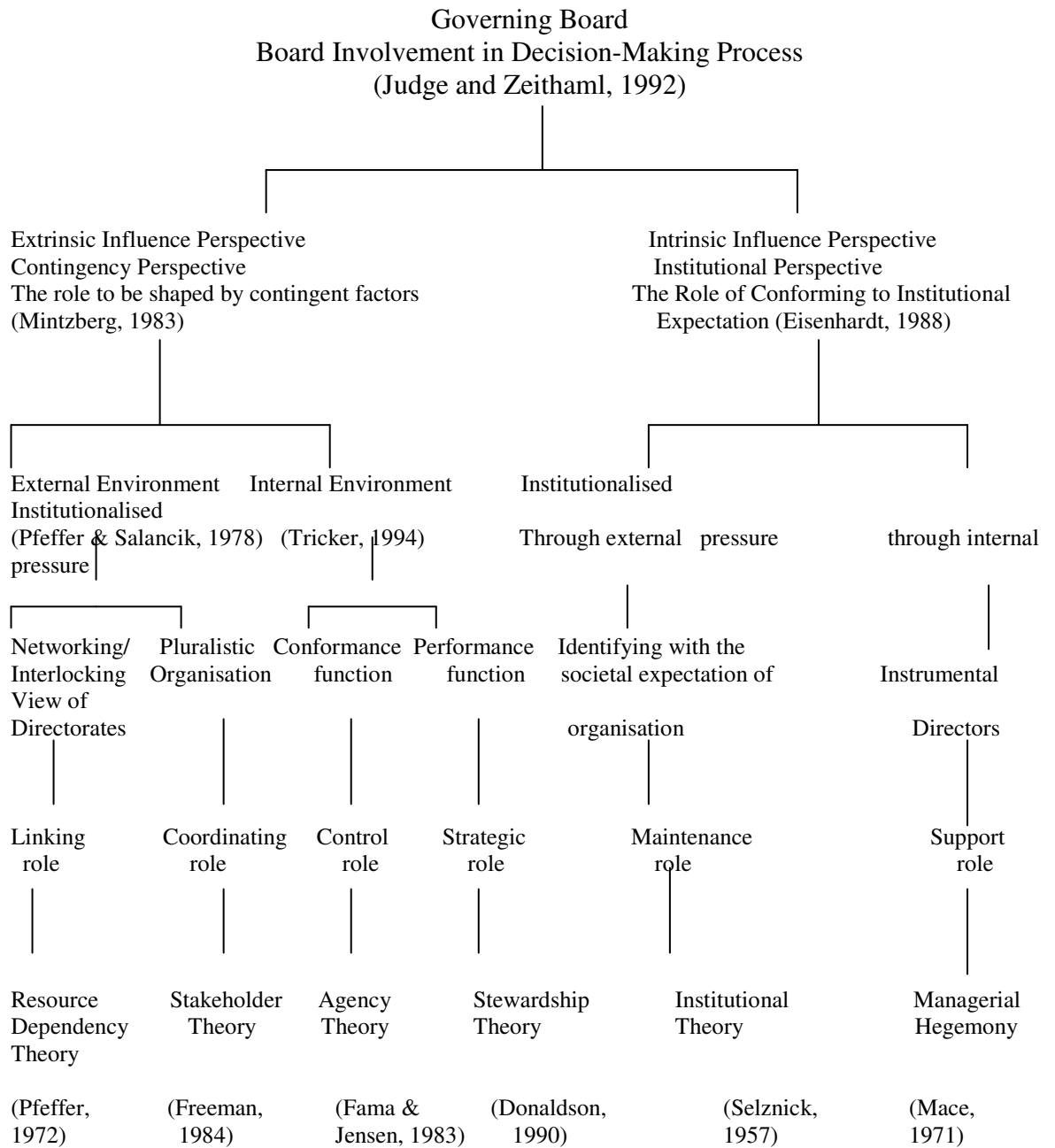
2.6 Boards of Directors and their Roles

Scholars (e.g. Monks and Minow, 1995; Ooghe and De Langhe, 2002) regard Boards of Directors as an important mechanism-entity within the company that creates a link between the shareholders and managers and therefore plays an important role in the corporate governance system of the firm. Board of Directors is one mechanism that contributes to the solution of the problems arising from separation of ownership from control. Board has the obligation to determine the firm’s overall strategy and to ensure the protection of shareholders (Keenan, 2004). It exists primarily in order to hire, fire, monitor, compensate management and vote on important decisions in an effort to maximise the value of shareholder (e.g. Fistenberg and Malkier, 1994; Salmon, 1993; Denis and McConnell, 2003; Becht et. al., 2002). According to Iskander and Chambrou (2000), Board of Directors is the centre of the internal system of corporate governance and, in this scope, has the responsibility to assure long-term viability of the firm and to provide oversight of management. Bhojraj and Sengupta (2003) asserted that the Boards of Directors have the fiduciary duty of monitoring management performance and protecting shareholders’ interests. Other roles of board are the institutional role, strategy role, disciplinary role, figurehead role, ethical role, auditing role and class hegemony role (e.g. Hung, 1998; Zahra and Pearce, 1989).

In the literature, they have been identified six major roles of governing boards: *linking, coordinating, control, strategic, maintenance and support*. These roles are consistent with and reflect one of the main schools of thoughts: resource dependency theory, stakeholder

theory, agency theory, stewardship theory, institutional theory and managerial hegemony. Judge and Zeithaml (1992) developed a typology by studying two theoretical perspectives: the *institutional* and the *strategic choice*. The *institutional perspective* or *intrinsic influence perspective* examines the organisational structures and processes as the result of socialisation and institutionalisation. The institutional perspective is a deterministic theoretical framework, which focuses on environmental norms and social influences beyond the control of the organisation. On the contrary, *strategic choice* or *extrinsic influence perspective* focuses on the actions that the organisation's members take in order to adjust to the environment. It emphasises nondeterministic explanations of organisational processes and outcomes. Gupta, Dirsmith and Fogarty (1994) indicated that these two opposite approaches explain the reasons for the development of different formal structures. According to the contingency perspective, governing bodies are formulated by task, environment and technical nature they perform, while, institutional perspective suggests that an organisation has to be conventional with the institutionalised demands of traditional practices and customs and influence the choice of control and coordination mechanism. Judge and Zeithaml (1992) have developed a typology with the theories in corporate governance relating to board (Figure 2:1).

Figure 2:1 Typology of the Theories relating to Roles



2.6.1 Linking Role and Resource Dependency Theory

The linking role of board is explained by resource dependency theory, which assumes that corporations depend on each other in order to gain access to valuable resources and establish links in an effort to regulate their interdependence as it can be seen in Figure 2:1. An interlocking director is a type of link in the complex chain of connections among organisations. An interlock director is the social relationship between two or more corporations when an executive is a member on one or more boards (Scott, 1985). Participating in various boards provides access to finance and operations as well as to specific corporate information of the firm and the required resources are allocated in favour of the interlocking corporation (Hung, 1998). Governing board acts as a *linking* instrument of the organisation to the external environment since it enhances its legitimacy and assists in achieving its goals of efficiency and performance (Pfeffer, 1972). Ornstein (1984) considered governing boards as vehicles that corporations use to control other organisations and to coordinate business activities among corporations.

Interlocking directors are regarded as media or channels for transmitting information about the industry in which they work (Penning, 1980). Pfeffer and Salancik (1978) argued that interlocking directorates facilitate corporations first, to obtain valuable resources and second, to control other organisations through manipulation of available resources. Useem (1978) stated that directorship-interlocking directors could be an advantage for organisations because they cause threats or uncertainties to other organisations. Interlocking directors have been examined from the intraclass or class solidarity approach. According to this approach, individuals within the capitalist class have a unified interest. In an effort to achieve their interests, capitalists establish links with each other (Palmer, 1983). Mace (1971) observed that a type of “*roundtable*” set up by top managers having as primary objective the “effective and efficient operations for corporations”.

2.6.2 Coordinating Role and Stakeholder Theory

Stakeholder theory is a pluralistic approach to organisations. Freeman (1984) defined a stakeholder as “any group of individuals who can affect, or is affected by, the achievement of a corporation’s purpose”. In this perspective, corporations are responsible for many social groups and their primary purpose is to balance the conflicting interests of different groups. It recognises that this requires direction and supports the coordinating role of governing board.

Wang and Dewhirst (1992) considered that stakeholder theory explains how members of governing boards perceive the interests of corporate constituencies and how organisations are managed. For the institutional point of view, Kotter and Heskett (1992) argued that stakeholder theory is used to identify the connection between stakeholder management and achievement of social responsibility.

2.6.3 Control Role and Agency Theory

The control role derives from agency theory and the relevant studies are described in Figure 2:1. According to Eisenhardt (1989a), agency theory describes the relationship between two parties; the principal and the agent, which have divergent interests and attitudes toward risk. Agency theory deals with the solution of problems that arise between the agent and the principal. Fama and Jensen (1983) proposed that agency theory describes a governance system that limits the agent’s self-interest behaviour in circumstances of ambiguity between agent and principal. Therefore, Fama and Jensen (1983) proposed that the role of the governing board is to act as a ratifier of the decision that is implemented and a controller in monitoring the implementation and performance of the decisions.

2.6.4 Strategic Role and Stewardship Theory

Stewardship theory emphasises the performance function or the *strategic role* of a governing board as it is presented in Figure 2:1. According to Donaldson (1990), stewardship theory suggests that governing board is responsible for the setting of strategies. Andrews (1981) proposed that board involvement in strategy evaluation should be limited. According to stewardship theory, the role of governing board in this theory is the guidance of management towards attainment of mission and objectives.

2.6.5 Maintenance Role and Institutional Theory

The institutional theory explains the impact of institutionalisation from pressure outside a governing board. According to institutional theory, Ingram and Simons (1995) argued that organisations are constrained by social rules, which shape the form and practice of organisations. The maintenance role of a governing board in response to institutional pressure is focused on indoctrinating the organisation by interpreting the external environment (Hung, 1998). Figure 2:1 incorporates the governance role of board. Corporate governance is an act performed by a governing board as “*a highly objectified and exterior*” process in conformity with the norms derived from the socialisation board members (Berger and Luckman, 1967). Regarding the institutional impact of governing board, Scott and Meyer (1983, p. 140) considered that it includes all the necessary rules and requirements that individual organisations need to receive support and legitimacy.

2.6.6 Support Role and Managerial Hegemony

The institutional force applied to managing boards is explained by the managerial hegemony theory. Managerial hegemony occurs when the Board of Directors serves as a “rubber stamp” and it does not get involved in the strategic decisions (Whisler, 1984; Mace, 1971). The *support* role derives from objective and subjective factors. The subjective factors indicate that Boards of Directors deny involvement in the strategic decision making because, firstly, directors are appointed by managers, secondly, directors are chosen into the organisation and thirdly, they have accrued benefits from directorship which act as an incentive to compliance. Regarding the objective reason, governing boards are constrained from making independent decisions because they rely on information provided by management (Hung, 1998).

2.7 Environmental Factors and Influences

2.7.1 Introduction

An important theoretical perspective in the strategy and organisational theory suggests that the performance of the organisation is associated with the environmental dimensions (Romanelli and Tushman, 1988; Keats and Hitt, 1988).

Numerous scholars have attempted to investigate the “*fit*” between strategy and the external environment (e.g., Andrews, 1980; Miller and Friesen, 1983; Venkatraman and Prescott, 1990; Wiersema and Bantel, 1993; Anderson and Zeithaml, 1984; Bourgeois, 1980; Hambrick, 1988) or organisational characteristics such as structure (Chandler, 1962; Rumelt, 1974), administrative systems (Lorange and Vancill, 1977; Galbraith and Nathanson, 1978) and managerial characteristics (Gupta and Govindarajan, 1984). More specifically, Romanelli and Tushman (1988) claimed that: “...*where environments are changing and/or performance outcomes are low or declining, leadership’s primary task is to intervene in ongoing patterns of commitment and exchange to redirect the character of an organisation’s relationship with its environment*” (p. 130). This indicates that successful executives are required to examine the external environmental conditions prior of any crucial decision. Organisation’s environment enhances and limits activities and behaviours within the boundaries of the firm (e.g., Duncan, 1972; Aldrich, 1979; Dess and Beard, 1984). Research has shown the impact of environment to organisational life as strategy (Porter, 1980; Miller, Droge and Toulouse, 1988), structure (Lawrence and Lorch, 1967; Keats and Hitt, 1988), organisational processes (Rajagopalan and Finkelstein, 1992). A few studies have examined the interrelationships between the environmental dimensions and board characteristics.

2.7.2 Environmental Dimensions

Several attempts have been made by researchers to describe the environment (e.g., Aldrich, 1979; Emery and Trist, 1965; Lawrence and Lorsch, 1967; Thompson, 1967; Duncan, 1972) but Tan and Litschert (1994) have observed two dominant perspectives in organisational environment research. The first perspective is the information uncertainty, which considers the environment as the source of information (Duncan, 1972; Lawrence and Lorch, 1967; Tung, 1982). The research emphasised perceived uncertainty rather than objective data gathered from the participants of the organisation (Tan and Litschert, 1994).

The second perspective is known as resource dependence, which posits that scarce resources exist in the environments, which are sought after by competing firms (March and Simon, 1958; Pfeffer and Salancik, 1978). As the environment becomes less munificent or more hostile, it can be conceived that firms experience greater uncertainty. Therefore, executives manage these conditions by reducing the firm's dependence or by increasing its control over these resources that affect the firm's overall organisational effectiveness (March and Simon, 1958).

Emery and Trist (1965) stated that organisations change according to environmental circumstances. They proposed a typology, which identifies four "ideal types" of organisational environments.

The simplest type is called *the placid, randomised environment* where goals and noxians do not alter and are randomly distributed. The organisation's viewpoint is that there is no difference between tactics and strategy and organisations exist as single and adaptive small units. The second type is called *the placid, clustered environment*, which is also static but goals and noxians are not randomly selected. Under these environmental conditions, there is a need for strategy within large organisations that require centralised control and co-ordination.

The third type is called *distributed-reactive environment* and is more dynamic than static and is a clustered environment in which there is more than one system of the same kind. Control becomes more centralised to allow these to be conducted. In addition to these perspectives, the environment has been empirically examined as multidimensional constructs. On the other hand, stability may require a certain coming-to-terms between competitors.

The fourth type is called *turbulent fields*. In these dynamic processes, component organisations arise from the environment itself. The turbulence derives from the complexity and multiple characters of causal interconnections.

Aldrich (1979), after an extensive review of the literature on population ecology theory and resource dependence theory that "*refer to the nature and the distribution of resources in environments with different values on each dimension implying differences in appropriate structures and activities*" (1979, p. 63), he identified the following six dimensions of

organisational environments: *capacity*, *homogeneity-heterogeneity*, *stability*, *concentration*, *consensus* and *turbulence*. The six environmental dimensions are presented and described briefly below.

- Capacity is the relative level of resources available to organisation.
- Homogeneity-heterogeneity is the degree of similarity between elements of the domain population.
- Stability is the degree of turnover in environmental elements.
- Concentration is the degree to which resources are evenly distributed over the environment.
- Consensus is the degree to which an organisation's claim to a specific domain is disputed by other organisations.
- Turbulence is the degree of interconnection among elements in environment (1979, p. 74).

Dess and Beard (1984) condensed Aldrich's (1979) codification of environmental dimensions into the following three dimensions; *munificence*: capacity, *dynamism*: stability-instability, turbulence, *complexity*: homogeneity-heterogeneity, concentration-dispersion. They developed a multi-dimensional construct of environment which includes "*munificence*" in terms of resource abundance and resulting capacity to support growth; "*dynamism*" primarily reflected instability (volatility) and "*complexity*" as heterogeneity and concentration of environmental elements. These perspectives offer a better understanding of the external environment and its impact on firm's strategy. These environmental dimensions help executives to have a clear understanding of environmental uncertainty and how it might influence strategic decision characteristics such as propensity for risk-taking, futurity, proactiveness and defensiveness (Miles and Snow, 1978; Miller and Friesen, 1982).

2.7.2.1 *Environmental Complexity* refers to the number of environmental factors that encroach on organisations (Thompson, 1967); environmental instability is defined by the rate of change in these factors (Thompson, 1967); environmental munificence refers to the extent to which the environment supports sustained growth (Starbuck, 1976). Environmental complexity was defined as heterogeneity in the environment and the concentration of resources. Child (1972) conceptualised environmental complexity as "*the*

heterogeneity of and range of an organisation's activities" (1972, p.3). Duncan (1972) argued that managers who deal with complex (i.e. heterogeneous) environments will perceive greater uncertainty and have greater information-processing requirements than managers with simple environments.

Organisations operating in complex environments are confronted with conflicting demands from multiple constituencies (Thompson, 1967). Managing these stakeholders might require various skills and competencies that force companies to adopt more structural differentiation (Pfeffer and Salancik, 1978). As Gupta (1988, p.160) stated: "*The more diverse an organisation's environment, the more necessary it becomes to have a differentiated top management team in order to appropriately monitor the diversity of the environment*". Environmental complexity requires significant changes in the organisation and affects a wide range of organisational functions (Russo and Fouts, 1997).

Executives operating in complex environments will experience difficulty in identifying the key strategic factors and to use valuable resources and capabilities (Black and Boal, 1994). Environmental complexity has been also operationalised as heterogeneity in the environment (e.g. Dess and Beard, 1984; Keats and Hitt, 1988). Firms in complex environments face problem-solving situations and they require larger and more heterogeneous TMT to cope with the circumstances (Janis, 1972). Heterogeneous groups are likely to develop diverse interpretations and perspectives (Wanous and Youtz, 1986). In less complex environments, this heterogeneity is not needed and it might create communication barriers (Zenger and Lawrence, 1989) and conflict (Ebadi and Utterback, 1984). Thompson (1967) argued that the degree of environmental complexity creates challenges for Top Management and larger coalition.

However, environmental complexity promotes greater differentiation within the Top Teams and reduces the opportunity for executives to interact, share resources and operate in a cohesive manner. Environmental demands characteristics require task specialisation and make coordination difficult to achieve (Mintzberg, 1979). As Galbraith (1973) has argued, complexity forces greater specialization and decentralization, reduces opportunities for coordination and increases the number of individuals involved in decision-making and their decision-making independence.

2.7.2.2 *Environmental Munificence*: Munificence was defined as the relative level of resources available in an environment and was measured by growth at industry level. Starbuck (1976) described munificent environment as the extent to which the environment can support sustained growth. Rajagopalan et. al. (1993, p. 359) pointed out “*uncertain environments that are also munificent (e.g. high growth industries in initial stages of industry evolution) are very different from environments that are far less munificent (e.g. mature industries with declining demand or increasing competition). Hence, the performance effects of comprehensiveness are likely to be different across these environments*”. Aldrich (1979) and Starbuck (1976) state that organisations pursue permit organisational growth and stability which enable organisations to accumulate slack resources (Cyert and March, 1963). Munificence gives organisational flexibility and growth opportunities (Aldrich, 1979) and limits external threats (Cyert and March, 1963). The lack of external threat allows agreement and cooperation between TMT members.

On the other hand, environmental munificent offers TMT a variety of choices on how to compete and diversity on opinions (Dess and Origer, 1987). Organisations that operate in munificent environments have available resources and the problem is how to use these resources. Munificent environment provides the chance to the organisation to obtain resources for the development of additional capabilities and make a better use than the competitors (McEvily and Zaheer, 1999). The availability of resources increases the possibility for innovation and favours the changes in structures required to generate a proactive environmental strategy (Aragón-Correa and Sharma, 2003). Williamson (1963) has suggested that organisations with available resources tend to hire more executives. Jensen (1986) claimed that top managers with “*free cash flow*” tend to engage a more non-profit maximising behaviour. In contrast, companies that focus on cost containment tend to reduce the staff (Hofer, 1975). Therefore, environmental munificence has an impact on board size (Keats and Hitt, 1988; Bantel and Finkelstein, 1995).

2.7.2.3 *Environmental Dynamism/Instability*: The second environmental dimension was dynamism, which was defined as the level of turbulence or instability facing an environment and measured by variability in growth rates. The literature in organisation theory and business-policy theory refers to dynamism as a measurement of environmental stability-instability. Therefore, the terms “*dynamism*” and “*instability*” are used interchangeably. Organisations that operate in dynamic industries will be more likely to show some homogenous elements of their environment that enable them to copy with

uncertainty (Simon and March, 1958). Thompson (1967, p.159) considered dealing with uncertainty the “*essence of the administrative process*”. Uncertainty also affects organisation structure because as task uncertainty increases, more information must be processed among decision makers to achieve a given level of performance (Galbraith, 1973, p. 4).

Aldrich (1979) stated that environmental turbulence “*leads to externally induced changes...that are obscure to administrators and difficult to plan for*” (1979, p. 69). Aldrich focused on the extent of interdependence among environmental connections. Pfeffer and Salancik argued that interconnections among organisations create uncertainty and that “*changes can come from anywhere without notice and produce consequences unanticipated by those initiating the changes and those experiencing the consequences*” (1978, p.68).

Environments vary on the extent to which they are characterised by unpredictability and unexpected change (Mintzberg, 1979). This environmental instability can affect the way organisations are structured and operate and the composition of top management teams. Environmental instability may refer to the “*steady-state*” rate of change in environmental factors that affect the organisations (Thompson, 1967) or to the extent of discontinuous change in the environment (Tushman and Romanelli, 1985). Environmental instability might affect TMT as well as board heterogeneity and size. Instable environments increase the variation and fragmentation of managerial work (Mintzberg, 1973) and therefore, enlarge the information-processing demands on the top team (Daft, Sormunen and Parks, 1988). The information –processing requirements of unstable environments have two effects on Top Teams: greater heterogeneity and greater size. As environments become unstable, the TMT has to increase the information absorbed and recalled, the different perspectives on a problem and the recommendations required (Shaw, 1981). Therefore, the greater information-processing capabilities of larger and more heterogeneous groups are needed to adapt to the greater information-processing requirements of unstable environments (Haleblian and Finkelstein, 1993).

Environmental instability might affect other aspects of TMT as well as the Boards of Directors. Challenging environments create demands on TMT and on board members to adapt to environmental requirements (Pfeffer and Salancik, 1978). TMTs face greater information processing and decision-making demands (Kotter, 1982) and pressure to reach

decisions (Eisenhardt, 1989b). This results in less interdependence and social integration among group members. TMT consensus will be more difficult to attain due to instability and diversity of perspectives (Khandalla, 1977). This diversity of opinions might create conflicts and make consensus elusive. In contrast, higher consensus may be relatively achievable in stable environments (Priem, 1990). The more unstable the environment is, the less the degree of role interdependence within TMTs.

According to organisational theory perspective, a strong and unified leadership structure is easier to adapt to environmental demands (Mintzberg and Waters, 1985). A single leader has more power to make critical decisions (Harris and Helfat, 1998). Furthermore, stewardship theory suggests that joint leadership structure facilitates decision-making and improves organisational performance under specific circumstances (Boyd, 1995). The existence of a single leader during periods of high environmental turbulence facilitates a more unified corporate response to events and limits potential agency costs.

For example, the following environmental dimensions have been explored in a number of contexts: turbulence (Davis et al, 1991; Naman and Slevin, 1993); dynamism (Thompson, 1967; Miller and Friesen, 1982; Dess and Beard, 1984); complexity (Child, 1972; Mintzberg, 1979; Tung, 1982); volatility (Bourgeois, 1985); and hostility (Khandwalla, 1977; Miller and Friesen, 1978; Mintzberg, 1979). These dimensions affect the decision makers' perception of uncertainty, which can result in a number of strategic outcomes (Tan and Litschert, 1994).

The degree of environmental uncertainty has been measured using both objective and perceptual research devices (Bourgeois, 1980; Lindsay and Rue, 1980; Koberg, 1987; Milliken, 1990). Much of the earlier work treated the environmental uncertainty construct as perceptually determined (Lawrence and Lorch, 1967; Weick, 1969; Duncan, 1972) and examined individual decision makers as the level of analysis. Others, however, argued against the adoption of perceptual measures and preferred alternative, objective measures (e.g., Child, 1975; Yasai-Ardekani, 1986), which produced equivocal empirical results and confounded research conclusions. Furthermore, only a weak association has been found between decision makers' perception of the environment and objective measures of such phenomena (e.g., Tosi et al., 1973; Osborn and Hunt, 1974; Downey et al, 1975; Boulton et al, 1982).

Many researchers have criticised the use of objective measures of environmental uncertainty (e.g., Miles et al, 1974; Snow, 1976) with the main contention being that these researchers considered that firms respond to the environment as it is perceived and, thereafter, interpreted by decision makers. By default, the environmental forces and conditions, which are not perceived by decision makers, go unnoticed and do not affect management decisions and actions. Thus, firms may perceive the same environmental characteristics differently and respond with different strategy formulation behaviour (Lawrence and Lorsch, 1967; Duncan, 1972; Starbuck, 1976; Pfeffer and Salancik, 1978). Therefore, it is a common place for researchers, in present times, to adopt perceptual measures in testing the environmental uncertainty construct (Naman and Slevin, 1993; Sawyer, 1993; Tan and Litschert, 1994). Given that the process of perceiving and interpreting information from environmental sources is both complex and uncertain, a decision maker's cognitions and individual background greatly impact upon the way an organisation is likely to adapt and, ultimately, determine its future strategic posture (e.g. Selznick, 1957; Mintzberg et al, 1976; Donaldson and Lorsch, 1984; Schwenk, 1988; Starbuck and Milliken, 1988; Wiersema and Bantel, 1993). The coalignment between environmental dimensions and strategic orientation contribute to an outstanding organisational performance.

Theoretical as well as empirical studies found strong effects of environmental dimensions upon board composition. After a careful investigation on the existing literature on the effect of environment to board composition, the researcher attempted to examine the impact of environment on the Greek board composition. Therefore, a set of well-grounded hypotheses have been developed. The hypothesis aims to suggest a solution to a problem or to explain a phenomenon (Ary, Jacobs and Razavieh, 1984).

H1a: The more complex the environment, the larger the size of the board and the higher the number of interlocking directorates.

H1b: The more unstable the environment the larger the size of the board.

H1c: The more munificence the environment the larger the size of the board

H1d: Munificent environment is negatively related to both board size and the number of interlocking directorates

H1e: Dynamic environments favour the dual leadership structure.

2.8 Boards of Directors

Board of Directors is an important mechanism-entity within the company that creates a link between the shareholders and managers and therefore plays an important role in the corporate governance system of the firm (Daily et al., 2003, p. 372). Board of Directors is considered as the official first line of defence against managers who act against the interests of shareholders (Brennan, 2006). Therefore, board has as obligation to determine the firm's overall strategy and to ensure the protection of shareholders. Board of Directors is the centre of the internal system of corporate governance and, in this scope, has the responsibility to assure long-term viability of the firm and to provide oversight of management.

The term "*Board of Directors*" has been adopted by strategic leadership theory. Board of Directors is the body designated for this function. Board of Directors is composed of inside directors (i.e., current and former members of the top management team) and outside directors. Outside directors act as professional referees who oversee and monitor top management (Fama, 1980). The greater the proportion of outside directors, the more effective the board will be in monitoring and limiting managerial opportunism (Fama and Jensen, 1983). While Boards of Directors are not responsible for routine administration of the firm, however they are responsible for reviewing major policy choices (Finkelstein and Hambrick, 1988). Agency theory as Zahra and Pearce (1989, p. 302) stated: "*places a premium on board's strategic contribution, specifically on board's involvement in and contribution to the articulation of the firm's mission, the development of the firm's strategy and setting of guidelines for implementation and effective control of the chosen strategy*".

Boards influence strategy indirectly through "*decision control*" activities such as evaluation of strategic decisions, review of strategic plans and monitoring executive and firm performance (Fama and Jensen, 1983). Furthermore, boards can influence strategy through "*decision management*" activities such as strategic proposals, asking probing questions about important issues and decide for strategic alternatives (Judge and Zeithaml, 1992). Previous studies have shown that most of the board review strategy and performance (Fama and Jensen, 1983) but few boards have an influential role in strategic decisions (Mace, 1971; Vance, 1983).

2.9 Board Structure

It refers to the formal organisation of the Board of Directors where its major dimensions are: size, board composition and leadership structure. The study attempts to examine the effects of board structure on the strategic decision-making process, strategic choice of innovation and on financial performance.

2.9.1 Board Size

Board size is the most important demographic attribute of board composition; however it receives considerable attention in board composition studies due to board functioning role. Board size is a major element of board structure (Daily and Dalton, 1992) and board reform (Chaganti, Mahajan and Sharma, 1985). Board size can range from very small (5 or 6) to very large (30 plus) (Chaganti, Mahajan, Sharma, 1985). Early studies have found that the average size of board is between 12 and 14 and has remained the same over the past 50 year (Gordon, 1945). As board size increases both expertise and critical resources for the organisation are enhanced (Pfeffer, 1973). Larger boards, also, prevent the CEO from taking actions that might not be in shareholders' interests such as golden parachutes contracts (Singh and Harianto, 1989). Finally, larger boards may be associated with higher levels of firm performance (e.g. Alexander, Fennell and Halpern, 1993; Goodstein, Gautam and Boeker, 1994; Mintzberg, 1983). Large have more skills, opinions and knowledge that stimulate proactive strategic actions (Forbes and Milliken, 1999; Eisenhardt and Schoonhoven, 1990). However, increased board size inhibits the board's ability to initiate strategic actions (Goodstein, Gauten and Boeker, 1994). In addition, large boards tend to evade the responsibility for deciding on behalf of shareholders (Pye, 2000). Large groups are more difficult to coordinate and more likely to develop potential interactions among group members (O'Reilly, Caldwell and Barnett, 1989).

On the contrary, a smaller board has the ability to adopt and exercise a controlling role (Chaganti, Mahajan and Sharma, 1985). Also, smaller group size increases participation and social cohesion (Muth and Donaldson, 1998) that might contribute to organisational performance (Evans and Dion, 1991). Yermack (1996) found that board smallness was associated with higher market evaluations as well as higher returns on assets, sales over assets, and return on sales (ROS).

Corporate size is also associated with board size (Dalton et al., 1999; Yermack, 1996) and with corporate performance (Pugh et al., 1963; Aldrich, 1972; Thompson, 1967). From the agency perspective, larger firms require more executives in order to monitor and control firm's activities (Kiel and Nicholson, 2003). However, resource dependency theory suggests that the need for environmental linkage increases as a direct function of firm size increases (Allen, 1974; Dooley, 1969; Pfeffer, 1972; Warner and Unwalla, 1967).

In the same line, empirical studies have associated board size with the number of executive and non-executive members. Several studies support the association between board size and board structure (e.g Pugh, Hickson, Hinings and Turner, 1969; Hickson, Pugh and Pheysy, 1969; Child, 1972). Any change in the number of board members will consequently result in change in the number of executive and non-executive directors. Clifford and Evans (1997) argued that larger companies appoint a larger board size and consequently, they have a greater representation of non-executive directors. Empirical findings from large and mature firms indicate a high representation of non-executive directors (O'Sullivan, 2000; Shivdasani and Yermack, 1999). O'Sullivan (2000) argued that as organisational size increases, the proportion of non-executives is increasing.

Many scholars have studied the board-performance relationship with contradictory findings (Daily, Dalton and Cannella, 2003). Agency theorists argue that small boards facilitate coordination and group cohesion and might contribute to better performance (Gertner and Kaplan, 1996). On the contrary, resource dependency theorists suggest that large boards are associated with higher levels of firm's performance (e.g. Boyd, 1990; Goodstein, Gautam and Boeker, 1994; Alexander, Fennell and Halpern, 1993) due to the fact that larger boards have greater access to resources (Pfeffer, 1973). Empirical studies that have been conducted in various cultural contexts did not provide any support for hypothesised relationship between board size and company's performance (e.g. Holthausen and Larcker, 1993; Wan and Ong, 2005; Rose, 2005).

Within this section arguments have been advanced to suggest that there is a relationship between organisational and board structure characteristics which are related to firm's performance. This provides the basis for the following set of hypotheses which state that:

H2a: The larger the firm's size, the larger the board size

H2b: The larger the board size the better the organisational performance

H2c: The larger the board size, the higher the number of executive BOD

H2d: The higher the board size, the higher the number of non-executive BOD

2.9.2 Board Composition

The composition of Board of Directors defines the affiliations of each director. Corporate governance scholars have a long history of interest in board composition (e.g., Baysigner and Butler, 1985; Baysigner and Hoskisson, 1990; Hill and Snell, 1988; Westphal, 1999). The central issue in the literature is the distinction between inside and outside directors. Insider or internal directors are employees of the firm and outside/external directors are not employees of the firm. An insider is a full-time officer of the corporation, whereas an outsider member does not serve in a managerial capacity the firm in which he/she is a director. Some scholars have characterised outside/external members as affiliate directors, when they are suppliers, bankers or creditors of the firm or being employees of the firm's subsidiaries or holding companies are related by blood/marriage with a board member. The two types bring different skill sets and outlooks to decision making. The cooperative tandem of roles should make overall board effectiveness stronger than that offered by either of the individual types of directors (Harris and Shimizu, 2004).

Inside directors can enhance board decision-making because of their knowledge of day – to-day operations (Baysigner and Hoskisson, 1990) and ability to integrate intra-firm functions (Hill and Snell, 1988). In contrast, outside directors are viewed as a means of independent monitoring.

Many authors have strongly objected to management participation in and domination of board proceedings (Eisenberg, 1988a), contending that the common practice of including managers on board compromises its efficacy in controlling managers. This implies that boards dominated by outsiders are less likely to take actions that deviate from the interests of shareholders, especially when outsiders are truly independent from management.

Outsiders perceive their role as separate and complementary to the management, whereas insiders regard their role as an extension of their managerial duties (Mace, 1986). In recent years, the boards of publicly traded firms contain a majority of outsiders on key

committees. However, outsiders act to safeguard the shareholders' investment in a firm in the face of potential managerial opportunities or incompetencies. Strong outsider representation is also considered to be an essential feature of an independent board (Daily and Dalton, 1994; Mallette and Fowler, 1992). Outsiders are those board members who do not work for or have professional relationships with the corporation they govern (Mallette and Fowler, 1992). Since the mid-1980s corporate reformers have recommended the addition of outsiders to corporate boards as strategy for improving board governance. Therefore, government agencies and stock exchanges have adopted rules and regulations requiring corporations to strengthen their boards' outsider representation. From the agency theory perspective, outsiders are more likely than insiders to carry out their oversight responsibilities effectively because their interests will be more closely aligned with those of the corporation's owners (Johnson et al., 1993). Insiders will not want to raise the sensitive topic of the CEO's performance because in all likelihood they are beholden to the CEO for their jobs and livelihood. Outsiders fulfil this governance obligation by ratifying management initiatives and then monitoring the quality of managerial decision making as these initiatives are implemented. The board can be either composed of inside or outside directors. Agency theorists argue that outside directors are more able to monitor the actions of managers. Outside directors can introduce clear and independent considerations prior to the managerial strategic decisions (Baysigner and Hoskisson, 1990; Gabrielsson and Huse, 2005). They have an influential role in corporate decision-making (Pye, 2000).

Outsiders can be considered as a link to strategic resources and as providers of timely advice and counsel to the CEO and management in the areas that where there is lack of knowledge (Castaldi and Wortmann, 1984). A high proportion of outsiders provide a better forum for corporate governance decision-making and more quality decisions rather than insiders (Fama and Jensen, 1983).

On the contrary, insiders have the necessary information to make valid decisions regarding managerial decision-making. Insiders are well acquainted, familiar to work together on a regular basis and have a comprehensive understanding of the firm's affairs (Forbes and Milliken, 1999). Proponents of stewardship theory argue that superior performance for internal and external stakeholders is linked with majority of insiders (Vance, 1964; Kesner, 1987). The empirical evidence on the relation between firm performance and board composition is again mixed. Rosenstein and Wyatt (1990) found a relationship for a positive impact of the number of outsiders; Baysigner and Butler (1985) came to a similar

conclusion. Hermalin and Weisbach (1991), Bhagat and Black (1999) and Dalton et al. (1998) and Rosenstein and Wyatt (1990) did not find a robust relationship.

2.9.3 Executive versus Non-Executive Directors

Over the last decades, the globalisation and liberalisation of financial markets worldwide the need has emerged for transparency and accountability in the boardroom. Numerous regulatory reforms recommend an increased number of non-executive directors in the boardroom. Non-executive directors are appointed as part-timers in order to protect shareholders' interests (Weir, 1997) and at the same time, they bring experience and expertise to the organisation, provide objective views, a counterbalance to control the executives of the company and enhance networking. They provide advice and counselling to executive directors (Bezemer, Maassen, Van den Bosch and Volberda, 2007). Dulewicz and Gay (1997) described non-executives as critical faculty to the organisation that provide organisational as well as strategic awareness, judgement and promote change. Stiles (2001) stated that the contribution of non-executives to the organisation was the review of strategic initiatives and to provide quality strategic proposals and effectiveness in strategic decision-making. Boards have a broader, more inclusive role when non-executives directors participate in the strategic decision-making process (Roberts, McNulty and Stiles, 2005). Non-executive directors act as effective monitors of executive directors and they have a positive effect on the firm's performance (Vance, 1964; Ezzamel and Watson, 1993; Pearce and Zahra, 1992). Agency theorists, in an effort to protect shareholders' interest, claim that greater representation of non-executive directors will provide a more effective governance for the firm (Jensen and Zajac, 2004). On the other hand, executive directors are regarded as full time employees that are responsible for the organisational strategic and operational aspects (Weir, 1997). There is a distinction between one tier and two-tier board structure. In one-tier board structure, executives as well as non-executive directors form one board which is called a "unitary" and "monistic" board. Executives are involved in board matters and are responsible for the operations and daily execution of board decisions. A unitary system exists in Belgium, Italy, Portugal, Spain, Sweden and U.K.

The two-tier board system, the "highest" board is formed of non-executive or outside directors only. Their duties are supervision, control and strategic advice. This board structure exists in European countries like Austria, Denmark, Germany and the

Netherlands. The board can also be referred to as “supervisory board”. The second tier is formed by the board of executive directors which is responsible for the execution of strategic decisions. In countries where a two-tier regime is the rule for large corporations smaller companies have one-tier boards. However, in countries with a unitary board structure, large companies delegate a substantial amount of their governance to chief executive forming an executive board with other directors and managers. This structure is found in Belgium, France, Spain and Italy (Van den Berghe, 2002).

Empirical studies have revealed that two tiers of board members are non-executives (e.g., McMichael, 1976; Hunt, 1984; Logan and Dunstan, 1993). Rosenstein and Wyatt (1990) found that non-executive directors are associated with a positive excess return. Hermalin and Weisbach (1991) found no relationship between the percentage of non-executives on the board and firm value. On the contrast, there are studies that revealed a negative effect of non-executive directors to the organisational performance (Yermack, 1996; Bhagat and Black, 1999; Hermalin and Weisbach, 1991).

2.9.4 Independent versus Affiliated Board of Directors

A major debate about outside directors on the board is the extent to which they are independent of executives (Bainbridge, 1993). Outside directors are defined as “*all non-management members of the board*” (Johnson, Daily and Ellstrand, 1996, p. 417). Outside directors are not necessarily independent directors; they might be affiliated with family or professional relationships. They may have been co-opted by management through family or and/or business ties (Hillman, Cannella and Paetzold, 2000, p.237). They defined *affiliated outside directors as management directors who have family and/or professional relationships with the firm and non-affiliated outside directors as non-management directors who have no relationships*. Most of the research has been discussing the importance and effect of independent vs. depended boards primarily at the membership level. Independent directors are likely to be more effective in monitoring managers and as a result to reduce the agency costs that rise from the separation of ownership (shareholders) and control (managers) in day-to-day company management (Brennan and McDermott, 2004). Thus, agency theorists support the independence structure of the board and suggest that affiliated directors tend to protect or enhance their business relationship with the firm and are considered to be less objective and less effective monitors of management than independent directors (Anderson and Reeb, 2004). Daily and Dalton (1992) proposed that affiliate directors develop conflicts of interests due to their relationship with the firm.

Empirical findings demonstrate that outside independent directors on the board improve firm's performance (Bhagat and Black, 2002; Barnhart et al., 1994; Daily and Dalton, 1992; Schellenger, Wood and Tashakori, 1989; Baysigner and Butler, 1985). However, other studies have shown zero effect on corporate performance (Hermalin and Weisbach, 1991; Buchholtz and Ribbens, 1994) or negative effect (Beatty and Zajac, 1994). In summary, agency theory suggests a negative impact of affiliated directors on firm performance.

On the contrary, stewardship theory suggests that affiliated directors may feel aligned with company's future performance because of their long-term employment and the close working relationship with the CEO. Thus, it may be argued that a separate but affiliated board structure tends to develop trust and empowerment and provide ease of communication needed for effective functioning (Muth and Donaldson, 1998).

Scholars argue (e.g., Jensen and Meckling, 1976; Kesner et. al, 1986) that Boards of Directors should be independent of management and should consist of independent outsiders and should have an independent outsider as Chairman (Donaldson and Davis, 1994).

2.9.5 Interlocking Directors

Another trend in board composition is that of interlocking directorships, which is the focus of resource dependency theory. Interlocking occurs when a person affiliated with one company sits on the board of another company (Mizruchi, 1996). Resource dependency theory suggests that boards with interlocking directorships are intended to link the companies with the external environment and resources to maximize their performance (Kiel & Nicholson, 2003; Hendry & Kiel, 2004; Fich & Shivdasani, 2006). Interlocking directors are viewed as a mechanism for collusion and cooperation (Burt, 1983), which enables companies to control or monitor others (Pfeffer and Salancik, 1978). Some researchers believe that interlocking directorates serve as a source of information on business practices (e.g. Useem, 1984; Davis, 1991).

Interlocking directors are considered as the mediators for the inter-organisational coordination or control. Pfeffer and Salancik (1978) and Aldrich (1979) regarded interlocks as dyadic inter-organisational strategies that "*are used to manage the organisation's relationship with the environment by reducing competitive uncertainty*". However, Zajac (1988) suggested that board members serving two or more positions do

not necessarily act as organisational linkage, “*in joining another board, a board member may simply be acting on personal motives*”.

The theory of interlocking directorates suggests that interlocks exist for class integration defined as the mutual protection of the interests of a social class by its members (Useem, 1982). According to inter-organisational perspective, high strategic interdependence contributes to high incidence of interlocking behaviour (Penning, 1981). Penning identified three types of interdependence: a) horizontal between competing organisations, b) vertical-between organisations located in adjacent stages of production and c) symbiotic between complementary organisations. Researchers have found contradictory results regarding the impact of interlocking directors on corporations. More specifically, Burt (1983) found positive effects on company profits but Fligstein and Brantley (1992) found a negative effect.

2.9.6 Leadership Structure or CEO Duality

An important parameter of corporate governance is the existence of CEO duality. CEO duality occurs when the same person holds both the CEO and Chairperson’s positions in a corporation (Rechner and Dalton, 1991). The CEO is a full-time position and has responsibility for the day-to-day running of the office as well as setting, and implementing corporate strategy and mainly, the performance of the company. Whereareas, the position of the Chairman is usually a part-time position and the main duties are to ensure the effectiveness of the board and the evaluation of the performance of the executives (Weir and Laing, 2001). In serving simultaneously as CEO and Chairperson, a CEO is likely have greater stature and influence among board members (Harrison, Torres and Kukalis, 1988) thus hampering the board’s independent monitoring capacity (Beatty and Zajac, 1994).

Agency theorists assume that Boards of Directors strive to protect shareholders’ interest (Fama and Jensen, 1983) and thus suggest a negative relationship between CEO duality and firm performance (Finkelstein and D’Aveni, 1994; Rechner and Dalton, 1989; Donaldson and Davis, 1991). Therefore, they support the idea that the separation of the jobs/roles of CEO and Chairperson will improve organisational performance, because Boards of Directors can better monitor the CEO (Harris and Helfat, 1998). The dual structure continues to be criticised. “*These are those who argue that this dual role represents a prima facie case of conflict of interests. Given that one of the board’s prime characters is to monitor the performance of management, there is some question as to*

whether a CEO/Chairperson can exercise the necessary independence of judgment for such-evaluation” (Rechner and Dalton, 1989, p. 141).

The separation of the functions of the CEO and the Chairman has been commonly suggested by practitioners and shareholder rights activists as an important condition for avoiding the conflict of interest between the corporate constituencies and the management as well as for improving the board governance (e.g., OECD, 2004; Monks and Minow, 2001; Baysinger and Hoskisson, 1990). Berg and Smith (1978) reported a negative relationship between duality and ROI and no correlation between ROE or stock price and firm’s performance. A complementary study of the same firms found that CEO duality is negatively related to ROE, ROI and profit margin (Rechner and Dalton, 1991).

In contrast to agency theory, the leadership perspective suggests that firms will perform better if one person holds both titles, because the executive will have more power to make critical decisions (Harris and Helfat, 1998). Furthermore, steward theorists argue that if one person holds both positions, the performance might be improved, as any internal and external ambiguity regarding responsibility for organisational outcomes is being minimized (Finkelstein and D’Aveni, 1994; Donaldson, 1990). It also proposes that CEO duality would facilitate effective action by the CEO and consequently improves the organisational performance under specific circumstances (Boyd, 1995). Pfeffer and Salancik (1978) argued that a single leader can respond to external events and facilitate the decision- making process. Harrison, Torres and Kukalis (1988) suggested that CEO duality facilitates the replacement of CEO in poorly performing companies. Additionally, Worrell et al., (1997) and Dahya et. al. (1996) reported that the consolidation of CEO and chair positions is positively related to shareholders’ return.

The agency problem theory predicts that firms with a unitary leadership structure should engage in more of this type of opportunistic behavior. However, a unitary leadership allows a better flow of information to the board of directors. The board functions properly when it receives accurate information about the operations of the firm. Accurate information is supplied when there is a combined leadership structure and the CEO has a detailed knowledge about the operations of the firm. The CEO/Chair can then bring to the board’s attention the issues and information that directors need to consider. In addition, decisions can be easily taken mainly during emerging situations. Having someone else serve as Chair would result in a reduced flow of information to the board and compromise

board decision making. This theory implies that the monitoring problems created by allowing one person to be both Chair and CEO are relatively small in comparison to the benefits of enhanced information flow to the board.

Support for the independent structure is by no means universal. The dual structure has been strongly suggested as well. The reason that positions of chairman and CEO are usually combined is that this provides a single focal point for company leadership. There is never any question about who is boss or who is responsible. This is an important issue ... (otherwise)... this is guaranteed to produce chaos both within the organisation and in relationships with the board (Andersen and Anthony, 1986, p. 54).

The approaches that have been developed with respect to CEO duality have concluded to inconsistent results and there is no clear direction and magnitude of CEO duality–board vigilance and firm performance (Daily and Dalton, 1992, 1993; Dalton *et. al.*, 1998; Rechner and Dalton, 1989).

2.10 Board Demographic Characteristics

Organisational demography is conceptualised as the distribution of organisational members along any demographic traits or any set of demographic traits (Pfeffer, 1983). Pfeffer (1983, p. 348) argued that “*demography is an important, causal variable that affects a number of intervening variables and processes and, though them, a number of organisational outcomes.*” Upper echelon theory suggests that the demographic characteristics of managers bring a cognitive base and values to the decision-making process that restricts their field of vision.

Hambrick and Mason (1984) contended that a manager’s personal experiences and values can be inferred from observable demographic characteristics and be linked with top management team attributes.

Executives’ demographic characteristics, strategic choices, and firm performance have been unified on the upper echelons theory advanced by Hambrick and Mason (1984). It draws upon literatures in organisational behaviour and strategic management to posit that executives’ observable experiences determine their orientation and that strategic choice “*to some extent ... reflect the idiosyncrasies of decision makers*” (Hambrick and Mason, 1984). Demography refers to “*the composition, in terms of basic attributes such as age, sex, educational level, length of service or residence, race, and so forth of the social entity*

under study” (Pfeffer, 1983, p. 303). Relevant research has covered issues regarding the way that executives’ demographic characteristics such as age, educational background, functional background, industry, organisational and position/job tenure affect organisational performance and effectiveness.

2.10.1 Age is considered as an indicator of experience and a signal of a person’s propensity for risk-taking and change (e.g. Guthrie and Datta, 1997; Wiersema and Bantel, 1992). An individual’s age is expected to influence perceptions and choices of individual (Wiersema and Bantel, 1992); as age increases, flexibility and resistance to change decrease. Younger managers may pursue risky strategies (Hambrick and Mason, 1984). Age is associated with corporate growth and innovation strategies (Child, 1974), total work experience, organisational tenure and industry tenure (Tyler and Steensma, 1998). Studies conducted by Child (1974) and Noburn and Birley (1988) indicate that younger managers achieve superior performance. In addition, they are expected to be better educated and to have more current technical knowledge (Bantel and Jackson, 1989).

In contrast, older managers consider financial and career security very important, thus they might avoid risky action that could change the strategic direction of the firm (Vroom and Pahl, 1971). Older executives tend to be more conservative and they have experienced difficulty in adopting new ideas (Hambrick and Mason, 1984). Age is associated with the capacity for information processing and analysis, therefore, older managers have less information processing ability compared to younger ones due to their physical and mental stamina (Child, 1974). Empirical findings have shown that old executives pursue lower-growth strategies (Child, 1974). Older executives tend to have less confidence in their decisions and therefore they may lack the conviction necessary to provide leadership for strategic change (Taylor, 1975). In a study of 500 top executives conducted by MacCrimmon and Wehrung (1990), it was found that mature executives proved to be risk averse and resistant to change. In addition, Guthrie et al. (1991) claimed that companies that have changed their strategies, they have young top executives.

2.10.2 Educational level is viewed as an indicator of executives’ knowledge, cognitive orientation and skill base (Hambrick & Mason, 1984). Studies conducted by Hitt and Tyler (1991) and Wally and Baum (1994) have shown that educated managers have greater cognitive complexity and ability to adopt new ideas and to accept innovations. Researchers have equated a high level of education with greater capacity for information processing and receptivity to innovation (e.g., Guthrie et al., 1991; Wiersema and Bantel, 1992). Highly

educated managers are more likely to promote innovation and risk taking decisions (Hitt and Tyler, 1991; Finkelstein and Hambrick, 1996; Kimberly and Evanisko, 1981). Executives with high educational background are expected to develop problem-solving skills when complex problems arise (Hitt and Tyler, 1991; Goll et al., 2001). Furthermore, TMT members with high educational background, particularly open-mindedness, information-processing capabilities, flexibility could be advantageous for firms seeking international diversification (Herrmann and Datta, 2005). Finally, the level of education has been associated with firm performance (Noburn and Birley, 1988) and change in corporate strategy (Bantel and Jackson, 1989; Wiersema and Bantel, 1992).

Not only the level of education but also the type of education is equally important. Educational specialisation reflects an individual's cognitive style and personality (Holland, 1973). Hitt and Tyler (1991) argued that the types of educational specialty influence the strategic decision-making process and strategic change. Executives with formal education training in sciences and engineering are likely to understand the technological base of the company and to be more favourable to cooperative opportunities. Heilmeier (1993) suggested that technically trained executives are aware of relevant technologies and are able to predict, comprehend and anticipate long-term change. In contrast, executives with only a formal management education are more likely to pursue short-term performance goals at the expense of innovation and long-term asset building compared to executives with other educational backgrounds (Hambrick and Mason, 1984). Focusing on business education and more specifically on MBA programmes, students are risk-averse and resistant to innovation (Finkelstein and Hambrick, 1996). However, executives with technical education in science and engineering have a complete understanding in technology and innovation and are likely to focus more on opportunities rather than on threats (Tyler & Steensma, 1998). In general education and in particular professional management education focuses more on application of analytical techniques rather than risk-prone idiosyncratic judgements of "*self-made*" executives (Goll and Rasheed, 2005, p.1005).

2.10.3 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). Dearborn and Simon (1958) concluded that managers with different functional backgrounds differ in their attitudes, knowledge and perspectives and therefore, different strategic choices. Functional background is a lens through which business situations are viewed (Guthrie and Datta, 1997). Functional backgrounds indicate the way in which problems are defined (Dearborn

and Simon, 1958), how information is processed (Walsh, 1988) and how strategic choices are made (Hitt and Ireland, 1985).

Empirical studies have identified systematic relationships between managers' functional experience and firm's strategy. Thomas et al., (1991) have found strong associations between CEO functional experience and strategic orientation. In addition, Smith and White (1987) observed significant relationships between new CEOs functional background and firm's diversification strategies.

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 as well as product research and development (R&D) and entrepreneurship, which emphasise on growth, search for new opportunities and are responsible for monitoring and adjusting products. On the other hand, "*throughput functions*" include areas of productions/operations, engineering finance and accounting, which aim to the increase of efficiency in the transformation process. This classification provides a linkage between functional background and organisational decision-making.

The organisation's strategy partly determines the types of functional background that are essential for the firm's success (Hitt, Ireland and Palia, 1982). For instance, executives with backgrounds in R&D are associated with progress, invention and improvement (Wiersema and Bantel, 1992) as well as with differentiation and low-cost strategy (Govindarajan, 1989). On the other hand, throughput backgrounds are important in industries which are characterized by high capital intensity or concentration and lower growth (Rajagopalan and Datta, 1996). Additionally, managers with an output background have greater ambiguity and less control compared to those that with throughput background, whose skills and knowledge are more suitable for foreign orientations (Herrmann and Datta, 2002).

2.10.4 Executive Tenure has been conceived in various ways: tenure in the position (e.g., Hambrick and Fukutomi, 1991; Miller, 1991); tenure in the organisation (e.g., Thomas et al., 1991); and tenure in the industry (Hambrick, Geletkanycz and Fredrickson, 1993).

2.10.4.1 Industry Tenure refers to the number of years that the executive has worked for the particular industry/sector. Noburn and Birley (1988) indicate that the number of companies an executive has worked for is positively related to growth and financial performance of the company.

2.10.4.2 *Organisational Tenure* is defined as the number of years an individual has worked for the organisation (Iaquinto and Fredrickson, 1997). Miller (1991) pointed out that those organizations with long-tenured CEOs were less likely to have strategies and structures in order to respond to environmental requirements. Board members have acquired a high-level of firm-specific knowledge and skills (Forbes and Milliken, 1999). The familiarity that exists among the members leads to higher levels of cohesiveness and to better use of knowledge and skills. Long tenured executives have been associated with increased understanding of organisational policies and procedures (Kanter, 1977); greater commitment to status quo (Bantel and Jackson, 1989; Hambrick et al., 1993; Michael and Hambrick, 1992) and to organisational values (Stevens, Beyer and Trice, 1978). Finkelstein and Hambrick (1990, p. 488) put it “...*(executives) with short tenures have fresh, diverse information and are willing to take risks... As tenure increases, perceptions become very restricted and risk taking is avoided*”. Consequently, long tenured CEOs are hesitant to change the strategic direction of the firm (Wiersema and Bantel, 1992) and to adopt innovative strategies (Finkelstein and Hambrick, 1990). However, Noburn and Birley (1988) found a positive association between executive’s tenure and company performance (growth and profitability) in stable industries but negative association in turbulent industries. Thomas et al. (1991) found that longer executive firm tenure is related with “*defender*” rather “*prospector*” strategies. The length of organisational tenure has impact on the firm’s sales growth.

2.10.4.3 *Position Tenure* demonstrates the length of time a person has served the company from the current position (Hambrick and Fukutomi, 1991). Executives with long position tenure are familiar with decision process, task knowledge, expertise and experience along with increased power within an organisation (Herrmann and Datta, 2002). Furthermore, increased position tenure is associated with adoption of risky strategies (Finkelstein and Hambrick, 1996) and greater autonomy (Miller, 1991). The average company tenure of an executive has been associated with cohesion (Korac-Kakabadse et al., 1998), socialization, shared experiences and a common vocabulary (Katz, 1982).

Hambrick and Mason (1984, p. 200) stated: “*executives who have spent their entire careers in one organisation can be assumed to have relatively limited perspectives. In extreme cases where the entire top management team has risen solely through the organisation, it is likely that it will have a very restricted knowledge base from which to conduct its limited search*”.

Tenure has been associated with commitment to established policies and practices and the development of routines for dealing with information (Katz, 1982). Scholars have attempted to examine the relationship between tenure and strategies and they concluded that long tenured executives reduce strategic change (Wiersema and Bantel, 1992) and increases strategic persistence (Finkelstein and Hambrick, 1990). However, long tenured managers are associated with internally focused rather than externally focused changes (Chaganti and Sambharya, 1987). Long tenured managers tend to be committed, use limited amount of sources of information and exhibit a moderately low task interest (Hambrick and Fukutomi, 1991). Miller (1991) concluded that it is less likely for long tenured executives to produce strategies and structures according to environmental circumstances.

2.10.4.4 Female Representation

Recent corporate reforms encourage the participation of women in the boardrooms. Williams (1988, p. 129) stated that “*women are advancing through the corporation on schedule... Most female managers are still too young and training to have reached the upper echelons, but they are maturing into candidates for the senior jobs of the next two decades*”. Bilimoria (1995) argued that women executives bring fresh and well-informed news related to market, environment and ethical issues and have an impact on the decision-making process. Furthermore, Fondas and Sassalos (2000) indicated that boards with more than one female director have a greater influence over strategic decisions because they provide a broader perspective and different voice. Apart from broader perspectives, women have a more civilised behaviour and sensitivity to various opinions and have a more transformational and interactive management style (Rosener, 1990). Female directors have non-business related backgrounds (Ruigrok, Peck and Tacheva, 2005) and they are dealing mainly with soft managerial positions such as human resources, corporate social responsibility, marketing (Zelekowski and Bilimoria, 2005). Women are more effective in performing qualitative control functions rather than effective financial monitoring (Tacheva and Huse, 2006).

Singh et al. (2001) concluded that executive female directors are appointed in firms with high turnover. However, Rose (2007) reported no effect of female directors on Danish firm’s financial performance.

2.11 Board Involvement in Strategic Decision-Making

Boards of Directors play a critical role in shaping the strategy of the firm. Board strategic involvement is regarded as the major responsibility of the board (Andrews, 1981; Baysigner and Hoskisson, 1990; Finkelstein and Hambrick, 1996; Golden and Zajac, 2001; Huse, 2007). Board strategic involvement is a complex and multidimensional concept that cannot be explained by a single theoretical approach (Ravasi and Zattoni, 2006). Zahra and Pearce (1990, p. 165) stated that: “*board strategic involvement refers to the level of attention given by director to the various areas of strategic process. Therefore board strategic involvement covers corporate mission development, strategy conception and formulation, and strategy implementation*”.

Agency theory as Zahra and Pearce, (1989, p. 302) state: “*places a premium on a board’s strategic contribution, specifically the board’s involvement in and contribution to the articulation of the firm’s mission, the development of firm’s strategy and setting of guidelines for implementation and effective control of the chosen strategy*”. In research on Boards of Directors, the strategic role of the board has largely ignored the emergent nature of strategy and its implications for board involvement. Demb and Neubauer (1992) briefly mentioned the issue and asserted that the more an organisation is characterized by an emergent strategy-development process, the less likely it is that the board will be involved; the more fluid and fragmented the decision-making process, the less chance there is for non-executive directors to intervene or to submit their opinion (Demb and Neubauer, 1992). Ruigrok et al. (2006, p. 1205) narrowed down the concept of board involvement and claimed that: “*evaluation and proposals of different alternatives and consider different options*”. Board involvement describes the overall level of participation of board members in making decisions that affect the long-term performance of the organisation (Judge and Zeithaml, 1992, p. 771).

A common distinction of board involvement is based on the largely accepted view of specific strategy decisions as being composed of a formation phase and an evaluation phase (Judge and Zeithaml, 1992). In both formation and evaluation, there are levels of involvement, which can be represented as continuum (McNulty and Pettigrew, 1999; Pettigrew and McNulty, 1996; Zahra and Pearce, 1989). In formulation, the board’s involvement has been claimed to range from working with management to developing strategic direction in order to ratify management proposals (Judge and Zeithaml, 1992).

In evaluation, boards can be classified as to whether they probe management's evaluations of resource allocations or whether they simply accept the evaluation top management provides (Judge and Zeithaml, 1992; Lorsch and MacIver, 1989). Firstly, Mace (1971) examined the boards as a baseline of strategic involvement in service-related activities. Tashakori and Boulton (1983) found that board involvement has increased in all stages of strategic planning process. The section below presents some influential factors on board involvement in strategic decision-making process.

2.11.1 Insider versus Outsider Representation: Insiders are characterised as board members who are current or former employees of a firm (Cochran, Wood and Jones, 1985). Inside directors provide valuable insights and information to the board and therefore, they allow board to be more involved in the strategic decision process (Baysigner and Hoskisson, 1990). Ford (1988) found that insider representation is positively associated with board involvement in the strategic decision process. Tashakori and Boulton (1983) concluded that a higher proportion of insiders were associated with greater board participation in the strategic planning process. Inside directors with industry and company experience actively participate in strategic decisions (Goodstein and Boeker, 1991; Johnson et al., 1993; Judge and Zeithaml, 1992).

From the agency theory perspective, outsiders are aligned with shareholders interests because they focus more on performance (Johnson, Hoskisson and Hitt, 1993). Hermalin and Weisbach (1988) found that poorly performing companies replace insiders with outsiders because outsiders play an important role in board involvement in strategic actions mainly restructuring of the firms. However, outsiders have limited time to spend in company, so they lack knowledge and expertise regarding the strategic process of several decisions. Outsiders bring knowledge and expertise to the organisation and they contribute to the organisational performance of small and entrepreneurial organisations (Daily and Dalton, 1993; Daily and Dalton, 1992). The unclear previous findings lead to formulate the following hypothesis:

H3a: Inside representation is positively related to board involvement in the strategic decision-making process

2.11.2 Board Size and Board Involvement: Resource dependency theories argue that the larger the board the higher the expertise and the knowledge they bring (Pfeffer and Salancik, 1978). Board size was found to be positively related to the company's size, diversification, internationalisation (Pearce and Zahra, 1992; Sanders and Carpenter, 1998). The above arguments indicate that the boards contribute significantly to board strategy. However, other scholars have reported a negative impact of large board on involvement. Large boards are not able to conduct effective discussions and are ineffective in making strategic decisions in a timely fashion (Herman, 1981). Large boards might have a diversity of perspectives which may cause conflict problems (Amason and Sapienza, 1997). Therefore, large boards might be less cohesive and they may prevent effective participation by board members in strategic decision (Judge and Zeithaml, 1992; Mueller and Baker, 1997). Finally, Judge and Zeithaml (1992) concluded that board involvement in the strategic decision process was positively related to financial performance. Strategic board involvement required active and cohesive boards that meet up regularly and discuss strategic opportunities (Ruigrok et al., 2006). The effect of board size on strategic involvement has led to mixed conclusions. Therefore, the researcher developed the following hypothesis to examine how the board size affects the board participation on strategic decisions of Greek firms. This lead to the following hypothesis:

H3b: Board size is negatively related to board involvement in the strategic decision-making process

2.11.3 Frequency of Board Meetings: The number of board meetings reflects the frequency of information exchanged. It is quite essential for the directors to meet each others, to discuss main issues of the organisation and to accomplish their legal duties and responsibilities (Pugliese and Wenstøp, 2007). The frequency of board meetings has been considered as a measurement of board effectiveness and of evaluation of board's performance (Rutherford and Buchholtz, 2007). The board as decision-making apex has to understand firm-specific information and to use the relevant knowledge in order to make intelligent and coherent business plans to survive. Therefore, it is assumed that the higher the frequency of board meetings, the higher the board strategic involvement will be (Pugliese, 2006). Hence, the following hypothesis states:

H3c: The higher the frequency of board meetings, the higher the board's strategic involvement will be

2.11.4 Length of Board Meetings: The length of board meetings represents the general duration of information exchange. The agenda of board meetings includes topics such as strategy formulation which requires enough time (Stiles, 2001). Long meetings imply the board's role in evaluating the strategic alternatives and provide more accurate information regarding strategic choices (Pugliese, 2006). Additionally, board meetings last longer because the directors need time to utilise comprehensive understanding and to develop a safer procedure prior to any strategic decision (Pugliese and Wenstøp, 2007). Formally, the following hypothesis states:

H3d: The longer the board meetings, the higher the board's strategic involvement will be.

2.11.5 Environmental Conditions: According to resource dependency perspective, boards are selected because they are able to manage interorganisational dependencies. In case of environmental uncertainty, board is required to be more actively involved in strategic decision-making. These board members have the appropriate expertise and they can help the Top Management (Filkelstein and Hambrick, 1996). Several scholars have argued that the strategic role of board members is critical during periods of environmental uncertainty (Boulton, 1978; Goodstein, Gautam and Boeker, 1994). During environmental uncertainty, board members have greater ambiguity and therefore, they are less effective and able to have organisational impact (Olson, 1982). Organisations operating in uncertain environments are required to have organisational flexibility and high levels of participation in the strategic decision-making (Ashmos, Duchon and McDaniel, 1998). Therefore, companies operating in uncertain environments require a greater board involvement in strategic decisions. Board involvement in strategic decision-making process is even more urgent in certain environmental circumstances. When, Boards of Directors face great environmental uncertainty they are required to be more actively involved in strategic decision-making. Therefore, it is possible to state that:

H3e: The more uncertain the environment, the more involved the board will be in the strategic decision-making process

2.12 Organisation Strategy

The word strategy is derived from the Greek *strategos*, which means the “the art of the general” (Hart, 1967). The notion of strategy as a normative approach was introduced by the Harvard Business School and strategy was described as a situational art and as an imaginative act of integrating numerous complex decisions (Learned, Christensen, Andrews and Guth, 1965). Chandler (1962) viewed strategy as a descriptive concept. In Chandler’s view, strategy refers to “*determination of the basic long-term goals and objectives of the enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals*” (Chandler, 1962). Chandler concluded that strategy was the key mechanism for designing a new direction that will have an impact on organisational structure and performance. Mintzberg (1979, p. 25) defined strategy as “*a mediating force between the organisation and its environment: consistent patterns in streams of organisational decisions to deal with the environment*”.

In addition, Hofer and Schendel (1978, p. 25) defined strategy as “*a fundamental pattern of present and planned resource deployments and environmental interactions that indicates how the organisation will achieve its objectives*”. An organisation’s strategy determines the extent of alignment between its external environment and its internal structure and processes (Galbraith and Nathanson, 1978; Jemison, 1981; Miles and Snow, 1978). This alignment can be achieved by using a formal planning process, which has resulted in organisation strategy usually being through a consciously integrated “*plan*” (Andrews, 1971; Chander, 1962).

2.13 Models of Strategy

Strategy as a concept has its roots in business policy (e.g. Andrews, 1971; Hofer, 1975) as well as in organisational theory (e.g. Aldrich and Pfeffer, 1976; Child, 1972). Strategy is regarded as a set of decisions that a) guide the organisation according to the environment, b) affect the internal structure and processes and c) consequently, its performance. Strategy is the outcome of formal planning; an analytical process, which establishes long-term objectives, a process usually initiated by Top Management and undertaken by staff strategists (Ansoff, 1965; Chandler, 1962). Strategic process includes strategic analysis, strategic choice and strategic implementation (Andersen, 2000). Strategic analysis is concerned with the strategic position of the organisation in terms of internal and external environment in which it operates and the expectations and influences of stakeholders.

Strategic choice deals with identifying and understanding stakeholders' expectations, strategic vision and mission, portfolio management and financial capabilities. Finally, strategic implementation refers to the translation of strategy into organisational action through organisational structure and design, resource planning and the management of strategic change (Andersen, 2000).

2.14 Strategic Decision Making Process

Dean and Sharfman (1996, pp. 379-380) describe 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 (Hickson et al. 1986)*". top management team is responsible for the strategic decisions, which can be either formal or informal (Penning, 1985) and they reflect the interaction between an organisation and its environment (Ginsberg, 1988). They deal with issues that are essential for the survival of an organisation rather than issues, which lend themselves to routine strategic-making (Stahl and Grigsby, 1992). Strategic decision-making has received increased attention among scholars and business practitioners (Ireland and Miller, 2004). Strategic decision-making has been distinguished into two broad categories: content research and process research. Content research deals with issues of strategy content such as portfolio management, diversification, mergers and the alignment of firm strategies with environmental characteristics (Elbanna, 2006, p. 2). However, process research deals with the process by which a strategic decision is made and implemented and the factors, which affect it (Elbanna, 2006, p. 2). Although most of the studies deal with content issues, equivalent attention has to be placed on process research. The two perspectives of strategic decision-making are not separate but complementary (Rajagopalan et al., 1997). The process of strategic decision-making has been at the centre of strategic research for over 30 years.

Various scholars have described the strategic decision-making as a sequence of phases (e.g. Fredrickson, 1984; Mintzberg, Raisinghani and Theoret, 1976; Hart, 1992), a set of different characteristics/dimensions (e.g. Hart, 1992; Hickson, Wilson, Cray and Mallory and Butler, 1986; Stein, 1980; Dean and Sharfman, 1996; Papadakis et al., 1998; Wally and Baum, 1997) and the effects of these dimensions on organisational outcomes (e.g. Dean and Sharfman, 1996; Goll and Rasheed, 1997; Hough and White, 2003; Papadakis, 1998). Among these dimensions are comprehensiveness/rationality, politicization,

centralization and formalization (Dean and Sharfman, 1996; Lyles and Mitroff, 1980; Rajagopalan, Rasheed and Datta, 1993). The aforementioned strategic decisions dimensions are presented and described below:

- *Comprehensiveness/rationality dimension* has been defined as the “extent to which an organisation is exhaustive or inclusive in making and integrating strategic decisions (Fredrickson, 1984, p. 447). Rationality has been examined under the light of the following different dimensions: complexity of methodology (Langley, 1990), degree of enquiry (Lyles, 1987) and scrutiny (Cray et. al., 1988).
- *Centralisation* (Cray et al., 1988; Lyles, 1987; Miller, 1987)
- *Formalisation / Standardisation* of the process (e.g. Mallory et al., 1983; Stein, 1980)
- *Political/Problem-Solving dissension dimension*: has been analysed by (Lyles, 1987; Hickson, Wilson, Cray and Mallory and Butler, 1986; Pfeffer and Salancik, 1974), as negotiation/bargaining (Hickson, Wilson, Cray and Mallory and Butler, 1986; Cray et al., 1988), individual versus group dynamics (Stein, 1980), power (Narayanan and Fahey, 1982) and consensus/dissension (Lyles, 1987).

Other factors that have been mentioned are: dynamic factors (Cray et al., 1988; Mintzberg et al., 1976), forcing (Bryson and Bromiley, 1993), duration (Hickson et al., 1986) and lateral communication (Papadakis and Barwise, 2002). Papadakis and Barwise (1997) highlighted the problem of identifying the influential factors of the strategic decision-making process. Hitt and Tyler (1991) argued that a combination of different dimensions on the strategic decision-making process will contribute to a better understanding of the factors that influence the strategic decision-making process. Brouthers et al. (2000) examined two perspectives of the strategic decision-making process: environmental determinism and strategic choice perspective.

2.14.1 The Environmental Determinism Perspective

According to environmental determinism, strategic decisions and processes show adaptation to opportunities, threats, constraints, and other environmental characteristics. Several scholars (e.g. Starbuck, 1976) have argued that the environmental characteristics have an impact on the strategic decision-making process. Several scholars contented that environmental characteristics exert a significant influence on the rationality of the strategic

decision-making process (e.g. Agor, 1989; Bresser and Bishop, 1983; Cyert and March, 1963). Environmental dynamism is associated with greater level of rationality in the planning process at high performing firms (Miller and Friesen, 1983; Eisenhardt, 1989b). Fredrickson (1985) assumed that decisions that occur during environmental threats will be more rational compared to those that are taken in environmental opportunities. Fredrickson and Iaquinto (1989) concluded that companies operating in stable environments have rational-comprehensive strategic processes. Bourgeois and Eisenhardt (1988) argued that firms operating in high velocity environments have to follow a rational decision-making process. Empirical findings have shown that firms operating in low munificent environments follow comprehensive decision processes (Khandwalla, 1973; Miller and Friesen, 1983). Kukalls (1991) stated that the greater the environmental complexity, the greater the level of planning extensiveness.

Concerning environmental dynamism, executives operating in dynamic environments are more likely to pursue rational planning process (e.g. Miller and Friesen, 1983; Glick et al., 1993). Although environments can be conceptualized in many ways, environmental munificence is considered an important attributable for strategic behaviour (Castrogiovanni, 1991). So far, there has been limited research on the impact of environmental hostility/munificence to the rationality of strategic decision-making process (Goll and Rasheed, 2005; Wan and Hoskisson, 2003). Thus, although association between environmental characteristics and the strategic decision-making process is not clear, *“external environment has been recognized as an important variable in explaining many organisational phenomena”* (Jones et al., 1992, p. 222).

2.14.2 Strategic or Management Choice Perspective

Strategic choice perspective focuses on the role and attributes of decision makers. It reflects the idiosyncrasies of decision-makers (Child, 1972; Cyert and March, 1963). The existing literature examines the relationship between Top Management and corporate strategies (Miller and Toulouse, 1986; Finkelstein and Hambrick, 1990) as well as performance (Haleblian and Finkelstein, 1993). However, there is no empirical work that examines the relationship between Top Management characteristics and strategic-decision making processes (Bantel, 1993, Smith et al., 1994). Hitt and Tyler (1991) found the CEO's demographic characteristics to have an impact on the strategic decision-making processes. In a sample of Greek manufacturing firms, Papadakis, Lioukas and Chambers

(1998) found that education level is positively associated with financial reporting. Education level shows the degree of people's information analysis (Dollinger, 1984). Educated CEOs are likely to demand detailed information and extensive financial reporting (Bantel, 1993). The empirical findings of Papadakis and Barwise (2002) indicate that CEO characteristics (position tenure and education) as well as TMT characteristics (education and competitive aggressiveness) are related to the degree of hierarchical decentralization. More specifically, TMTs characteristics relate more to comprehensiveness/rationality and even more to lateral communication. The most influential CEO characteristic is its tenure, which is positively related to hierarchical decentralization (Papadakis and Barwise, 2002).

Finally, in a study conducted by Goll and Rasheed (2005), they found a significant and positive relationship between tenure and educational level and rational decision-making. The relationship between managerial characteristics and the strategic decision-making process has led to mixed findings. Lyles and Mitroff (1980, p. 117) argued that: *"It is still not clear the influence of managerial characteristics on the organisational problem-formulation process. The results of the study indicate that the problem formulation process is at an organisational rather than individual managers might not have a strong influence on the process..."*. Many researchers argue that managers' characteristics do not play a dominant role in strategic decision-making (Lieberson and O'Connor, 1972; Hannan and Freeman, 1977). Stein (1980, p. 332) claimed that *"leadership does not constitute a meaningful contextual domain influencing strategic procedures"*.

The existing literature examines the relationship between Top Management and corporate strategies (Miller and Toulouse, 1986; Finkelstein and Hambrick, 1990) as well as performance (Haleblian and Finkelstein, 1993). However, there is no empirical work that examines the relationship between top management characteristics and strategic-decision making process (Bantel, 1993, Smith et al., 1994). As Rajagopalan et al., 1993, p. 364) point out *"research relating organisational factors such top management team (TMT) characteristics to strategic decision making processes is limited"*. Therefore, the influence of Boards of Directors on the strategic decision-making process remains unclear. In addition, Papadakis and Barwise (1997) pointed out the problem of identifying key influences on the strategic decision-making process. Therefore, Hitt and Tyler (1991) identified and examined rational-normative perspective, the external control perspective and the strategic choice perspective as influential factors of strategic decision-making process which received great empirical support. Furthermore, Brouthers et al. (2000)

examined the environmental determinism and the strategic choices as influences of the strategic decision-making process. However, it is worth mentioning that very few studies have adopted multiple perspectives of the strategic decision-making process (Child et al., 2003).

Hitt and Tyler (1991) found the CEO's demographic characteristics have an impact on the strategic decision-making processes. In a sample of Greek manufacturing firms, Papadakis et al. (1998) found that education level is positively associated with financial reporting. Educated CEOs are likely to demand detailed information and extensive financial reporting (Bantel, 1993). The empirical findings of Papadakis and Barwise (2002) indicate that CEOs' characteristics (position tenure and education) as well as TMTs' characteristics (education and competitive aggressiveness) are related to the degree of hierarchical decentralization. More specifically, TMT characteristics relate more to comprehensive /rationality and even more to lateral communication. The most influential CEO's characteristic is its tenure, which is positively related to hierarchical decentralization (Papadakis and Barwise, 2002). Finally, in a study conducted by Goll and Rasheed (2005), a significant and positive relationship between tenure and educational level and rational decision-making was found. The relationship between managerial characteristics and strategic decision-making process has led to mixed findings. Lyles and Mitroff (1980) argued that the influence of executives' characteristics on organisation problem-formulation process is still not clear.

Several scholars (e.g. Starbuck, 1976) have argued that the environmental characteristics have an impact on the strategic decision-making process. Environmental dynamism is associated with greater level of rationality in the planning process at high performing firms (Miller and Friesen, 1983; Eisenhardt, 1989b). Fredrickson and Iaquinto (1989) concluded that companies operating in stable environments have rational-comprehensive strategic processes. Bourgeois and Eisenhardt (1988) argued that firms operating in high velocity environments have to follow a rational decision-making process. Empirical findings have shown that firms operating in low munificent environments follow comprehensive decision processes (Khandwalla, 1973; Miller and Friesen, 1983). So far, there has been a limited research on the impact of environmental hostility/munificence to the rationality of strategic decision-making process (Goll and Rasheed, 2005; Wan and Hoskisson, 2003). Thus, evidence on the relationship between environmental characteristics and strategic decision-

making process resulted is contradictory. Drawing from these research conclusions it is possible to articulate grounded hypotheses which states that:

H4a: Educated executives tend to pursue the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

H4b: The executives' educational specialty is associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

H4c: The executives' functional background is associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

H4d: Long tenured executives in terms of industry, company and position tenure are associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

H4e: The various environmental dimensions influence the process of the strategic decision-making process in terms of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

2.15 Strategic Choices

As it has already been mentioned, strategic choice is one of the fundamental elements of strategic process. Organisational choice emphasises on the way the meaning of a choice alters over time. It pays attention to the strategic effects of timing, through the introduction of choices and problems, the time pattern of available energy and the impact of organisational structure (Cohen, March and Olsen, 1972).

According to the strategic choice perspective (Andrews, 1986; Child, 1972), organisational members take actions in order to adapt to an environment as an explanation to organisational outcomes. Strategic choice supporters focus on the effect of managers on strategic decisions. They argue that individuals take decisions that depend on prior processes of human perception and evaluation (Child, 1972). Child (1972) suggested that top managers make strategic choices according to the goals, domains, technologies and structure of a firm. He examined the exercise of strategic choice as a process in which coalitions members evaluate their organisation position, what expectations are presented

by resource providers, what are the trends of events in the environment, what is the environment current performance, the congeniality of its present internal configuration. Recent theorists have examined the relationship between managers' characteristics and perceptions, objective decision criteria and strategic choice (Finkelstein, 1988; Hambrick and Mason, 1984).

Schwenk (1989) claimed that individual characteristics affect the heuristic and cognitive maps that are used to make strategic decisions and suggested three variable categories of individual differences: cognitive style, demographic factors and personality traits.

Some researchers have emphasised the link between managerial characteristics and strategic behaviour of the firm. Dess, Lumpkin and Covin (1997) identified three different kinds of strategic behavior: adaptive, conservative (simple and participative) and entrepreneurial. This typology seems similar to that developed by Miles and Snow (1978). Adaptive behaviour shows evidence of entrepreneurial and conservatism behaviours. Adaptive firms maintain a relatively stable base of activities while at the same time seeking the selective development of attractive products and/or new markets. This is similar to the analyser behaviour of Miles and Snow (1978).

Conservative behavior focuses on penetrating existing markets and improving operating efficiency. Finally, entrepreneurial behavior is regarded as introduction of products and application of new marketing policies. Executives that are in contact with outsiders are able to respond to emerging tendencies that bring change to the industry.

In the landmark study, Miles and Snow (1978, p. 263) have reached three fundamental dimensions of the strategic choice perspective: "a) strategic choice views managerial or strategic choice as the primary link between organisation and environment, b) focuses on management's ability to create, learn about, and manage the organisation's environment; and c) encompasses the multiple ways that organisations respond to environmental conditions". Although there are conflicting viewpoints of various scholars the process of the strategic choice includes the following steps: formation or pre-choice, phase of strategic activity, evaluation or post-choice phase (Fredrickson, 1983). In general, the strategic choice perspective emphasizes nondeterministic explanations of organisational processes and outcomes (Bourgeois, 1984).

The strategic choice paradigm (Child, 1972) postulates that key decision-makers have considerable control over an organisation's future direction. In the upper echelons perspective, Hambrick and Mason (1984) introduce the coalignment between strategy and managerial characteristics. It provides a framework, which examines how managers influence organisational outcomes. Organisational outcomes such as strategies and performance are expected to reflect the characteristics of the leaders. As first developed by the Carnegie School (e.g., Cyert and March, 1963), top executives tend to make strategic choices under complex situations. The logic of the Carnegie school served as the main foundation for Hambrick Mason's (1984) upper echelons model, which investigate the relationship between top executives' characteristics and organisational outcomes.

Experiences serve to shape values and cognitive models in ways that it might substantially affect decision making and behaviour (Hitt and Tyler, 1991). If so, then it is likely to be an association between demographic or background factors, reflective of executives' experiences and strategic choices.

Current research has found that the characteristics and experiences of a top management team might predict a range of organisational outcomes better than the characteristics of CEO alone (e.g. Bantel and Jackson, 1989; Finkelstein and Hambrick, 1990; Smith et. 1994). Empirical results have shown that executive team characteristics are significant determinants of organisational strategy as well as for firm-level performance outcomes (Eisenhardt and Schoohoven, 1990). The strategic choice perspective (Child, 1972) has generated a large body of research examining the impact of executives on organisational outcomes (e.g. Gupta and Govindarajan, 1984; Miller, Kets de Vries, and Toulouse, 1982). The empirical results of many scholars have demonstrated strong associations between the characteristics of the executives and strategy/performance (Day and Lord, 1992; Hambrick and Mason, 1984; Miller and Toulouse, 1986; Gupta and Govindarajan, 1984). Company's strategy can be viewed by a number of dimensions including: product differentiation or low cost (Porter, 1980), innovation or reliability (Miles and Snow, 1978), innovation timing or focus (Maidique and Patch, 1982), domestic or international activity (Bartlett and Ghoshal, 1989).

More specifically, Dearborn and Simon (1958) found that the functional background of executives is related to interpretation of critical problems in a complex business case. The empirical studies of Gupta and Govindarajan (1984) have indicated that experience in

marketing and sales were associated with growth strategies rather than harvest strategies. Both Kimberly and Evanisko (1981) (studying hospitals) and Bantel and Jackson (1989) found that executives' educational background was associated with innovation.

2.16 Innovation

The focus on innovation is driven by a substantial body of empirical and theoretical work that highlights its increasingly critical role as a source of sustainable competitive advantage due to global competition and technological change (Eisenhardt and Martin, 2000; Fiol, 1996; Kelly and Storey, 2000; Teece et al., 1997; Porter and Ketels, 2003; Tushman and O'Reilly, 2002). The strategic choice perspective introduces the notion of equifinality into examinations of firm performance within similar environments which they might effective organizational strategies (Doty et al., 1993). Firms may thus establish competitive advantage on the basis of different sets of distinctive competencies, which are aggregates of specific activities that organisations perform especially well relative to other organisations within a similar environment (Selznick, 1957; Snow and Hrebiniak, 1980). Empirical work has shown that competitive success is based on the organisation's management of innovation process and factors associated with successful management of the innovation process (e.g. Balachandra and Friar, 1997; Rothwell, 1992).

Innovation is defined as the creation or adoption of new ideas (Daft, 1978). At the organisational level, innovation is defined as the adoption of new product, production service, technology, policy, structure or administrative system (Daft, 1978; Damanpour, 1991). It is actually an attempt of an organisation to be proactive and risk-taking instead of following the competitors (Mintzberg, 1973; Toulouse, 1980). The adoption of innovation aims to contribute to the performance and effectiveness of the adopting organisation. Innovation is perceived as a way of changing an organisation due to internal or external environmental forces (Damanpour, 1991).

Innovation has been divided into administrative and technical. Technical innovation includes products, services and production process technology and is related to basic work activities and deals either with product or process (Damanpour and Evan, 1984). On the contrary, administrative innovation involves organisation structure and administrative processes and is directly related to the management (Damanpour and Evan, 1984; Kimberly and Evanisko, 1981).

Upper echelons perspective argues that organisational outcomes both strategy and performance can be considered to reflect the values and cognitive characteristics of top managers. Investigators have focused on examining how top management characteristics are associated with strategies. An early empirical work held by Hage and Dewar (1973), has shown that the executives' attributes influence the organisation's degree of innovation. Organisational and strategic leadership literature has shown that top managers influence organisational capabilities by establishing organisational culture, motivating and enabling managers and employees and building capacity for change and innovation (Daft, 2001; Elenkov, Judge and Wright, 2005). Top managers affect innovation adoption because they can modulate the process of scanning the environment and formulating policy to respond to environmental change and to influence major decisions (Damanpour and Schneider, 2006).

Previous studies have investigated the relationship between CEO characteristics and innovation strategies. More specifically, empirical studies suggested that CEO tenure is positively related to R&D expenditure and/or innovation (Barker and Mueller, 2002), CEO age is negatively related to innovation (Child, 1974; Barker and Mueller, 2002) and inside directors encourage innovation (Baysigner, Kosnik and Turk, 1991; Zahra, 1996; Hoskisson, Hitt, Johnson and Grossman, 2002).

While studies have recognized that innovation contributes to sustainable competitive advantage (Cahill, 1998; Ettlie et al., 1984; Ireland et al., 2001; Knott, 2003; Mone et al., 1998; O'Brien, 2003), there is surprisingly little work that explores how firms with different innovation practices differ (Ettlie et al., 1984).

Studies have focused on organisational attributes that differentiate more from less innovative firms. A number of attributes have been examined including structure, managerial characteristics, available resources, administrative intensity, and internal/external communication (Damanpour, 1991) although no set of explanatory variables has emerged (Wolfe, 1994). This may be because research in this tradition typically centers on whether or not organisations innovate (e.g., adoption decisions), rather than on how they innovate. Although our work fits within this broad research stream, we have adopted a more process-oriented approach by examining specific innovation strategies in a holistic manner.

2.16.1 Boards of Directors, External Environment and Firm's Innovation

2.16.1.1 Outside Directors

Outside directors are not able to update for the operations of the organisation, thus they have to access the information about the quality of management's strategic decisions (Tashakori and Boulton, 1985). On the contrary, insiders are well-informed due to their position (Baysigner and Hoskisson, 1990). Outside directors that focus on financial outcomes may enhance risk aversion among managers, because they have to accept risk for financial decisions when board members do not understand complex strategy formulation process. A high proportion of outside directors is positively associated with director's strategic involvement, since they contribute to the organisation more due to the knowledge that they have from different companies (Zahra et al., 2000). Although inside directors have better information, they seem to be reluctant to suggest innovative strategies. Thus, Zona et al. (2006) suggested that outside directors have contributed to firm's innovation. The previous discussion suggests the following hypothesis:

H5a: Outside directors are positively related to firm's innovation strategies.

2.16.1.2 Age

Age is regarded as an indicator of experience and a person's propensity for risk-taking (Hambrick and Mason, 1984). Young managers have an increased risk-taking propensity compared to older who prefer financial and career security (Hambrick and Mason, 1984). Older executives typically have less physical and mental stamina (Child, 1974) and less information-processing. They are more risk averse and less oriented to innovation strategy. Young managers initiate innovative strategies, because, first, they bring better cognitive resources to decision-making (Bantel and Jackson, 1989); second, they are more receptive to adopting new ideas (Hambrick and Mason, 1984); and third, they are more favourable toward risk-taking (Vroom and Pahl, 1971). Empirical findings have shown that as CEO age increases, CEOs tend to follow lower-growth strategies (Child, 1974) and reduce the R&D spending especially before retirement (Dechow and Sloan, 1991). Zona et al. (2006) proposed a negative relationship between age and firm's innovation. Due to inconclusiveness of the available research, the following hypothesis is only tentative:

H5b: Young executives are more likely to pursue innovative practices

2.16.1.3 Gender

Findings on the effect of gender on innovation are inconclusive. Stelter (2002) indicated that women adopt a more transformational leadership style compared to male counterparts, suggesting that female leaders will positively affect innovation adoption. Male managers are more likely to take risks and to initiate innovative strategies. On the contrary, female counterparts have a more participative leadership type and are more able to influence the implementation of innovation practices (Eagly and Johnson, 1990; Hooijberg and DiTomaso, 1996). DiTomaso and Farris (1992) found that female R&D engineers are less innovative compared to men. Other scholars (Sonfield et al., 2001; Damanpour and Schneider, 2006) could not provide any support between gender and innovation adoption or implementation. The above reasoning leads to the following hypothesis:

H5c: Gender is unrelated to firm's innovative practices

2.16.1.4 Tenure

Long tenured executives are likely to have restricted perspectives and limited knowledge in order to search for alternatives (Cyert and March, 1963). Tenure reflects the manager's ability to gather and process information (Miller, 1991). Over time, executives are not likely to establish routine information sources and therefore, they rely on past experience (Finkelstein and Hambrick, 1996).

Newly appointed managers are more receptive to innovation, because they bring new ideas to their job (Huber and Durfee, 1993). After a while, these managers become more inclined to accept the position and they pursue less innovative practices (Hambrick and Mason, 1984). This can be explained by the fact that tenured managers are committed to the organisational status quo (Staw and Ross, 1987) as well to organisational values (Schmidt and Posner, 1983). Thus, tenure in position and in organisation inhibits the adoption of innovation. Damanpour and Schneider (2006) proposed a negative association between tenure in position and in management and innovation adoption (Pfeffer, 1983). Damanpour and Schneider (2006) found a positive relationship between tenure in position and the three phases of adoption (initiation, decision and implementation). Long-tenured managers are knowledgeable about implementation process and have more skills to manage them (Mumford, 2000). The above discussion suggests the following hypothesis

H5d: Executives' tenure (in terms of industry, company and position) is related to firm's innovation practices

2.16.1.5 Educational Background

Executives' educational background is regarded as an indicator of the person's values and cognitive preferences mainly with respect to innovation (Daellenbach, McCarthy and Schoenecker, 1999). Educated executives are more likely to adopt and use complex and diverse approaches for problem solving and decision making (Huber et., 1993). Those executives are able to gain information in order to reduce uncertainty and facilitate the adoption of innovation (Rogers, 1995). Education is related to receptivity to new ideas, which detects innovation need and creates a favourable environment for its implementation (Damanpour and Schneider, 2006; Becker, 1970; Hambrick and Mason, 1984). Therefore, educated managers have the ability to generate solutions and have receptive attitudes toward innovation (Kimberly and Evanisko, 1981; Rogers and Shoemaker, 1971). Bantel and Jackson (1989) supported similar findings. However, a recent study conducted by Damanpour and Schneider (2006) did not support any association. Thus, the following hypotheses should be seen as only tentative:

H5e: The level of formal education is positively related to innovation strategies

H5f: Specific educational specialty favours firm's innovation strategies.

2.16.1.6 Environmental Dimensions

According to Morris and Jones (1994), environment refers to technological, economic, legal/regulatory, customer, competitive, supplier, distributor and social dimensions. Zahra et al. (2000) described the environmental turbulence by the following environmental dimensions: dynamism, hostility and complexity of a subsidiary's local environment. Naman and Slevin (1993) found that firms operating in turbulent environments are likely to be more innovative, risk-taking and proactive. Dynamic environments are characterised by changes in the environment due to technology and market shifts which create new opportunities for companies to pursue profitability and growth (Tushman and Anderson, 1986). In environmental dynamism companies tend to be more innovative and proactive in pursuing emerging market opportunities (Covin and Covin, 1990). Organisations in an attempt to respond to competition, introduce new products, administrative techniques and they adopt a competitive behaviour. Miller and Friesen (1982) argued that the more dynamic or hostile the environment is, the greater the need for innovation will be.

Hostile environments as described by Khandwalla (1977, p. 335) are “*risky, stressful and dominating*”. Hostility derives from unfavourable changes in the local market through the proliferation of rivals (Miller, 1983). Researchers argue that hostility results in intense competition in the industry and destroys any previous structural and competitive equilibrium in the industry (e.g. Pearce and Zahra, 1992; Zahra et al., 2000). Companies cope with competition by introducing global-scale efficiencies, worldwide learning and local responsiveness (Bartlett and Ghoshal, 1989). Finally, complexity is a result of perceived diversity of the needs of the different customer groups (Miller, 1983; Miller and Friesen, 1982). If environmental complex circumstances occur, companies are more proactive in their operations and encourage entrepreneurial risk-taking (Zahra, 1991). Therefore, the following hypothesis is developed:

H5g: The various environmental dimensions influence the innovation strategies.

2.17 Organisational Performance

Organisational performance is a complex and multidimensional phenomenon in strategic management literature (Venkatraman and Ramanujan, 1986). Many scholars have studied the board-performance relationship with contradictory findings (Daily, Dalton and Cannella, 2003). More specifically, regarding board composition, Rosenstein and Wyatt (1990) found a positive impact of the number of outsiders and firm’s performance. However, Hermalin and Weisbach (1991), Bhagat and Black (1999) and Dalton et. al. (1998) and Rosenstein and Wyatt (1990) did not find a robust relationship. The inconclusiveness regarding the impact of the board can be explained by the fact that there is an emphasis on board structure rather than on the background, experiences and competences of board members. Recent research takes into account a range of influential factors that might influence the impact of board to the firm’s performance such the roles of the board, the impact of board demographic characteristics, the environmental conditions and the strategic decision-making process. Few scholars have examined the impact of the strategic decision-making process on the firm’s performance (e.g. Bourgeois, 1980; Bourgeois and Eisenhardt, 1988; Dess, 1987; Goll and Rasheed, 1997). In particular, Goll and Rasheed (2005) provided support for the association between rationality in the strategic decision-making process and organisational performance during munificent environments. Outstanding performance can be achieved also with centralised and decentralised strategic decisions (Bourgeois and Eisenhardt, 1988). Papadakis (1998)

suggested a positive relationship between financial reporting and long term organisational performance.

Scholars have portrayed the upper echelons' characteristics as determinants of strategic choices and their outcome to organisational performance (Smith et al., 1994; Hambrick, Cho and Chen, 1996; Finkelstein and Hambrick, 1990). Hambrick and Mason (1984) posited that strategic choices contribute to positive organisational outcomes. Mergers and acquisitions is a strategic choice that is expected to enhance firm's performance. Scholars (e.g. Ravenscraft and Scherer, 1987; Campa and Kedia, 2002; Vermeulen, 2005) have found a positive effect of acquisitions on the firm's performance. Innovation is another strategic choice that is supposed to influence innovation through R&D. Lawless and Anderson (1996) reported that innovation is related to firm performance in dynamic environments. Therefore, a hypothesis underpinned by this research evidence could justifiably state that:

H6: Board involvement, strategic decision-making processes and innovation strategies contribute to the firm's overall performance.

2.18 Critical Observations from Literature Review

The section below will provide a brief review of the literature and will present the findings of the factors that influence strategic decisions.

Category	Empirical Studies	Findings
Environmental Conditions-Board Composition	Pfeffer & Salancik (1978)	Link between interlocking directors and environmental uncertainty.
	Bazerman & Schoorman (1983) Pfeffer & Salancik (1978) Stearns & Mizruchi (1993)	Outside directors provide access to resources and info
	Pfeffer (1972)	The proportion of outside directors was positively related with environmental demands
	Gupta (1988)	Complex environments require a more diversified top management team in order to monitor the diversity of the environment
	Janis (1972)	Complex environments face problem-solving situations and, thus, require larger and heterogeneous board
	Boyd (1990)	No impact of environmental complexity to board size and number of interlocking directorates in high performing firms.
	Keats & Hitt (1988), Bantel & Finkelstein (1995)	A direct effect of munificent environment to board size
	Mintzberg & Waters (1985)	A strong and unified leadership structure is easier to adapt environmental demands
	(Boyd, 1995)	Joint leadership structure facilitates decision-making and improves organisational performance under specific circumstances
	Daily et al. (1999) Yermack (1996)	Corporate size is also associated with board size and organisational performance
	Pugh et al. (1969) Hickson et al. (1969),	The association between board size and board structure
	Clifford & Evans (1997), O'Sullivan (2000) Shivdasani & Yermack (1999)	Larger companies appoint a larger board size and have a greater representation of non-executive directors.
	Gertner & Kaplan (1996)	Small boards contribute to organisational performance
	Boyd (1990), Goodstein et al., (1994), Alexander et al., (1993)	Large boards are associated with higher levels of firm's performance
	Holthausen & Larcker (1993), Wan & Ong (2005), Rose (2005)	No support for hypothesised relationship between board size and company's performance

Board Involvement in SDM	Finkelstein and Mooney, 2003	Board size with level of involvement in the strategic decision-making process	
	Baysigner & Hoskisson(1990) Goodstein &Boeker (1991) Johnson et al. (1993) Judge & Zeithaml (1992)	Inside directors provide valuable insights and information because they participate in the strategic decision-making process	
	Ruigrok et al. (2006)	The proportion of insiders or outsiders respectively directors does not affect their involvement in the strategic decision-making process	
	Pugliese (2006)	The frequency of board meetings alongside with their duration shows an active participation of the board in the decision-making phase	
	Boulton (1978), Goodstein et al. (1994)	The strategic role of board members is critical within periods of environmental uncertainty	
	Pugliese (2006)	The frequency of board meetings alongside with their duration shows an active participation of the board in the decision-making phase	
	Boulton (1978), Goodstein et al. (1994)	The strategic role of board members is critical within periods of environmental uncertainty	
	Hitt & Tyler (1991)	CEO's demographic characteristics have an impact on the strategic decision- making processes	
	Papadakis et al. (1998) Bantel (1993)	Education level is positively associated with financial reporting	
	Papadakis & Barwise (2002)	TMTs' characteristics (education and competitive aggressiveness) are related to the degree of hierarchical decentralization.	
	Goll & Rasheed (2005)	A significant and positive relationship between tenure and educational level and rational decision-making	
	Miller & Friesen (1983); Eisenhardt (1989b)	Environmental dynamism is associated with greater level of rationality in the planning process at high performing firms	
	Fredrickson & Iaquito (1989)	Companies operating in stable environments have rational-comprehensive strategic processes.	
	Bourgeois&Eisenhardt (1988)	Firms operating in high velocity environments have to follow rational decision-making process	
	Khandwalla (1973) Miller and Friesen (1983)	Firms operating in low munificent environments follow comprehensive decision processes	
	Strategic Decision-Making Process		

Innovation	Eisenhardt & Schoohoven (1990), Bantel & Jackson (1989), Finkelstein & Hambrick (1990), Smith et. (1994) Gupta & Govindarajan (1984), Sturdivant et al. (1985)	Executives' characteristics are significant determinants of organisational strategy
	Gupta & Govindarajan (1984)	Marketing and sales functional background were associated with taking growth strategies than taking harvest strategies.
	Kimberly & Evanisko (1981), Bantel & Jackson (1989)	Executive educational background was associated with innovation.
	Bantel & Jackson (1989), Enns, Huff and Golden (2003)	Linkage between executives' demographic characteristics and innovation strategy
	Papadakis et al. (1998); Elenkov (2002)	Strategic choices are influenced by top managers and external environment
	Tushman & Anderson (1986)	Dynamic environments are characterised by changes in the environment due to technology and market shifts which create new opportunities to companies to pursue profitability and growth
	Covin & Covin (1990)	In environmental dynamism companies tend to be more innovative
	Morris & Jones (1994) Zahra (1991)	In environmental complex circumstances occur, companies are more proactive in their operations and encourage entrepreneurial risk-taking

Organisational Performance	Bourgeois (1980) , Bourgeois & Eisenhardt (1988) Dess (1987)	Strategic decision-making process influences the firm's performance
	Goll & Rasheed (2005), Fredrickson (1984) Fredrickson & Mitchell (1984)	Association between rationality in the strategic decision-making process and organisational performance during munificent environments
	Dess & Origen (1987), Pearce, Robins & Robinson (1987), Grinyer & Norburn (1977-78)	Rule formalisation was found to have a positive relationship
	Bourgeois & Eisenhardt (1988), Burgelman (1983) Wooldridge & Floyd (1990), Judge & Zeithmal (1992)	Board involvement in the strategic decision-making process enhances organisational performance
	Bertrand & Schoar (2003)	Certain strategic choices have improved the financial position of the firm
	Vermeulen (2005)	Acquisition activities affect firm's performance
	Lawless & Anderson (1996)	Innovation is related to performance within dynamic environments

2.19 Integrative Framework of the Study

Critical review of previous strategic management literature yields some key observations beyond their existing presentation in previous sections.

First, an integrative model has not been developed that examines the factors that influence the strategic decisions. Although there are a numerous studies that have examined the role of upper echelons in determining strategy contents, process and performance (Brouthers et al. 2000; Hambrick and Mason, 1984; Miller and Toulouse, 1986), there is limited research, to the best of the author's knowledge, regarding the influence of the characteristics of executives on strategic decision-making processes. Lyles and Mitroff (1980, p. 117) posit that *"It is still not clear what influence managerial characteristics have on the organisational problem-formulation process"*. The study aims to investigate the key factors that influence the member of the board to improve organisational performance.

Second, previous research has based on theoretical reflections about board role expectations, but actual board task performance is rarely measured (Gabrielsson and Huse, 2004). The existing literature on executives focuses on TMTs and mainly examines board-performance relationship with contradictory findings. Therefore, one of the challenges is to clarify the process of strategic decisions and how they affect the financial performance.

Third, most of the studies have focused on the managerial characteristics and their impact on strategic decisions. As a result limited research has investigated the impact of environmental dimensions on the strategic decision-making process (Goll and Rasheed, 2005; Wan and Hoskisson, 2003). Thus, examining managers respond to the external environment and pursue certain strategic decisions according to environmental challenges would be an original research.

Finally, board research has failed to establish any association between demographic characteristics and organisational outcomes (Schwenk and Dalton, 1991; Johnson et al., 1996; Zahra and Pearce, 1989). Furthermore, current literature has either focused on the impact of managerial characteristics on the strategic decision-making process or on the strategic choices (e.g., diversification, mergers and acquisitions, capacity). Therefore, it will be pioneer to the existing knowledge to open the "black box" within Boards of

Directors' dynamics and understand the impact of environmental conditions and managerial attributes on both the context and the process of strategic decisions. Based on the above gaps, the conceptual framework, for this research, is developed as shown in Figure 2:2.

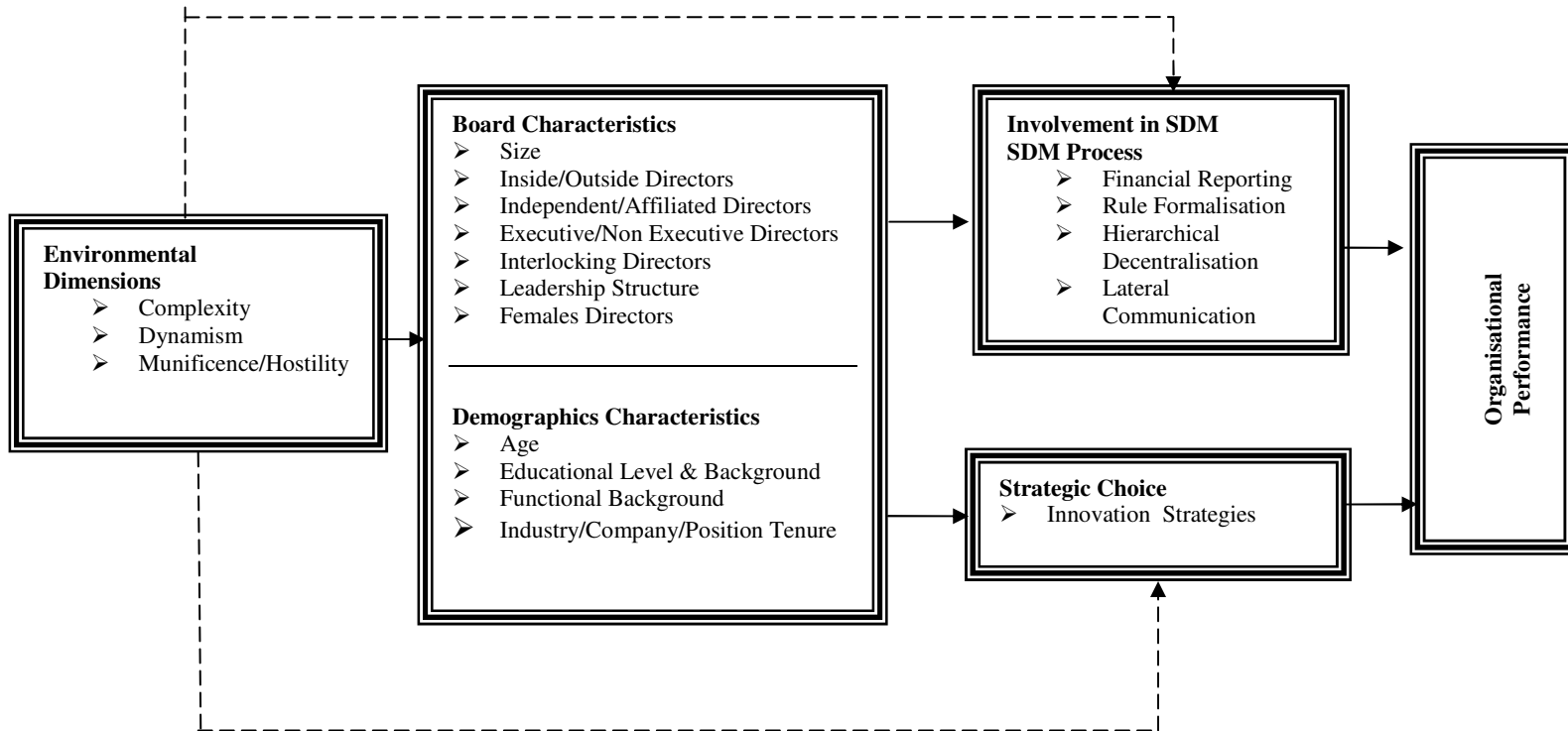


Figure 2:2 Theoretical Framework of the Study

In strategic management literature two important topics have been identified, first, the role of Top Management (Lewin and Stephens, 1994) and second, the process of making strategic decisions (Rajagopalan et al., 1993; Papadakis and Barwise, 1998). Although numerous studies have examined the role of upper echelons in determining strategy content, process and performance (Brouthers et al. 2000; Hambrick and Mason, 1984; Miller and Toulouse, 1986), there is limited research so far on the influence of the characteristics of executives on strategic decision-making processes.

The existing literature on executives focuses on TMTs and mainly examines board-performance relationship with contradictory findings. Hambrick and Mason (1984) have introduced the upper echelons perspective in macro-organisational research. They suggested that “*organisational outcomes-both strategies and effectiveness –are viewed as reflections of the values and cognitive bases of powerful actors in the organisation*” (1984, p. 193) and provided the foundations for further research on an organisation’s dominant coalition. Eschewing “*some important but complex psychological issues*”, Hambrick and Mason (1984, p. 193) recommended that “*their primary focus is on managerial characteristics as indicators of the given that a manager brings to an administrative situation. These observable managerial givens are demographic factors such as age, tenure in the organisation, functional background, education, socioeconomic roots and financial position*”.

This study is actually based on the theoretical framework of Hambrick and Mason (1984), but because executives’ cognitions, values and perceptions are hard to be measured, they have been omitted from the theoretical framework. The theoretical framework that was developed includes not only the upper echelons’ demographic characteristics but also composition characteristics. Furthermore, it focuses to a greater extent on adding nuance to understanding of the processes by which executives affect organisational outcomes and elaborating on Hambrick and Mason’s original model.

In the research model below, additional fundamental issues related to upper echelons have been incorporated such as: board structure, involvement in strategic decisions as well as the certain characteristics of strategic decision making process and the strategic choice of innovation.

The limited knowledge on board decisions has stimulated the researcher's interest to examine the factors that affect firm's strategic decisions. In this study, Boards of Directors are considered as a social construction and board members are understood through their attributes, working styles, and actual board task performance and the processes inside the boardroom. Therefore, for the present study, an integrative theoretical model was developed by combining the effects of Boards of Directors on both strategic decision-making process and strategic choice of innovation.

The study introduces a theoretical framework which combines the strategic decisions from both research and process perspectives providing a holistic perspective on the factors that influence strategic decisions in Greek listed organisations. The proposed theoretical framework aims to cover the existing gaps in the literature and to address the main issue regarding the explanatory factors of strategic decisions. Figure 2:2 depicts an integrative model by combining factors associated with four perspectives on the strategic decisions: (1) environmental dimensions, (2) board structure characteristics, (3) board members' demographic characteristics and (4) financial performance.

The model highlights an array of theoretical constructs proxied by Boards of Directors' attributes and empirically linked to major organisational outcomes. The proposed theoretical model is an expansion of the model of Hambrick and Mason (1984) regarding upper echelons. Furthermore, the study is applied to Boards of Directors since business literature focused on TMTs research supported by contradictory findings and neglected the role of the board in strategy formulation and in strategic choices. This study aims to examine in depth the phenomenon of Boards of Directors and how they affect the firm's strategy. This research attempts to examine the impact of external environment on board composition, on board involvement in strategic-decision making, on strategic-decision making process and finally, on innovation. Overall, the study aims to identify the factors that affect the strategic decisions of Greek firms.

In this research, theories on Top Management Teams have so far been applied (e.g. agency, stewardship, resource dependency and upper echelons theory) to Boards of Directors. The empirical work regarding Boards of Directors with these constructs is limited and second, they are both considered as the most influential apex of an organisation. The integrative theoretical framework is tested in a new cultural context; Greece. In particular, it is applied to Greek executives of listed companies in the Athens Stock Exchange. Corporate

governance in Greece is in a primary stage. During the last couple of years they have established some legislation regarding corporate governance operations and behaviour of Greek corporations as well as the Greek legislations regarding corporate governance. Corporate governance practices in Greece as well as the proposed theoretical framework have not been examined empirically before.

The preceding chapter reviews a number of issues, which have been extensively tested in empirical studies within strategic leadership and upper echelons theory. Empirical studies within corporate governance and strategic leadership have been reviewed. The purpose of the study as already mentioned is to explain and investigate the phenomenon of Upper Echelons, therefore this chapter attempts to synthesise the concept of Boards of Directors and presents an integrated model forming a conceptualisation of the factors associated with environment, board composition, board's demographic characteristics, involvement in strategic-decision making, the strategic-decision making process and strategic choice and their final effect on organisational performance (see Figure 2:2).

2.20 Research Hypotheses

Based upon the review of previous literature, the following research hypotheses are developed for this study these are aggregated below.

H1a	The more complex the environment, the larger the size of the board and the higher the number of interlocking directorates
H1b	The more unstable the environment the larger the size of the board
H1c	The more munificence the environment the larger the size of the board
H1d	Munificent environment is negatively related to both board size and the number of interlocking directorates
H1e	Dynamic environments favour the dual leadership structure
H2a	The larger the firm's size, the larger the board size
H2b	The larger the board size the better the organisational performance
H2c	The larger the board size, the higher the number of executive BOD
H2d	The higher the board size, the higher the number of non-executive BOD
H3a	Board size is negatively related to board involvement in the strategic decision-making process
H3b	Inside representation is positively related to board involvement in the strategic decision-making process
H3c	The higher the frequency of board meetings, the higher the board's strategic involvement will be
H3d	The longer the board meetings, the higher the board's strategic involvement will be.
H3e	The more uncertain the environment, the more involved the board will be in the strategic decision-making process
H5a	Outside directors are positively related to firm's innovation strategies.
H5b	Young executives are more likely to pursue innovative practices
H5c	Gender is unrelated to firm's innovative practices
H5d	Executives' tenure (in terms of industry, company and position) is related to firm's innovation practices
H5e	The amount of formal education is positively related to formal innovation strategies
H5f	Specific educational specialty favours firm's innovation strategies.
H5g	The various environmental dimensions influence the innovation strategies.
H6	Impact of board involvement, strategic decision-making processes and innovation strategies to the firm's overall performance.

2.21 Hypothesised Theoretical Framework

The hypothesised model for this research will be presented according to the sequence of the hypotheses. The phases of the hypothesised model will be presented in the Figures below. Due to the complexity of the theoretical framework presented in Figure 2:2, the original theoretical framework was divided into sub-figures aiming to depict the interrelationships between the constructs and to test the hypothesised relationships. The design of separate figures will provide a clear understanding of the proposed hypotheses.

Figure 2:3 illustrates an association between the external environment and the board composition. In particular, research hypotheses H1a-H1d suggest that companies operating in complex, uncertain and hostile environments require a large board and a high number of interlocking directors that will provide the organisation with critical information and resources that will facilitate their strategic decisions. Furthermore, hypothesis H1e suggests that companies during environmental turbulence adopt a unified leadership structure.

Figure 2:3 Hypothesised Research Model between Environmental Conditions and Board Structure

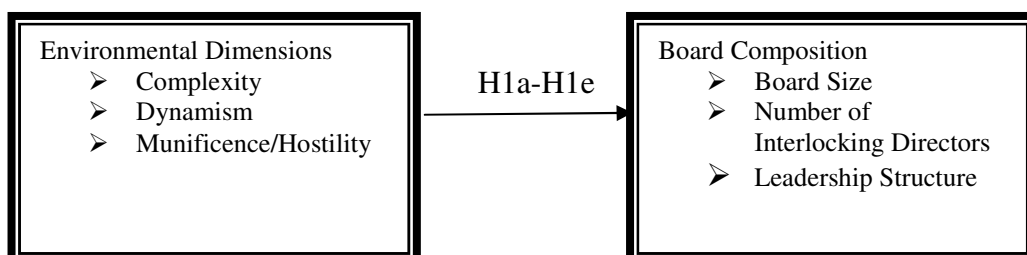
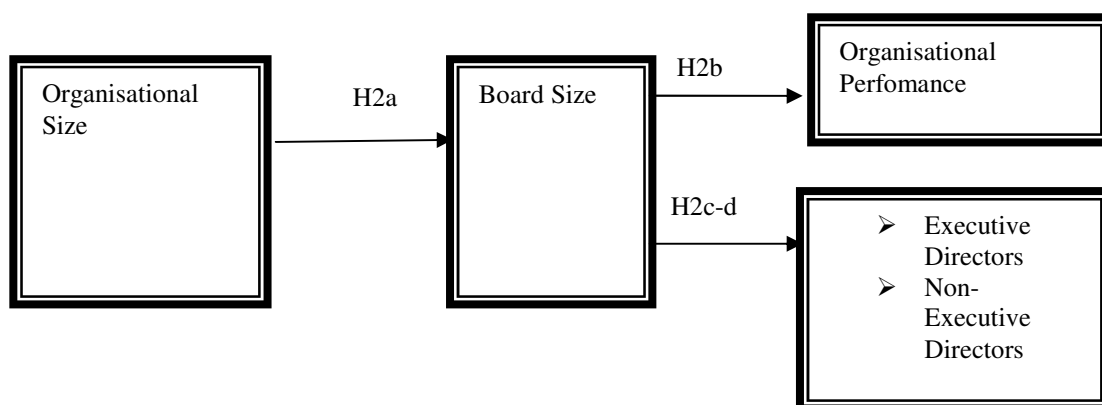


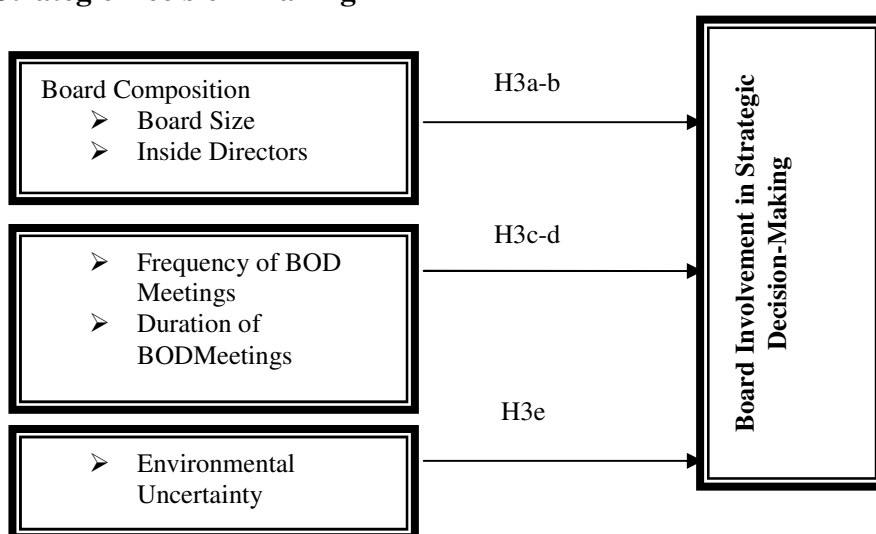
Figure 2:4 depicts the association between the organisational characteristics and the board composition characteristics. Hypothesis H2a suggests a positive relationship between organisational size and board size. Hypothesis H2b suggests that the board size contributes to the organisational performance. In addition, Hypothesis H2c proposes an effect of board size to the number of executive and non-executive board members respectively.

Figure 2:4 Hypothesised Research Model between Organisational Structure and Board Structure



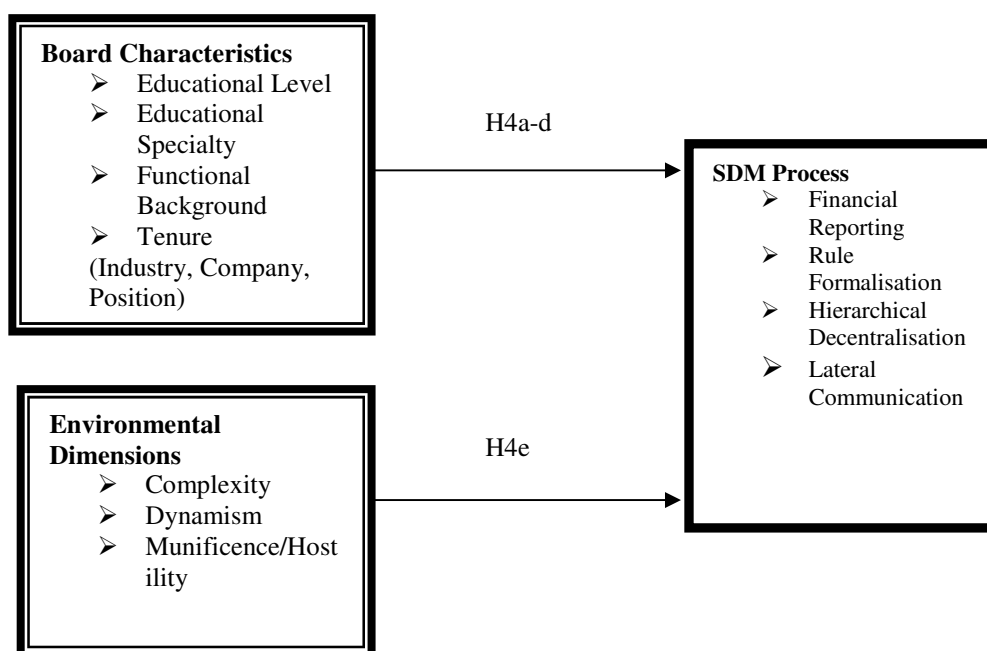
Below the figure 2:5 presents the relationships between the factors that influence board involvement in the strategic decision-making process. Hypothesis H3a proposes a negative association between board size and the different forms of strategic decision-making processes. Hypothesis H3b examines the impact of inside directors to the involvement in the strategic decision-making process. Hypotheses H3c and H3d indicate an association between the frequency and the duration of the board meetings and their involvement in the strategic decision-making process. Finally, Hypothesis H3e suggests an effect of environmental munificence towards the board in the several stages of strategic decision making processes.

Figure 2:5 Hypothesised Research Model of the Factors Affecting Board Involvement in Strategic Decision-Making



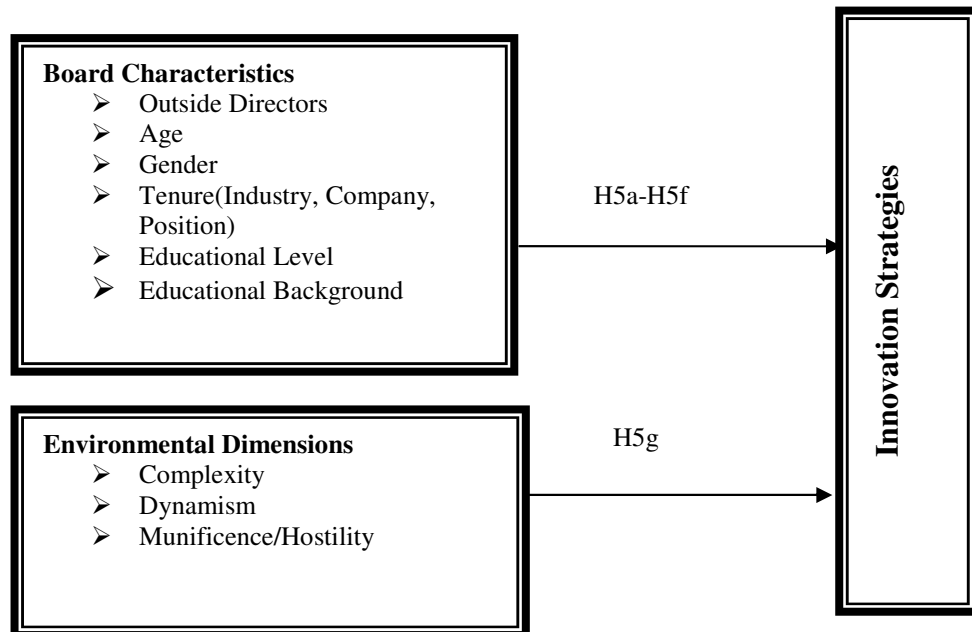
Similarly, Figure 2:6 depicts the factors that play an influential role in the strategic decision-making process. Hypotheses H4a, b, c and d examine the relationships between managerial characteristics and strategic decision-making process. Also, Hypothesis H4e investigates the effect of the environment on strategic decision-making process.

Figure 2:6 Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Strategic Decision-Making Process



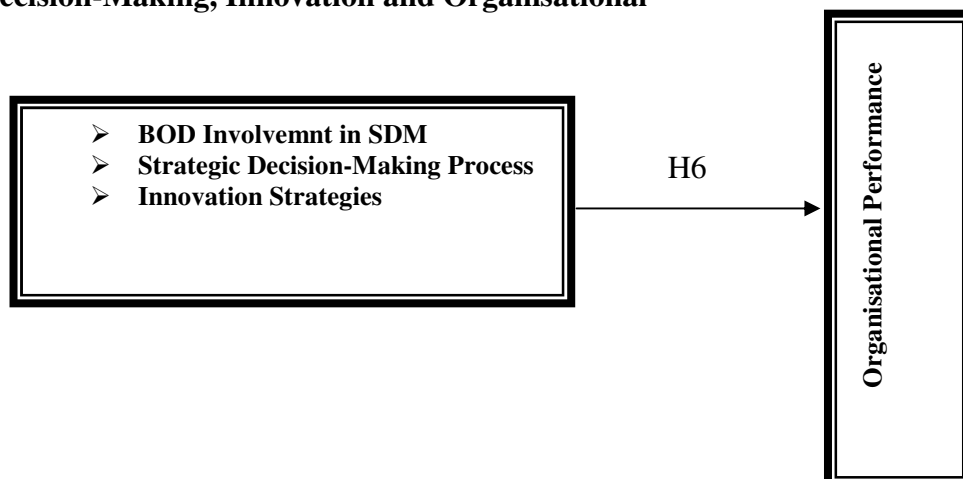
The associated factors between board characteristics and innovation strategies are presented in the Figure 2:7 suggesting an effect of demographic managerial characteristics among them age, gender, tenure, education level and background as well as the number of outside directors on innovation strategies. In particular, Hypothesis H5a examines whether the proportion of outside or external directors contribute to the innovation practices. Hypothesis H5b suggests a relationship between executive's age and innovation practices. Hypothesis H5c states that gender is unrelated to firm's innovative practices. Hypothesis H5d suggests that the number of years that Greek board members have spent in the current industry, company or position is associated with innovation practices. Hypotheses H5e and H5f advocate a positive relationship between education and innovation strategies. Hypothesis H5g investigates how Greek executives pursue innovation strategies within various environmental dimensions.

Figure 2:7 Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Innovation Strategies



The last hypothesis presented in Figure 2:8 is developed in order to investigate the influential role of key strategic decisions that Boards of Directors pursue towards the organisational performance. The concluding hypothesis aims to examine the final outcome of board involvement in the strategic decision-making process, the strategic decision-making processes of financial reporting, rule formalisation, hierarchical decentralisation as well as lateral communication and finally the innovation practices on the organisational performance.

Figure 2:8 Hypothesised Research Model between BOD Involvement, Strategic Decision-Making, Innovation and Organisational



2.22 Cultural Context: Greece

2.22.1 General Context

The population in Greece exceeds 10 million people. Greece is a developed country, a member of the European Union since 1981 and a member of the Economic and Monetary Union (EMU) of the European Union (EU) since 2001. Greece became the tenth member of the European Union on 1 January 1981 and ever since the nation has experienced a remarkable and sustained economic growth. Investments in industrial enterprises and heavy infrastructure, funds from the European Union and growing revenues from tourism, shipping and a fast growing service sector have increased the standards of living to unprecedented levels. Greece has a stable democratic political system and a free market economy. Greek has been characterised as an advancing economy because it is between developed and developing countries with more of their disadvantages than advantages. The remuneration of employees is higher compared to third world countries but not compatible with those of developed countries however the productivity of employees is lower. The majority of Greek firms are small and family owned with limited R&D and market spending due to their size. The low R&D spending forces Greek firms towards low value added products and services where competition is fierce and profit margins are small and where developing countries due to low wages have a considerable advantage. Greece faces a great number of government regulations, huge bureaucratic obstacles, and uncooperative labour unions particularly in the public sector and with a labour force with high expectations. These circumstances prevent Greek companies from taking strategic actions and provide them with problems and challenges which are different to those of developed or under developed countries (Makridakis et al., 1997).

After World War II, Greece transformed from an agricultural to an industrial and service – based economy. It has experienced the "*Greek economic miracle*" since the GDP growth averaged 7% between 1950 and 1973. However, the industrialisation in Greece has fallen behind in its rate of economic growth and has been approached by countries like Portugal. Greece has been the poorest country in the EU and has implemented of a number of structural and fiscal reforms while receiving considerable European Union funding. Responsible for this situation are various governments which did not make the appropriate choices that contribute to economic wealth and allow Greek firms to adjust to environmental challenges in order to become internally competitive (Makridakis et al., 1997). According to World Competitiveness Scoreboard, the performance of Greek

companies has been rated as the 40th out the 45 nations (IMD, 1996). At the same time, the Scoreboard rankings revealed that the Greek economy includes some highly competitive industries (e.g. merchant shipping) and some extremely well managed firms which achieve excellent results (Papadakis et al., 1997) despite the competitive environment in which they operate.

In 2001, Greece joined the Economic and Monetary Union (EMU). Empirical findings show an increase of foreign direct investment over the last thirty years. Greek governments have offered investment incentives through capital grants, tax allowances, increased depreciation rates and interest rate subsidies. Before 1992 European drive toward a “single market”, a large number of European and some U.S. companies have invested in several Greek industries, mainly by acquiring them. For instance, the acquisition of Metaxa (ouzo and brandy producer) by Grand Metropolitan, of AGET Hercules (cement producer) by Calzestruzzi, of Pavlivis (chocolate producer) by Jacobs Suchard and of Misko (pasta producer) by Barilla. Currently the service industry is considered as the most vital and fastest-growing sector of the Greek economy, followed by industry and agriculture (ICAP, 2006). In addition, the shipping industry plays a key role in Greek economic activity dating back to ancient times.

2.22.2 Cultural Context

Previous research suggests that the management of Greek organisations as an art and science is underdeveloped relative to other national partners (EEDE, 1986). From the Greek culture of management, it is not easy to classify Greece as a member of any one of the clusters of countries suggested (Cummings and Schmidt, 1972; Hofstede, 1980). Hofstede (1980) found that Greece was characterised by the highest “*uncertainty avoidance*” index as well as by a masculine culture. He suggested that the need for security and status are important for Greeks. Mead (1955) and Triandis, Vassilious and Nassiakou (1968) have mentioned that the need for self-esteem is strong in Greeks and that it derives from the prominent cultural value known as *philotimo* (cooperative and self-sacrificing behaviour). The majority of empirical studies have been carried out in Greece a few decades ago, in a period of low levels of industrialisation, growth rate and level of disposable income. In addition, during this period Greece was experiencing high levels of unemployment, immigration and low educational level among employees, managers and entrepreneurs. However, the situation in Greece has changed since Greece joined the

European Union and the levels of education, development, political stability and democracy have been improved. Bourantas et al. (1987) mentioned that there are significant changes in the needs of Greeks suggesting that Greeks place enormous attention on the “ego needs” of self-esteem and status through wealth. Regarding the Greek leadership styles, Hofstede (1976) showed that Greek executives preferred the consultative style (i.e., 70 percent of respondents preferred the consultative style, 18 percent the participative style, 12 percent the persuasive style and 0 percent the autocratic). Triandis et al. (1968) suggested two central attributes of the Greek national character are extreme competitiveness and an unusual response to people in authority. Within the in-group (members of a person’s immediate family, friends) people with authority and cooperative behaviour are welcome compared to those within out-group people which suspicious, hostile and extremely competitive behaviour.

2.19.2 The Management Culture of Greek Organisations

Academic writings have focused on the impact of individual behaviour and organisational effectiveness suggesting that different organisation have different cultures and different effects on organisational effectiveness (Ouchi, 1981; Pascale and Athos, 1982; Beyer, 1981; Deal and Kennedy, 1982; Kilmann, 1984; Schein, 1985). Corporate cultures have been shaped by certain factors such as: the founder (Pettigrew, 1979), leadership style (Schein, 1985) and environment of the organisation (Beyer, 1981; Bhagat and McQuaid, 1982).

Harrison (1972) and Handy (1980) have developed a framework which compares the attributes of four gods of Greek mythology. The name of each of the four gods is used to describe the management and organisational culture:

- *The Club Culture (Zeus):* Zeus is the king of the gods and respected by other gods and is the figurehead of the club culture. He represents the power-centered patriarchal tradition with irrational but often benevolent power and charisma. This type is found in small enterprise organisations.
- *The Role Culture (Apollo):* Apollo is the the god of of order and rules. This culture assumes that humans have rational behaviour. The role is fixed and individuals are

parts of the machine, doing their jobs in a more or less freely interchangeable fashion.

- *The Task Culture (Athena)*: The task culture, under the figurehead of Athena, the goddess of wisdom, recognises only expertise as the basis of power and influence. Management is concerned with the successful solution of problems. It draws resources from different parts of the organisation in order to focus on a particular problem.
- *The Existential Culture (Dionysus)*: Existentialism assumes that the world is not part of some high purpose and everybody is in charge of his or her own destiny. This philosophy has various managerial implementations. The individual helps the organisation to achieve its goals and the organisation helps the individual to achieve his purpose.

In Greece most private firms are family businesses and their top management consists of members of their family who dominate whatever professional management there is. Managers of Greek public enterprises are appointed by the Government and consist of political friends and party leaders. The appointment of professional managers is rare. The concentration of power and control are in the hands of top management teams. Bourantas et al. (1990) found that the majority of Greek managers perceived their companies to be dominated by centralised power (Zeus) and bureaucratic roles (Apollo). This reflects the autocratic nature of industrialists which is consistent with previous research (e.g. Cummings and Schmidt, 1972; EEDE, 1986; Makridakis et al., 1996; Nikolaidis, 1992). Papadakis (1993) reported a lack of modern systems to support strategic decisions. The strategic decision-making styles of Greek companies are less comprehensive/rational and less formalised, used less lateral communication and experience and more problem-solving dissension. Others (e.g. Kanelopoulos, 1991; Papalexandris, 1988) have documented a lack of wide diffusion of modern management methods and systems such as formal structures, planning and control systems, human resource management systems and management information systems.

An important question that has been raised is whether the Greek management has any unique characteristic that distinguishes it from other European management styles (e.g. the institutionalised participation of employees in Germany or Sweden and the informal network relationships among small and medium-sized enterprises in Italy). So far, the existing empirical work has not identified an important dimension distinguishing Greek

management from the management style of other European countries. Bourantas and Papadakis (1997, pp. 23-24) stated “*We would rather characterize Greek management as a Western-Type management style that has not yet reached a high level of modernization and adoption of scientific and analytical methods and techniques*”. They imply that Greek management differs in the degree of modernisation and professionalism of management functions, management systems and professional knowledge and skills. Greek management compared to other European countries does not have any different model but a different degree of development.

The fact that Greek management is not differentiated from the Western model can be explained by the fact that Greece was fully liberated from foreign occupation only at the beginning of this century. Therefore, Greece “missed” the Renaissance and the industrial revolution and at the same time the developments in Western Europe did not come fast in Greece. The majority of the entrepreneurial class of the beginning of the century were Greeks who lived and worked in other European countries (Bourantas and Papadakis, 1997).

The underdevelopment management in the private sector can be attributed primarily to the family status and the small size of most firms (Georgas, 1993). Their small size prevented them from attracting, hiring, and rewarding high-quality professional managers (Papadakis, 1993). At the same time, the managers are not willing and are not aware of the techniques of modern management (Georgas, 1993). The traditional structure and functioning of the Greek state especially prior to EU integration did not encourage management modernisation. So far, the small firms have survived due to the high level of protectionism. The management education of until the mid-80s was underdeveloped. The graduates of the Greek technical universities received very little formal management training, while economic and business universities focused more on law, macroeconomic and accounting courses rather than on management and marketing (Bourantas and Papadakis, 1997).

The underdevelopment of management in the public sector is due to powerful political forces. Modern Greece is a relatively new democracy that bears painful memories from both world wars, from the civil war of 1944-49, and from the military dictatorship of 1967-73. The above circumstances have strengthened the power of politicians over technocrat managers mainly in the state controlled enterprises. Even in our day, the top management teams of major public enterprises are appointed by the government due to their loyalty and

to their contributions to the political party rather than managerial competence (Bourantas and Papadakis, 1997).

Despite the fact that Greece is developing slowly compared to other counterparts, it is worth mentioning that the society is undergoing some major changes. The forces of these changes are related to macroenvironmental dimensions. Two well-known management theories are used to explain the evolution of the Greek management: environmental determinism and comparative management. The former posits that organisational structures, management systems and practices are determined by the complexity, hostility and dynamism of the external environment in which the company operates. This perspective has received considerable theoretical and empirical support (Aldrich, 1979; Bourgeois, 1984; Hofer, 1975) and it seems to apply to Greek context. This argument suggests that the external “environment” forces drive Greek management toward rapid convergence with “Western type-professional management”. In comparative-management studies, several forces determine management in various national contexts. Farmer and Richman (1965) categorised these factors into: sociocultural, sociological, educational-learning, political-legal and economic.

Papadakis and Bourantas (1997) developed a theoretical framework in which they have incorporated the following forces: environmental dynamism and complexity, sociocultural, educational-learning, political-legal and economic that could influence either at a national or European international level the evolution of Greek management. The results of their study showed that there is a gap between the cultures and management practices of Greek-owned organisations and those of subsidiaries of multinationals operating in Greece. The forces that bring Greek management into line are EU membership, the presence of many subsidiaries of multinationals, the strong expedition for modernisation and expansion to neighboring countries and the restructure of university education towards a “*Western-type/professional*” management. However, there are forces that prevent Greek management evolution including the “*administrative heritage*”, the lack of strong and differentiated Greek management culture, political intervention and the weak economy of Greece compared to other EU members.

2.23 Concluding Remarks

This chapter has attempted to introduce the concept of Boards of Directors and examined its conceptual elements and provided the theoretical platform of the research carried out and documented in this thesis. The main body of the literature review focuses on environmental dimensions, on Boards of Directors, board's demographic characteristics, involvement in strategic decision-making, the strategic decision-making process, strategic choice of innovation and organisational performance. A theoretical framework between the factors that influence strategic decisions and the hypothesised relationships are developed and presented in Figure 2:2 showing the hypothesised relationships between the factors that influence strategic decisions. Also, it provided the geographical and socioeconomic context with which this study is set – Greece. The research design and methodology for the study are described in the following chapter.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In the previous chapters, relevant theory was reviewed and evidence was provided in support of the hypothesised relationships between Boards of Directors, strategic decision-making process, strategic choices, environmental variables and firm's performance. This chapter attempts to illustrate the proposed methodology for the study and explain the overall design used for testing the conceptual model presented below. The principal themes that are documented are: empirical research objectives, research approach, survey methodology, data collection methods, and finally, data analysis methods.

3.2 Empirical Research Objectives

“The objective of academic research, whether conducted by sociologists, political scientists, or anthropologists, is to try to find answers to theoretical questions within their respective fields. In contrast, the objective of applied social research is to use data so that decisions can be made” (Rubin, 1983, pp. 6-7).

A number of empirical research objectives were formulated from the conceptualisation and hypotheses development proposed in Chapter 2. The first objective is to examine the impact of external environment on board composition, board involvement, strategic decision-making process, and strategic choice of innovation. The second objective is to investigate the effects of the board structure as well the board's demographic characteristics on board involvement in strategic-decision making, on certain characteristics of the strategic decision-making process and on strategic choice of innovation. Finally, the third objective is to identify the influence of board involvement, the strategic decision-making process and strategic choice of innovation to firm's performance.

In acknowledging each of these empirical research objectives, the ultimate aim of the study is to determine the factors that influence the strategic decisions of Greek executives. Therefore, data were collected for an analytical purpose. The methodological approach for the study will be analysed below.

3.3 Research Approach

3.3.1 Research Methodology

Research methodology refers to a procedural framework within which the research is conducted. It describes an approach to a problem that can be implemented either in a research programme or process.

Leedy (1989) defined research methodology as “*an operational framework within which the facts are placed so that the meaning may be seen more clearly*”. Research methodology refers to the theory of acquiring knowledge and the activity of considering, reflecting upon and justifying the best methods. Methods are the specific techniques for obtaining the data that will provide the evidence base for the construction of the knowledge. Therefore, methodology is concerned with the theoretical and overall approach to a research project rather than with the characteristics and practical application of particular methods (Wellington et. al, 2005).

Business and management research provides conclusions that enhance knowledge and understanding but also address contemporary business issues and practical managerial problems (Saunders et al. 2003). Additionally, Zikmund (2003) defined business research as the methodical and objective procedure of getting the necessary information in order to facilitate the decision making procedure regarding various organisational issues.

The purpose of a research method is to investigate a particular and therefore, to choose the appropriate method for the specific research problem. As Bryman (1989, p. 255) stated: “*Each design and method should be taken on its merits as a means of facilitating (or obscuring) the understanding of particular research problems, ...a fetishist espousal of favourable designs or methods and an underpinnings can only stand in the way of developing such an understanding*”.

As has been established in Chapter 2, corporate governance in Greece is in a primary stage and most of the constructs of this research have not been examined empirically before. Therefore, it is required a careful consideration of fitting research methods is required. There is a remaining gap in our understanding, since there is no theoretical similar work to our model and it will be examined empirically in a new cultural context; Greece. The research problem in the study is to discover the impact of external environment on board

composition, strategic decisions; the effects of board structure as well board's demographic characteristics on involvement in strategic-decision making and on strategic choice of innovation. Finally, the aim is to explore the effects of strategic decisions on firm's performance.

3.3.2 Methodological Distinctions

The dominant approaches that have been developed in the area of management are ontology and epistemology (Burrell and Morgan, 1979).

Ontology and epistemology influence the structure and processes of social research and provide explanations in the area of *philosophy of science* (Machamer, 2002; Nelson, 1990). Ontology derives as a term from theology and is concerned with the nature or essence of things. Ontological assumptions focus on issues around being human within the world and whether a person sees social reality or aspects of the social world as external, independent, given and objectively real or instead as socially constructed, subjectively experienced (Wellington et. al, 2005). Ontology informs methodologies as to the nature of reality or better as to "what" social research is supposed to study (Sarantakos, 2005).

On the contrary, epistemology is the theory of knowledge and deals with what constitutes knowledge, from where knowledge comes and whose knowledge it is, and with what it is possible to know and understand and represent. '*Epistemology*', according to Chambers Dictionary, is *the theory of knowledge*, thus epistemology is concerned with what does and does not count as knowledge. In Plato's dialogue Theaetetus, Socrates considers knowledge is as true belief that has been "*given an account of*". An epistemological issue concerns the question of what is considered as acceptable knowledge in a discipline (Bryman and Bell, 2003). Epistemology informs methodologies about the nature of knowledge, or about what counts as a fact and where knowledge is to be sought (Sarantakos, 2005). Methodology as a research strategy translates ontological and epistemological principals into guidelines that show how research has to be conducted (Cook and Fonow, 1990, p.72). For the purpose of the undertaken study, the epistemological research approach is applied.

3.3.3 Epistemological Approach

In the section below different epistemological approaches will be described providing some understanding of the philosophical foundations and different approaches to research methods.

a. Positivism and Post Positivism

Positivism is an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond (Neuman, 2006). Positivist theory was developed in detail during the early part of this century although its fundamental concepts can be traced back to the philosophers of the Enlightenment but it was the French philosopher August Comte who posited that the principles of natural science could be applied to the study of human behaviour. Positivism can take many forms (Halfpenny, 1982).

In the social sciences, there is an attempt to discover the factors which cause phenomena in much the same way that scientists construct various theories to explain the behaviour of dependent variables. Positivism maintains that knowledge should be based on real facts, not abstractions, thus knowledge is predicated on observations and experiment in contrast to the phenomenological paradigm of searching for the inner meaning or the essence of things (Robson, 2002). Positivism is associated with many specific social theories and acts as a linkage to structural-functional, rational choice and exchange-theory framework. According to positivism, “there is only one logic of science, to which any intellectual activity aspiring to the title of “science” must conform (Keat and Urry, 1975 p. 25). Positivist social science is “*an organised method for combining deductive logic with precise empirical observations of individual behaviour in order to discover and confirm a set of probabilistic causal laws that can be used to predict general patterns of human activity*” (Neuman , 2006, p. 82).

Positivism is also known as hypothetico-deductive methods and follows the specific sequence: first, a formally expressed general statement which attempts to test theory; second, the purpose of the theory is to generate hypotheses that can be tested and allows explanations of laws to be assessed (deductive principal); third, a careful operationalisation of constructs; fourth, measurement of constructs; fifth, hypotheses testing and finally,

verification of the theory (Jankowicz, 2000). Positivism is considered as link between the theory and the research and attempts to test theory in order to increase predictive understanding of phenomena.

In our days, positivist approach is predominant in management research (Alvesson and Deetz, 2000; Alvesson and Willmott, 1992) and is similar to the natural and physical science approaches provided that it falls into the following main grounds: 1. That there is no single method which generates scientific knowledge in all cases. 2. That what may be an appropriate method for researching the natural or physical world may be inappropriate in the social world given the inherent meaningfulness of management action and its contextual nature. 3. That knowledge generated is affected by the goals of managers and their validation criteria (Cited in Gill and Johnson, 2002, p. 8).

From a positivistic perspective, the aim of research in the field of management is to establish regulations, which govern the ways in which organisations operate. In a way, the generation of causal relationships or laws enable management to become more scientific and managers to be able to predict their environment (Johnson and Duberley, 2000). Positivists believe that only the phenomena which are observable and measurable are regarded as knowledge. Positivists are considered as objective and view the phenomena of their research as objects (Collis and Hussey, 2003). In the writings of Lex Donaldson (1997, p. 87) in strategic management argued: *“a fully positivist approach would not presume to call the approach strategic management but would rather call it corporate development. It would seek to ascertain the laws that cover corporate development that is the laws that explain changes in corporate size, diversification, geographic extensiveness, innovation and so on. Attention would be paid to material factors as explanatory variables.... The search would be for parsimonious models utilising as few variables as possible with the variables being of an objective kind. Subjective variables, including strategies would be included to fill in unexplained variance”*.

The concern of positivist research is to test theory against empirical observation. Actually positivism attempts to *“connect observations with theoretical statements constructed in rational non-observational concepts in an isomorphism of theory and observation. This isomorphism is achieved in terms of laws and theories which have been interpreted by abstractive connection to empirical events for at least some of their relevant scope* (Clegg and Bunkerley, 1980:261).

Several management scholars (e.g. Bryman, 1992; Easterby-Smith et al., 1992) focus on Aston studies in order to explain positivistic research. This is a research programme that identifies the dimensions of organisational structure and the influential factors for structure and functioning of organisations (Pugh and Hickson, 1976; Pugh et al., 1986). Pugh (1983, p. 50) identified five assumptions of the general research strategy of the Aston Studies:

1. The need for comparative studies to distinguish problems specific to particular organisations from those common to all organisations
2. Meaningful comparisons require common standards for measurement
3. The nature of an organisation will be influenced by its objectives and environments so these must be taken into account
4. Study of the work behaviour of individuals or groups should be related to the study of the characteristics of organisations in which the behaviour occurs
5. Studies of organisational processes of stability and change should be undertaken in relation to a framework of significant variables and relationships established through comparative study.

The purpose of the Aston approach is to establish measurements in order for organisations to be compared certain criteria and to factors of the organisation that influence its structure.

One of the limitations of positivism management research is that it neglects the need for relevance (Bharadwaj, 1998; Schon, 1995). Schon (1995) argued that management research is on high ground while it does not deal with providing solutions to manageable problems. Hogan and Sinclair (1996, p. 439) regarding the lack of relevance in positivist management research argued: *“Industrial psychologists have, as organisational consultants, advocated a general method that involves identifying the requirements of a job (i.e. description), identification of a set of characteristics that enable an individual to meet those requirements (i.e. prediction). These methods are rational, theoretically derived, and depend on replicable and generalisable empirical validation to determine whether or not they work. If poor choices are made, poor results are obtained. Although these methods are imperfect, organisations that utilise the basic process hire people with less adverse impact that they did 30 years ago-while simultaneously advancing understanding of the theoretical domain of job performance. This process is not simply the effective utilisation*

prediction technology; the technology is founded on certain theoretical notions concerning the nature of human performance”.

Burrell and Morgan (1979, p. 255) summarized below the criticism of positivism approach: *“Science is based on “taken for granted” assumptions, and thus, like other social practice, must be understood within a specific context. Traced to their source all activities which pose as science can be traced to fundamental assumptions relating to everyday life and can in no way be regarded as generating knowledge with an “objective”, value-free status, as is sometimes claimed. What passes for scientific can be shown to be founded upon a set of unstated conventions, beliefs and assumptions, just as every day, common-knowledge is. The difference between them lies largely in the nature of rules and the community which recognises and subscribes to them. The knowledge in both cases is not so much “objective” as shared”.*

Therefore, there is a need to change the perception about science to a more problem-or puzzle-solving approach, where science is regarded as a problem solving approach with certain conventions (Kuhn, 1970).

Post-positivism is a current approach of social research and attempts to overcome the criticism that is made of it. While positivists argue that the researcher and the researched person are independent, post-positivists accept that theories, hypotheses, background knowledge and values affect what is examined (Reichardt and Rallis, 1994). They believe in the existence of reality but they acknowledge the limitations of the researchers. Post-positivists can be viewed as recognising that positivism is dead but they maintain its respectability and authority as a research approach (Robson, 2002).

b. Paradigm

The term *“paradigm”* has been introduced by Thomas Kuhn (1970) and derives from the evolution of science and means a basic orientation to theory and research. The paradigm includes basic assumptions, key issues, models of quality research and methods for seeking answers. It explains how the social world is perceived, *“what is important, what is legitimate and what is reasonable”* (Patton, 1990, p. 37). A paradigm is defined as *“a cluster of beliefs and dictates which for scientists in a particular discipline influence what should be studied, how research has to be done and how results have to be interpreted”* (Bryman 1988, p. 4). Examples of such paradigms are positivism, symbolic interactionism, ethnomethodology and phenomenology (Sarantakos, 2005).

Burrell and Morgan (1979) have provided us with an influential understanding of epistemology and ontology of business foundations of business research. Similarly, in sociology of radical change, there is a distinction between scholars adopt the “*objective*” and the “*subjective*” views of society.

The debate comes from the publication in France in 1966 and Britain in 1969 of Louis Althusser’s work *For Marx*. “This represented the notion of an “*epistemological break*” in Marx’s work and emphasised the polarisation of Marxists theorists into two camps: those emphasising the “*subjective*” aspects of Marxism (Lukacs and the Frankfurt School) and those advocating more “*objective*” approaches, such as those associated with Althusserian structuralism” (Burrell and Morgan, 1979, p. 22).

Burrell and Morgan (1979) suggest that each paradigm contains paradigms that can be represented either as objective or as subjective.

“*Objectivist* is an external viewpoint from which is possible to view the organisation, which is comprised of consistently real process and structure. On the contrary, *subjectivist* is when an organisation is a socially constructed product, a label used by individuals to make sense of their social experiences, so it can be understood only from the point of view of individuals who are directly involved in its activities” (Bryman and Bell, 2003, p. 22). Each paradigm makes assumptions regarding the function and purpose of research, which can be either *regulatory* or *radical*. *Regulatory* is when the purpose of the research is to describe the progress of the organisation and suggest some improvements. However, *radical* is when management and business research criticise the way the organisations operate and make suggestions (Bryman and Bell, 2003).

Burrell and Morgan (1979) identified four distinct sociological paradigms: functionalist, interpretative, radical humanist and radical structural. Burrell and Morgan (1979, p. 23) regarded the four paradigms as “*being defined by very basic meta-theoretical assumptions which underwrite the frame of reference, mode of theorising and modus operandi of the social theorists who operate within them*”. The four paradigms depicted the four different views of social world based on different meta-theoretical assumptions regarding the nature of science and of society (Burrell and Morgan, 1979).

Functionalism Paradigm is the dominant framework for the study of organisations, derives from the sociology of regulation and provides rational explanations of social affairs from an objectivist point of view. It provides explanations of the status quo, social order, consensus, social integration, solidarity, need satisfaction and actuality. It approaches the following sociological concerns: realists, positivist, determinist and nomothetic (Burrell and Morgan, 1979).

Interpretive Paradigm is described as the sociology of regulation and its main concern is to understand the world as it is, the fundamental nature of the social world at the level of subjective experience. It perceives the social world as a social process which is created by individuals' consciousness and subjectivity (Burrell and Morgan, 1979).

Radical Humanist Paradigm deals with the development of the sociology of radical change from a subjectivist's point of view (Burrell and Morgan, 1979).

The organisation is viewed as a social arrangement from which individuals need to be emancipated and research as guided by the need for change (Bryman and Bell, 2003, p. 23). It regards the social world from a nominalist, anti-positivist, voluntarist and ideographic perspective and focuses on radical change, modes of domination, emancipation, deprivation and potential (Burrell and Morgan, 1979).

Radical structuralist paradigm regards the organisation as a product of structural power relationships, which lead to conflict (Bryman and Bell, 2003, p. 23).

An important feature of paradigms is that they are *incommensurable* because they are inconsistent with each other due to different assumptions and methods (Bryman and Bell, 2003), resist the hegemony of functionalist approaches, which dominate business research in North-American journals (Jackson and Carter, 1991). Reed (1985, p.205) argued that the overstatements of the differences between them leads to isolationism and reduces "*the potential for creative theoretical development*". Willmont (1993) suggested that the four-paradigm model enhances the possibilities for alternative forms of analysis with management research. The paradigm debate focuses on the relationship between epistemology and ontology in business and management research. The choice of a paradigm has implications for the design of the research and the data collection approach.

3.4 Research Design

Research design is the “*science (and art) of planning procedures for conducting studies so as to get the most valid findings*” (Vogt, 1993, p. 196). According to Yin (1984, p. 13) the methodological design has to be suitable to “(1) *the research problem, (2) the extent of control the researcher has over actual behavioural events and (3) the time-focus of the phenomena observed, i.e. contemporary or historical*”. Determining the research design the researcher will have a detailed plan which will be used to guide and focus the research. The research design includes a range of dimensions of the research process such as: expression of interrelationships between variables, generalisation of larger group of individuals than those who actually participate in the investigation, understanding behaviour and the meaning of behaviour in a specific social context and a temporal appreciation of social phenomena and their interconnections (Bryman and Bell, 2003).

There are two different approaches regarding the research design: the inductive and the deductive research approach. Inductive approach is defined as “*an approach to developing or confirming a theory that begins with concrete empirical evidence and works toward more abstract concepts and theoretical relationships*” (Neuman, 2006). The induction approach focuses on: understanding meanings of human attacks to events, understanding of research context, qualitative data, and flexible structure to permit changes, and the researcher participation in the research process (Saunders et. al., 2003). Whereas, deductive theory is regarded as a more positivistic approach to examine the relationship between theory and research.

The deduction approach focuses on scientific principles, moving from theory to data, causal relationships between variables, quantitative data and controls to ensure validity of data, operationalisation of concepts, highly structured approach, research independence and objectivity as well as samples of sufficient size (Saunders et. al., 2003). In the case of deductive approach, the researcher is aware of the existing literature in a particular field and develops hypotheses in order to empirical examine them. Testing is concerned with validating or disconfirming existing theory. The scholar develops propositions, which are logical conclusions or predictions derived from theory. Then, he/she collects data pertaining to the propositions. The propositions are tested by comparing findings from observed reality (the collected data) with the expected outcome (theoretical propositions) (Bryman and Bell, 2003). Social scientists deduce a hypothesis and then translate it into

operational items and they explain how data can be collected in relation to the concepts that make up the hypothesis. This view of the role of the theory is that it is close to the work of Merton (1967, p. 39) who argued that middle-range theory “*is principally used in sociology to guide empirical inquiry*”.

“Deductive research approach entails the development of a conceptual and theoretical structure prior to testing through empirical observation (Gill and Johnson, 2002, p. 34).”

The theory and the hypotheses deduced from it come first and drive the process of gathering data (theory, hypothesis development, and data collection, hypothesis confirmed or rejected). The theory can be rejected or confirmed. In the case that theory is confirmed, then the researcher feels that his/her theory is a reasonable reflection of reality.

Yin (1984) has divided the theoretical propositions into two basic categories: deductive those that are pattern matching and explanation building and inductive those that data display and analysis, grounded theory and narrative analysis. Popper (1967, pp. 130-43) claimed that “*to many researchers working within the deductive tradition, the source of one’s theory is of little significance- it is the creative element in the process of science that is essentially unanalysable*”. The logic of reduction and the operationalisation process and the hypothesis testing through empirical evidence is important.

In this study, the key strategic decisions factors and the hypothesised relationships between them can be identified via thorough literature review (Chapter 2). The main objective of this study is to determine the relationships among strategic decisions factors. In the current study, the deductive approach was considered as the most appropriate in order to test the theory through empirical investigation. Given the structured nature of the research problem and the fact that there is sufficient evidence to formulate hypotheses for testing, the research design that is adopted for the purpose of our study is cross-sectional. Cross-sectional is a widely used research design in social sciences studies which is associated either with questionnaires or structured interviews. It entails the collection of data (qualitative or quantitative) with more than one case (usually more than fifteen) within a specific period of time in order to detect associations between variables (Robson, 2002). Based on the formulated hypotheses, the quantitative survey is applied for the current study. After a thoroughly literature review in strategic management, comparing and evaluating the research design of similar studies, a research hypothesised model (Figure 3:1). Therefore, a conceptual and analytical framework was developed using existing

theory and then this framework was tested in order to explain the empirical findings. Based on the hypothesised model (see Figures 2:3-2:8), quantitative approach is conducted to assist the measures development of the constructs. In this case, dependent and independent variables were used to explain the cause and effect relationships between the variables (Yin, 1984).

The primary data for the current study was collected through questionnaires to boards' members of Greek companies. This is the first reported study that has empirical data from Boards of Directors of listed companies in Greece. The questionnaires were translated into Greek language as well as and they have been pretested in a few Greek executives prior to their distribution. Additionally, secondary data was collected from companies' annual reports. Figure 3:1 shows the design of the research. The Figure 3:2 below presents the method of selecting the most appropriate source of data and data generation method. Table 3:2 and Table 3:3 describe the pre-test process of the questionnaire as well as the questionnaire development process.

Figure 3:1 Research Design

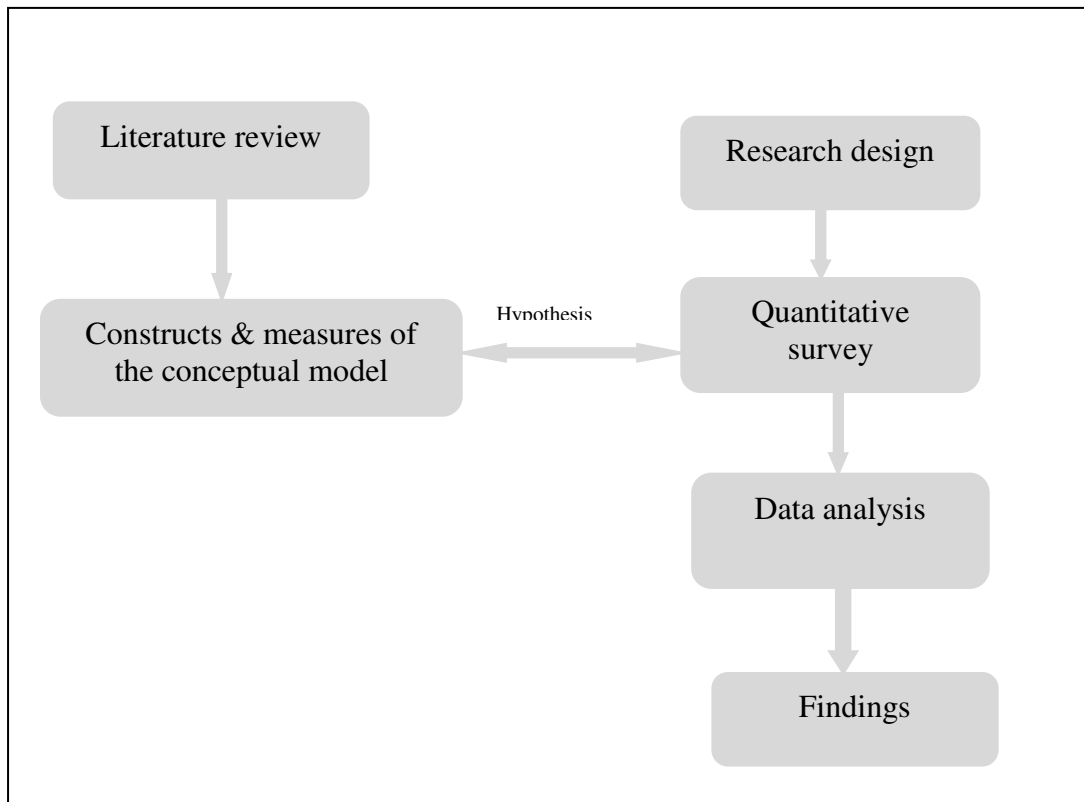
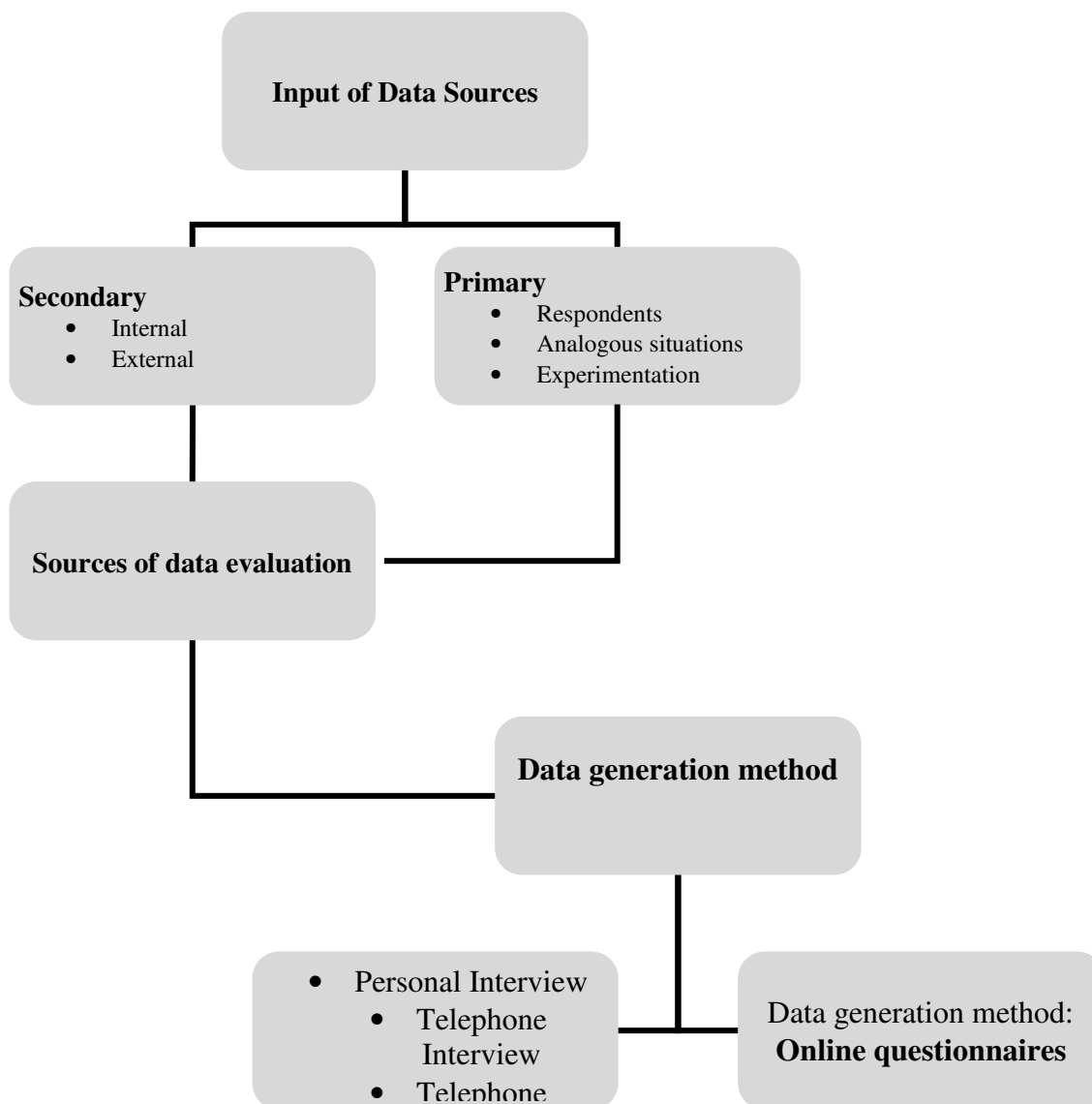


Figure 3:2 The Process of Selecting the Most Appropriate Source of Data and Data Generation Method.



3.5 Data Generation Sources and Communication Method

3.5.1 Introduction

The undertaken study is characterised as quantitative survey research and uses a cross-sectional research design in order to gather information regarding Boards of Directors in Greek listed firms on the Athens Stock Exchange (ASE) and then evaluate and examine the collected data to discover patterns of interrelationship between the variables (Bryman and Bell, 2003). Data sources are generally divided into two categories: primary and secondary. The information gathered for the research will be primary and secondary data.

3.5.2 Secondary Data

Secondary data have been described as data already generated but published for some reason other than solving the research problem at hand, while primary sources refer to generation of data, which relate specifically to the research problem. It refers to information offered in either written or electronic form and is divided into internal or external based on the source of information (Blumberg et al., 2005).

For research purposes, secondary data were collected from “*documentary-based secondary data that refer to information collected from previous similar researchers which have also included primary data and have already been analysed for their original purpose*” (Saunders et al., 2003). Secondary data can be gathered by various sources such as: books, periodicals, government sources, regional publications, companies’ annual report, media and commercial sources (Zikmund, 2003).

In this research, secondary sources were gathered from the Athens Stock Exchange where all Greek organisations are quoted as well as Nautemporiki, ICAP Consulting, Ernest and Young Consulting, Kantor Consulting and Hellenic Capital Market directory.

Secondary data have some essential benefits: cost and time, high quality, opportunity for longitudinal analysis, subgroup and subset analysis, opportunity for cross-cultural analysis, more time for data analysis, reanalysis may offer new interpretations. However, secondary data have to be considered under the light of their limitations: lack of familiarity with data, complexity of data, no control over data quality and absence of key variables (Bryman and Bell, 2003).

3.5.3 Primary Data

Primary data refer to the generation of sources, which are related specifically to the research problem. Kinner and Taylor (1991) have described three sources of primary data as being respondents, analogous situations and experimentation. The analogous situation and experimental design options were considered unsuitable because of the number of inherent methodological limitations and their perceived lack of effectiveness for the purpose of our study. The respondent source is considered more appropriate, for our study on the basis that: *“When the information needs of a study require data about respondents’ attitudes, perceptions, motivations, knowledge, and indented behaviour, asking people questions is essential”* (Kinner and Taylor, 1991, p. 135). Traditionally, the methods for data generation are observation techniques, personal interviews, protocol research and postal questionnaires.

3.5.3.1 Interviews

Bryman and Bell (2003) have divided interviews into the following major categories: structured interview, standardised interview, semi-structured interview, unstructured interview, intensive interview, qualitative interview, in-depth interview, focused interview, focus group, group interview, oral history interview and life history interview. In this research, structured interviews were conducted where the questionnaire was explained to the respondents and then, to questions were asked following the sequence of the questionnaire.

Structured interview or otherwise standardised interview entails the administration of an interview schedule by the interviewer. The purpose is for all interviewees to be given the same questions and them to reply to the questions. Questions are very specific and they offer the interviewee a fixed range of answers (closed, closed ended, pre-coded or fixed answer) (Bryman and Bell, 2003).

Personal interviews are associated with favourable response rates, high levels of flexibility and control during the interview, greater complexity and range of potential questions made possible, and spontaneous rich information obtained immediately as well as ability to correct misunderstanding of respondents. However, in contrast to alternative communicative methods personal interviews are regarded as expensive, demanding a

sustainable degree of administration, offering less assurance of anonymity, to the respondent, involving a considerable level of inconvenience, sensitivity to certain issues and providing more opportunities for response error with interviewer (Brenner *et. al*, 1985; Bryman and Bell, 2003).

3.5.3.2 Protocol Research Approach

In business research protocol analysis is a data collection method used to identify the mental processes in problem solving and is associated with phenomenological methodology (Collis and Hussey, 2003; Newell and Simon, 1972).

Verbal data can be generated either by retrospective verbalisation when the participant is asked to describe processes after they occurred or by concurrent verbalisation which occurs when the participant is asked to describe and explain thoughts as they undertake a task. Concurrent verbalisation is distinguished into two types: directed reports: where participants describe only behaviours and think-aloud protocol: where participants are asked to think aloud when performing a task (Collis and Hussey, 2003).

Smagorinsky (1989, p. 475) described protocol analysis as “*an expensive and meticulous research method that has its share of growing pains*”. Smagorinsky (1994) used protocol to study writing and Bolton (1991) used concurrent verbal protocols in order to pre-test questionnaires. Bolton (1991, p. 565) argued that protocol analysis facilitates evaluation of draft questionnaires and but it is also “*time consuming and labour intensive*”.

3.5.3.3 Postal Questionnaire

There are three main types of survey data collection: self-completion or postal questionnaires, face to face interview and telephone interview (Robson, 2002).

Questionnaires are associated with both positivist and phenomenological methodologies. Questionnaire is characterised a list of structured questions, chosen after examination, in an attempt to choose reliable responses from a chosen sample.

According to the positivist paradigm, questionnaires can be used for large scale surveys. Each questionnaire can be coded at the design stage and when it is completed to be processed. Positivist approach suggests closed questions, while the phenomenological approach suggests the open-ended questions (Collis and Hussey, 2003).

This method of data generation is regarded as reliable in assuring respondent anonymity, demanding low levels of administrative requirements (cheap to administer, quicker to administer), possessing a high degree of standardisation and accessibility, absence of interviewer effect, convenience for respondents and not particularly resource-laden. However, recognised limitations are the investigator's lack of control over the questionnaire completion process, low response rate, limited volume of data capable of being generated and the possibility of biases being present in the sample frame, greater risk for missing data (Bryman and Bell, 2003; Paxson, 1992; Chawla and Natarajan, 1994).

3.5.3.4 Online Surveys

Online surveys are in their infancy but they have a great potential. Online surveys are distinguished into two categories: e-mail surveys and web surveys. E-mail surveys fall into two categories again; embedded and attached questionnaires sent by email. Sheehan and Hoy (1999) argued that email surveys are likely to be applied to smaller and more homogeneous groups while Web-based surveys focus on large groups of online users. The embedded questionnaire is easier to fill in since it requires less computer literacy however, its appearance is dull and featureless (Bryman and Bell, 2003). The attachment e-mail allows to the respondent to type material on it. Dommeyer and Moriarty (2000, p. 48) commented that "*the attached e-mail survey presents too many obstacles to the potential respondent*", including virus threat, unfamiliarity with this research approach. In addition, web-based survey is an online survey which can be completed through a website. As a method it offers a wider variety of embellishments in terms of appearance, although it requires an advanced knowledge of HTML (Bryman and Bell, 2003).

Despite the fact that online survey approaches have increased response rates compared to postal questionnaires, Yun and Trumbo (2000) claimed that "*the electronic only survey is advisable when resources are limited and the target population suits an electronic survey*". Scholars (e.g. Cobanoglu et al. 2001; Kent and Lee, 1999; Schaeffer and Dillman, 1998) regard on-line surveys as a low cost and fast response administration technique with limited unanswered questions. On the contrary, they are limited to online population, require additional motivation from the respondent and have a low degree regarding confidentiality and anonymity issues.

3.5.4 Triangulation

Triangulation is considered as a valuable and widely used strategy. Denzin (1978, p. 291) defined triangulation as: “*the combination of methodologies in the study of the same phenomenon*”. Researchers use triangulation in an attempt to enhance the accuracy of their judgments by collecting data from different sources (Jick, 1979). Triangulation is employed because it addresses all possible aspects of the topic, increases the amount of research data, and achieves a high degree of validity, credibility and research utility, while it overcomes the limitations of single-method studies (Bryman and Bell, 2003).

Robson (2002) has divided triangulation into four different types: *data triangulation*, *observer triangulation*, *methodological triangulation* and *theory triangulation*. In this our study, data triangulation and methodological triangulation were employed since questionnaire were distributed, some complementary structured interviews were conducted and data from secondary sources were gathered.

Data triangulation is defined as the use of more than one method of data collection (e.g. observation, interviews, documents). Additionally, theory triangulation is defined as the use of multiple theories or perspectives (Robson, 2002). Lamnek (1993, pp. 245-57) has criticised triangulation by arguing that it can be useless if it is based on wrong conditions, is used as a way of legitimatising personal views and interests, is difficult to replicate and is not suitable for studying every social phenomenon. In this research work, data collection triangulation approach was applied since mainly primary data but also secondary data concerning the board composition were collected. Primary data were collected mainly through e-mail surveys and secondary data through companies’ annual reports.

3.5.5 Response Issue

E-mail attached questionnaire is regarded as an accepted and familiar method for systematic survey methodology taking into consideration that is a low cost and fast response method as well as that the respondents are well educated and have computer literacy. In addition, no part of the information requested in the questionnaire is regarded as particularly commercially sensitive, implying that sampling units would not be averse to responding on grounds of disclosure and confidentiality. Finally, the majority of empirical studies in management have adopted a questionnaire survey method (Kumar et al., 1993).

Mangione (1995, pp. 60-61) has provided the following classification of response rate: over 85% excellent, 70-85% very good, 60-70% acceptable and below 50% not acceptable. It is well known that questionnaires are associated with low response rates. Therefore, the questionnaire should be followed by a detailed cover letter and cover page which will provide instructions regarding the research subject, the researcher's and supervisor's details, types of questions, necessary time to be completed not only to increase the response rate but also to facilitate the procedure for the respondents. Furthermore, it was made clear that all information obtained from the particular survey will remain absolutely confidential. Finally, in the last page respondents were able to express their opinion and to indicate if they are keen on receiving the results of the survey. In addition, the researcher has to contact the respondent by telephone after two to four days and explain the purpose of the project (Bryman and Bell, 2003).

3.5.6 Methodological Issues

Questionnaires offer great assurance of anonymity, limit the risk for bias or errors caused by the behaviour of interviewer, offer an objective view of the issue since respondents prefer to write rather than to talk about certain issues. In addition, questionnaires allow a wide coverage since researchers can approach respondents more easily (Sarantakos, 2005). Also, constructs and variables depicted in the conceptual model have been clearly defined within the relevant literature and the measurements for each construct were reasonably developed. This study requires a self-administered respondent approach because there is no necessity to consider a direct control over the physical data generation method.

3.5.7 Questionnaire Instrument Issue

Selltiz (1981) states that a structured standardised method can increase the response rate since it provides greater anonymity and the respondent will have more time to think for their responses. The length of the questionnaire is a critical factor for the success of data generation. The researcher has to bear in mind the length of the questionnaire without any compromise in the operationalisation of the constructs (Churchill, 1991).

3.5.8 Sampling Issues

The purpose of the study is to examine how Greek executives pursue strategic decisions in Greek listed firms; therefore, it is important to elicit answers from a large sample of Greek firms in order to assure validity and reliability. The sample frame was Greek organisations listed in the Athens Stock Exchange. A list of 316 companies from the Athens Stock

Exchange (ASE) was derived, since it is the sole official market of shares trading in the Greek capital market. Companies that were de-listed were excluded and the remaining sample frame consisted of 290 firms. In the late 2007, we sent questionnaire to board members of 290 firms. One hundred and five companies returned completed questionnaires for an overall response rate 39.6%.

Quoted companies are classified into 53 economic activity related sectors, which fall into twelve categories: primary production, manufacturing industries, public services, retailers, hotels-restaurants, transport and communication, financial-accounting services, real estate and commerce activities, health and social care, general services, constructions and transitional category.

For the purpose of the study a snowball sampling technique was used to identify boards' members of Greek listed organisations that are involved in the strategic decision-making process. Snowball sample is used to contact individuals for whom there is no sample frame (Bryman and Bell, 2003). Similar studies in the strategic management field have used the same approach (Franwick et al., 1994).

The appropriate sample size of the each study is hard to determine. A small sample could be a waste of effort because it cannot provide significant effects (Kerlinger and Lee, 2000). Many studies suggest a ratio of fifteen to twenty observations for each independent variable. A general rule is that the ratio should never fall below 5 to 1, meaning that there should be five observations for each independent variable (Hair, Anderson, Tatham and Balck, 1998).

For the purpose of the study, the researcher has used the method of response rate calculation proposed by the Council of American Survey Research Organisations (CASRO, 1982) which assumes that the percentage of ineligible responses among non-respondents is equivalent to that in the respondent set. Table 3:1 illustrates the mathematical method of calculation.

Table 3:1 Survey Response Rate Statistics	
Total number of sampling units	290
Total number of respondents	115
Total number of eligible respondents	105
Total number of ineligible respondents	10
Percentage of eligible firms= $105/115$	91.30%
Total number of non-respondents (290-115)	175
Expected percentage of eligible firms in non-respondents= $175*(105/115)$	160
Response Rate=$(105*100)/(105+160)$	39.6%

The response rate was considered acceptable and compares favourably with other studies on Top Management Teams in strategic decision-making (Papadakis, Lioukas and Chambers, 1998; Elbanna and Child, 2007).

The questionnaire was distributed initially to board members of Greek organisations in April and then we have conducted a follow-up process of the questionnaire which took place by the end of May 2007. Researchers should assess for any potential non-response bias in the data set. Armstrong and Overton (1977) suggested that a formal extrapolation test should be conducted in order to compare early and late survey respondents. The sample framework of this study consists of corporate elites of Greek organisations. Greek executives have a heavy schedule and are quite reluctant to reveal confidential information of their organisation. Therefore, a snowball technique has been applied and the researcher has approached consulting and auditing companies asking them to distribute the questionnaire to board members. The researcher could not estimate the exact time that the board members took to receive the questionnaire, fill it in and return it. Therefore, the researcher could not assess any potential non-response bias in the data set.

3.5.9 Research Constraints

The limitations of survey techniques are the data that are affected by the respondents who did not report their beliefs and attitudes accurately (Robson, 2002). E-mail attached questionnaires did not provide opportunities for motivating the respondent to participate in

the survey. Researchers are not sure whether the right person has completed the questionnaire. Finally, due to the lack of guidance, researchers are not sure if the questionnaire is completed in the right order and also, partial response is possible (Sarantakos, 2005). Important constraints for the researcher are time and cost, therefore we have chosen on-line questionnaires.

3.6 Questionnaire Development Process

The effective administration is vital to the achievement of an acceptable response rate (Walker et al., 1987). Literature on questionnaires suggests a survey pre-notification (e.g. Heaton, 1965; Ford, 1967; Murphy et al., 1990) and following ups mailings (Pucel et al., 1971; Paxson, 1992). Many scholars have proposed various survey approaches (Kimball, 1961; Churchill, 1991). Dillman (1978) developed an influential survey approach by introducing the total design method (TDM) of survey administration. Dillman's administration approach is related to mail questionnaires but the procedures are similar to the web surveys (Dillman, 2000). After reviewing 200 mail questionnaires, Dillman (1978, pp.7-8) stated: *"Implicitly, although probably not intentionally, researchers assumed that respondent behaviour is primary a reaction to particular aspects of mail questionnaire studies, rather than a reaction to the whole. It is more correct to assume that the decision to respond is based on an overall, subjective evaluation of all the study elements visible to the prospective respondent. The nature of any survey is communicated to respondents in diverse ways: the shape, size and colour of the envelope; the way the address is affixed to the envelope; content and appearance of the questionnaire; and so on. Each element contributes to the overall image of the study. This suggests that to maximise response rate all aspects of a study should be designed to create the most positive image"*.

Dillman's method is used to improve validity, usefulness, cost-effectiveness, reduce all types of errors and maximise response rate. TDM survey consists of two parts. The first presents the survey process which affects the quality and quantity of response and the second presents the survey activities and the design implementations. The second part deals with the physical process of survey design in the form of an administrative plan. Dillman's model has the following steps: development, questionnaire construction and survey implementation.

Concerning the questionnaire design, Dillman (1978) recommended: clear instructions and attractive layout, ordering the questions according to the topic, choose the first question, formulate the pages, establish a vertical flow, provide directions for how to answer, use graphical design and numerous question-writing principles to ease the task of reading and answering questions, booklet format, use photocopier to reduce the size of the questionnaire, personalisation of correspondence, designing the front cover, designing the back cover, pretesting, follow up two weeks after the original mailing, a first replacement questionnaire and cover letter after the first mailing, a second replacement questionnaire accompanied by cover letter seven weeks after the first one.

3.6.1 Pilot Study

Researchers have used numerous procedures to pre-test a questionnaire. Pilot study is an instrument employed by quantitative researchers in business field before the actual data collection. It is regarded as a small-scale replica and a rehearsal of the main study, since it deals with administrative and organisational problems of the whole study. Several scholars (e.g Oppenheim, 1992; Sproull, 1988) have analysed the following goals of pilot studies: the costs and duration of the main study, effectiveness of the study's organisation, suitability of research methods and instruments, response rate, ascertain the degree of survey population, discover weaknesses and limitations.

In this research, before the distribution of questionnaires, a pilot study to representative firms was conducted in order to test the response of the subjects to the overall research design. Dillman (1978) suggested that the pilot study is carried out in order to ensure that the questions measure what they are supposed to, the questions are interpreted similarly by all respondents, close-ended questions are applied to all respondents, the questionnaire creates a positive impression, questions are answered correctly and the questionnaire does not suggest any bias.

Adopting Dillman's pretesting method, two versions of the questionnaire were constructed (English and Greek). Although Greek executives are well educated, questionnaires have been translated into Greek in order to increase the response rate. The Table 3:2 summarises the steps of pretesting procedures adopted by Dillman (2000) that the researcher has followed.

Table 3:2 Survey Pilot Process (Adopted by Dillman, 2000)

Stage 1	Questionnaire has been tested by executives with academic affiliation to ensure question completeness, efficiency, relevancy and format appropriateness.
Stage 2	Observation and “think loud” protocols test if the respondents could complete the survey. Interviews have been conducted as well.
Stage 3	Small pilot study that completed all the procedures proposed in the main study.
Stage 4	During the last revision process, researchers have checked for typos and errors prior to the questionnaire distribution.

When collecting data in one language and presenting the findings in another, researchers have to make a number of translation-related decisions. Important techniques for eliminating translation-related problems include back translation, consultation and collaboration with other people during the translation process and pre-testing or piloting (for example, interviews) whenever this is possible. Back translation was used for the purpose of the study. Back translation is a common technique used in cross-cultural research which involves looking for equivalents (Ercikan, 1998, p. 545; Warwick and Osherson, 1973, p. 30). This is done by:

- the translation of items from the source language to the target language
- independent translation of these back into the source language
- *‘the comparison of the two versions of items in the source language until ambiguities or discrepancies in meaning are clarified or removed’*

Brislin et al. (1973) suggested the following five translation techniques for cross-cultural studies:

- comparisons of meaning between the original and back-translated forms
- comparisons of meaning, by bilinguals other than the translator, between the original and translated form
- answering questions written about the content of the original version; the questions should be answered correctly by people who have read only the target version

- comparing performance to instructions written in the original and in the target language
- Administering both versions of attest or questionnaire to a sample of bilinguals.

These techniques are incorporated in our translation. In the back translation process of our questionnaire four bilingual academic members of staff from Brunel and Cardiff University were voluntary participants.

A pilot questionnaire was distributed to few Greek executives in order to ensure question completeness, efficiency and format completeness. The pilot questionnaire was distributed in the beginning of March 2007 (Appendix A). Eight executives from Greek listed organisations in the ASE completed this questionnaire. The purpose was to test that its tools were correct, suitable, reliable and valid. The Greek executives that we chose for our pilot study were also members of Greek academic community who have the knowledge to make recommendations regarding the questionnaires. In fact, the pre-test questionnaire allowed us to get constructive feedback for the questionnaire. Greek executives provided numerous insightful recommendations regarding question wording, elimination of several questions, replacement of questions, and format of questions.

It is worth mentioning the pilot study was conducted, the respondents suggested that two characteristics of strategic decision-making process be omitted in the final questionnaire. The politicisation and problem-solving dissension include certain elements that were difficult to be fully understood by the Greek managers. Therefore, they have been incorporated in the construct of strategic decision-making.

All these issues were adhered to in the final questionnaire used for the data generation in this survey which was distributed to Greek listed organisations in April 2007 (Appendices B and C). The figures from the pilot study have not been included in the final data set. The purpose of conducting a pilot study was to ensure that the respondents understand the questionnaire and not to collect data.

Two weeks after the first round of the email questionnaire, we started the follow-up process of the questionnaire accompanied by cover letter explaining the importance of the study. The second follow up of questions took place at the end of May 2007. In order to convince executives to fill in our questionnaire, we made numerous telephone calls and 10 personal visits to the companies. The procedures of survey development and survey implementation are presented in Table 3:3.

Survey Development	Questionnaire design	<ul style="list-style-type: none"> • Ordering questions including cover letter. • Description of the importance of the study. • Use of graphic and photo reduction • Consistent use of large and small letter and different color schemes • Attach the questionnaire to the email
	Pilot Questionnaire	<ul style="list-style-type: none"> • Send out pilot questionnaire • Analyse the feedback from the pilot • Finalise the questionnaire according to the feedback
Survey Implementation	Questionnaire Distribution	<ul style="list-style-type: none"> • Check and back up the responses from time to time • This process last for two weeks
	Questionnaire follow-up	<ul style="list-style-type: none"> • Analyse responses from the first round, try to identify the reason why some respondents have not fill it in the questionnaire. • Explain the importance of the study again and that all information are treated confidentially • Check and back up the responses from time to time. • This process lasts two-four weeks.
	2 nd Questionnaire follow-up	<ul style="list-style-type: none"> • Final reminding to the recipients to answer the questionnaire. • Check and back up the responses from time to time.

3.6.2 Ethical Consideration and Confidentiality

It is quite important in the early stage of the study to take into consideration the ethical aspects of the proposed study. Ethics refer to the rules of conduct codes or set of principles (Reynolds, 1979). The research was conducted according to the economic and social research council (ESRC) research ethics framework. In the current study, the participants were informed about the nature and purpose of the study and they were assured about the anonymity and the confidentiality of the data. Both English and Greek versions of the questionnaire were designed according to ESRC ethical guidelines. Prior to the distribution

of the questionnaire to the participants, the questionnaires received the ethical approval from Brunel University Ethics Committee.

3.7 Conceptualisation and Operationalisation of Variables

Researchers use the following sequence for quantitative research: first, conceptualisation, followed by operationalisation, followed by applying the operational definition or measurement in order to collect data (Neuman, 2006).

Conceptualisation is “*the process of taking a construct and refining it by giving it a conceptual or theoretical definition*” (Neuman, 2006, p. 182). Operationalisation is defined as “*the process of converting concepts into empirical referents, or of quantifying concepts for the purpose of measuring their values, such as occurrence, strength and frequency*” (Sarantakos, 2005). Actually, it is employed when concepts are abstract or unclear and translates these constructs into synonymous empirical referents.

3.7.1 External Corporate Environment

Environment is an important parameter in both strategy and organisational theory since it is related to the evolution and performance of the organisation (Romanelli and Tushman, 1988). Researchers have investigated environment through two different perspectives: information uncertainty and resource dependence (e.g. Duncan, 1972; Tung, 1982; March and Simon, 1958). Emery and Trist (1965) suggested a typology of four types of organisational environments: placid, randomised environment; placid, clustered environment; distributed-reactive environment and turbulent fields. Aldrich (1979) identified six dimensions of organisational environments: capacity, homogeneity-heterogeneity, stability, concentration, consensus and turbulence. Dess and Beard (1984) condensed Aldrich’s dimensions into three: munificence, dynamism and complexity.

Environment can be measured either by objective (Aldrich, 1979) or by perceptual measurements (Weick, 1969). Objective environments are relevant to primary strategy making (domain selection), while perceived environment is input to secondary strategy making (domain navigation). Current literature suggests that there are two perceptions of organisational environment, first, it is the task environment, which is defined as all aspects of the environment “*potentially relevant to goal setting and goal attainment*” (Dill, 1958, p. 410). Second, the environment that focuses on large corporate systems is called institutional environment and includes societal, demographic, economic, political and

international elements (Scott, 1987). Tan and Litschert (1994), Khandwalla (1977), Jauch, Osborn and Glueck (1980) examined eight environmental segments: competitors, customers, suppliers, technological, regulatory, economic, socio-cultural and international. Respondents were asked to rate their perception in terms of environmental circumstances: hostility, dynamism and complexity. Respondents were asked to evaluate the following statements according to the above eight environmental segments:

1. to what extent do you think that these factors have impact on your firm?
2. to what extent do you think that factors have become more favourable to your firm?
3. to what extent do you think these factors have become more predictable?
4. in each sector, how much change have you observed in last five years?
5. in each sector, how many factors does your firm need to deal with ?
6. following the previous question, are those factors different from or similar to each other?

A seven-point scale was used in order to measure environmental hostility, dynamism and complexity (1" for similar, "4" for about middle and "7" different).

Other scholars have attempted to measure different types of environment using the following operationalisations:

Environmental Dynamism/instability: Three values are used in order to capture environment: 1.dynamism in marketing practices, 2. competitor dynamism and 3. customer dynamism. Each scale is measured in a 7-point Likert-type scale ranging from "1" (no change) to "7" (very frequent changes) (Achrol and Stern, 1988). The concept of instability refers to volatility or difficult to predict discontinuities in the industry (Aldrich, 1979). Volatility is measured by the following indicators: 1. net sales and 2. operating income in the dominant industry over the period 1969-73 (Keats and Hitt, 1988).

Environmental Munifence-Hostility: is measured by the following indicators: 1. riskiness, 2. stressfulness and 3. dominance over the company (Khandwalla, 1977).

According to Aldrich (1979), environmental capacity, which is called by Dess and Beard (1984) "*munifence*", refers to the availability of resources to support growth. The primary indicator of growth is the industry sales or market sales (Dess and Beard, 1984).

Keats and Hitt (1988) measured munificence by net sales and operating income in the dominant industry over the period 1969-73.

Turbulence: Miller, Burke and Glick (1998) developed the following statements and they asked the respondents whether they agree or disagree. Each statement was ranged between “1” strongly disagree to “7” strongly agree. The following indicators are used to measure turbulence: 1. products/services become obsolete very slowly in your firm’s principal industry, 2. your firm seldom needs to change its marketing practices to keep up with competitors. 3. consumer demand and preferences are very easy to forecast in your firm’s principal industry and 4. your firm must frequently change its production/service technology to keep up with competitors and/or consumer preferences.

For the purpose of our study, we have adopted the measurements of Tan and Litschert (1994), Khandwalla (1977), Jauch, Osborn and Glueck (1980) in order to capture environmental dimensions.

3.7.2 Board Structure

Board Size represents the number of board members. It is defined as the absolute number of directors in the boards (Judge and Zeithaml, 1992; Ruigrok et al., 2006; Golden and Zajac, 2001; Muth and Donaldson, 1998; O’Sullivan and Diacon, 1999; Dalton et al., 1999; Cahan et al., 2005; Goodstein et al., 1994; Randoy and Jensen, 2004; Beiner et al., 2004; Filatotchev, 2005).

Outside or External Directors are characterised as those with no relationship with the firm (Daily and Dalton, 1997; Mallette and Fowler, 1992). Outside director proportion is measured by counting the absolute number of outside directors with no personal or professional ties to the firm (Daily and Dalton, 1997; Cochran, Wood and Jones, 1985; Goodstein, Gautam and Boeker, 1994; Beiner, Drobetz, Schmid and Zimmermann, 2004; Bergh, 1995).

Inside or Internal Directors are characterised those that are employees of the firm (Harris and Shimizu, 2004). Inside directors are measured by the number of insiders in the board divided by board members (Cahan, Chua and Nyamori, 2005; Johnson, Hoskisson and Hitt, 1993; Certo, Covin, Daily and Dalton, 2001).

Independent Directors are characterised as the outside directors with no personal or professional relationships with the organisation (Daily and Dalton, 1997). Independent directors in this study are defined as the individuals with no ties with employees or managers of the firm.

Interlocking Directorates: are characterised as the directors that serve simultaneously to more than two boards (Kiel and Nicholson, 2003). Ruigrok, Peck and Keller (2006) as well as Kiel and Nicholson (2003) defined as interlocking directorship the situation where an individual simultaneously has a mandate on the Board of Directors and the Management Team of two or more companies, which are adopted for the purpose of the study.

Executives Versus Non-Executive Directors: Non-executives are board members with no executive responsibilities who are appointed as part-timers in order to protect shareholders' interests while executive directors are regarded as full time employees that are responsible for the organisational strategic and operational aspects (Weir, 1997). Staikouras et al. (2007) defined executives as directors who are currently employed by the firm, related company officers or immediate family members of firm employees. Non-executive directors are members of the board who are not top executives, retired executives, former executives, relatives of the CEO or the chairperson of the Board, or outside corporate lawyers employed by the firm. For the purpose of the study, the above measurements for executive and non-executive directors are adopted.

Board Leadership Structure or CEO Duality: occurs when the same person holds both the CEO and Chairperson's positions in an organisation (Rechner and Dalton, 1991). Board leadership structure is characterised as a binary variable coded as "0" for those firms employing the joint structure and "1" for those firms employing the separate board leadership structure, measurement that has been adopted by various researchers and us (e.g. Daily and Dalton, 1993; Kesner and Johnson, 1990; Rechner and Dalton, 1991; Muth and Donaldson, 1998; Petra, 2005; Boyd, 1995; Vafeas and Theodorou, 1998, Kiel and Nicholson, 2003).

Gender: In this study, respondents were asked to count the overall number of male and female board members.

3.7.3 Boards of Directors' Demographic Characteristics

Age is measured as the chronological age of the executive (Thomas, Litschert and Ramaswamy, 1991; Muth and Donaldson, 1998; Guthrie and Datta, 1997; Datta and Rajagopalan, 1998; Davidson, Worrell and Cheng, 1990; Herrmann and Datta, 2006). In the study, the age of the board members is calculated as the average age of the executives. Responses are grouped in nine categories, each covering a period of five years, starting from a class of 25 to 29 and ending with a class of 65 and above.

Educational Background: Educational background of top management team is defined as the executives' fields in the highest level of education (Thomas and Ramaswamy, 1996; Hitt and Tyler, 1991).

Finkelstein (1988) measured CEO education background using the following 7-point scale based on the highest degree earned by the CEO: 1=high school, 2=some college, 3=undergraduate degree, 4=some graduate school, 5=master's degree, 6=attended programme and 7=doctoral degree. For the purpose of the study, the above measurements are adopted and modified according to the Greek reality. Educational background is measured by using a 4-level scale: 1=high school, 2=bachelor's degree, 3=college 4=master's degree and 5=doctoral degree. In addition, respondents were asked to indicate the area of highest educational background from eight modified disciplines used by Hambrick, Seung Cho and Chen (1996): engineering, sciences, business administration, business, social sciences-economics-sociology, marketing, civil engineering and other.

Functional Background: Top management team functional background is defined as the area in which top management team had spent more years (Carpenter and Fredrickson, 2001; Michael and Hambrick, 1992). Functional background is distinguished into the following eight categories: 1. production –operations, 2. R&D and engineering, 3. accounting and finance, 4. management and administration, 5. marketing and sales, 6. law, 7. personnel and industrial relations, 8. other (Carpenter and Fredrickson, 2001; Michael and Hambrick, 1992). Hambrick and Mason's (1984) attempted to categorise the functional background according to sixteen categories Chief Executive Officer, Chief Operations Officer, Finance/Treasurer, Planning, Personnel, Public Affairs, General Counsel/Secretary, Operations/Field Service, Marketing/Sales/Customer Service, Information Systems, International, Maintenance/Field Service, General Management,

Other Corporate Staff, Accounting /Controller and Other. Following Hambrick and Mason (1984) classified functional backgrounds into two categories: throughput functions (coded as “0”) for marketing, sales, merchandising as well as product research and development (R&D) and non-throughput functions (coded as “1”) such as: productions/operations, engineering, finance and accounting. In this study, respondents were asked to specify their functional background within the following seven categories:

finance treasurer, general management, information systems, marketing/sales/customer services, accounting/controller, manufacturing and sales and engineering.

Industry Tenure: Industry tenure is defined as the number of years that the executive has been employed in a specific industry (Hambrick, Geletkanyez and Fredrickson, 1993; Geletkanyez and Black, 2001).

Organisational Tenure: Iaquinto and Fredrickson (1997) as well as Hambrick, Geletkanyez and Fredrickson (1993) defined it as the number of years an individual has worked for this organisation. This is the common definition of organisational tenure, which has been adopted by most researchers (Finkelstein and Hambrick, 1990; Thomas, Litschert and Ramaswamy, 1991, Hambrick et al., 1996; Singh and Harianto, 1989b; Schnake et al., 2005; Herrmann and Datta, 2006). Greek executives’ organisational tenure was computed as the average organisational tenure of board members.

Position Tenure: defined it as the number of years the executive has spent in the current position (Hambrick, Geletkanyez and Fredrickson, 1993). In this study, the measurements used by various scholars are adopted (Smith *et al.* 1994; Ocasio, 1994; Young and Buchholtz, 2002) and Boards of Directors were asked to specify the number of years that they have been serving the company from the current position.

International Experience was calculated by the number of years the executives have spent abroad (Sambharya, 1996; Hermann and Datta, 2006).

Female Directors: Female ratio was measured as the ratio of female directors to total directors (Bonn et al., 2004).

3.7.4 Involvement in the Strategic Decision Making

Involvement in strategic decision-making is an abstract construct and therefore, it is difficult to be measured. Board involvement has been divided into two categories formation phase and evaluation phase (Judge and Zeithaml, 1992).

Fama and Jensen (1983) measured board involvement by asking the executives of each company to assess the degree to which the board is involved in decision management and decision control with the following questions: how often do board member initiate issues on the agenda, how often does Board of Directors change solutions suggested by the CEO, how often do suggestions for solutions originate within Board of Directors and finally, how often does Board of Directors conduct a follow-up review of a large investment? An ordinal scale range from one (“almost never”) to five (“almost always”) is used in order to evaluate the extent to which Boards of Directors involve in the strategic decision –making. The first three items indicate a high level of involvement in decision-making and the fourth and fifth item indicate a high level of involvement in decision control Fama and Jensen (1983).

Judge and Zeithaml (1992) constructed two scales in order to measure board involvement: involvement in the formation stage of the strategic decision-making process and involvement in the evaluation stage. Respondents were asked to rate statements listed below that best describes the board’s level of involvement.

Formation of New Strategic Decisions

1. The board is usually not involved with the formation of strategic decisions
2. The board usually ratifies strategic proposals that are formed solely by top management
3. The board usually asks probing questions and then ratifies strategic proposals that are formed primarily by top management
4. The board usually asks probing questions which lead to revisions of strategic proposals that are formed by top management
5. The board usually helps to form strategic decisions with top management in board meetings

6. The board usually helps to form strategic decisions with top management within and between board meetings
7. The board usually forms strategic decisions separate from top management

Evaluation of Prior Strategic Decisions

1. The board is usually not involved with monitoring the progress of strategic decisions
2. The board usually accepts the evaluation given to it by top management without asking probing questions
3. The board usually accepts the evaluation given to it by top management after asking probing questions
4. The board usually determines the timing and criteria of evaluation, but that information is supplied by top management and it is rarely challenged by the board
5. The board usually determines the timing and criteria of evaluation, but that information is supplied by top management and it is often challenged by the board
6. The board usually determines the timing and criteria of evaluation and it often requests additional information after receiving the progress report from top management
7. The board usually collects its own information about the progress of the strategic decision in addition to top management reports

Board involvement in the strategic decision -making process was operationalised by using the measurements of Judge and Zeithaml (1992) for formation of new strategic decisions and evaluation of prior strategic decisions. The above statements were modified and the respondents were asked to evaluate them using 7-point likert scale (“1” for never and “7” for always). In addition, two other parameters were incorporated; the *frequency of board meetings*: once a year, every six month, quarterly, every month, every fifteen days, every week as well as *the length of board meetings*: more than two hours, two hours, one and half hour, one hour, 30 minutes, less than 30 minutes.

3.7.5 Strategic Decision Process Dimensions

The strategic decision making process has been examined and interpreted by different perspectives: content research as well as process research. Different scholars have provided various measurements regarding the strategic-decision making process.

Papadakis, Lioukas and Chambers (1998) as Papadakis (1998) have been adopted by several researchers' seven strategic making process dimensions and they have measured them.

Rationality/Comprehensiveness

Fredrickson (1984) developed rationality/comprehensiveness dimension. There are five stages in the strategic decision process that are measured (i.e., the situation diagnosis, alternative generation, alternative evaluation, making of the final decision and decision integration). For each of these stages, Fredrickson (1984) used the following eight rationality elements for rationality of strategic decision-making which have been adopted for the purpose of the study (i.e. extent of scheduled meetings, assignment of primary responsibility, information-seeking activities, symmetric use of external sources, employees involved, use of specialised consultants, years of historical data view, and functional expertise of people involved).

Financial Reporting

The financial reporting activities consist of four 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, Lioukas and Chambers, 1998; March, Barwise, Thomas and Wensley, 1988). The measurement scale ranges from "1" strongly disagree to "7" strongly agree.

Rule Formalisation/Standardisation Process

The following items are used in order to measure the degree of formalisation/standardisation of the strategic-decision process: 1. the extent to which there exists a written procedure guiding the process, 2. existence of a formal procedure to identify alternative ways of action, 3. formal screening procedures, 4. formal documents guiding the final decision, 5. predetermined criteria for strategic decision evaluation

(Papadakis, Lioukas and Chambers, 1998). The measurement scale ranges from “1” strongly disagree to “7” strongly agree.

Hierarchical Decentralisation

The forthcoming measurements capture the extent of vertical decentralisation of the decision-making during all the phases of the process. Hierarchical levels include owner-main shareholder, CEO, first-level directors, middle management and lower management. Values are ranged between “1” no involvement at that stage to “5” active involvement and influence (Papadakis, Lioukas and Chambers, 1998; Tannenbaum, 1968; Grinyer, Al-Bazzaz and Yasai-Ardekani, 1986). However, in this study the above statement have been measured on a 7-point Likert scale.

Lateral Communication

Lateral communication is measured as the degree of balanced participation of all major departments in the five stages of the process: finance-accounting, production, marketing-sales, personnel and purchasing department (Papadakis, Lioukas and Chambers, 1998; Tannenbaum, 1968).

In this study, the following measurements have been adopted by various scholars (e.g. Papadakis, Lioukas and Chambers, 1998; Pettigrew, 1973; Mintzberg, Raisinghani and Theoret, 1976; Tannenbaum, 1968; Grinyer, Al-Bazzaz and Yasai-Ardekani, 1986; Miller, 1987):

- *Comprehensiveness/rationality*
- *financial reporting*
- *rule formalisation/standardisation process*
- *hierarchical decentralisation*
- *lateral communication.*

3.7.6 Innovation

Innovation is defined as the creation or adoption of new ideas, products or services (Daft, 1978). Damanpour and Schneider (2006) measured innovation by using the following three variables: initiation, adoption decision and implementation of ten administrative programmes associated with the new public management (NPM) movement of government reinvention (OECD, 1995; Osborne and Gaebler, 1992) that were adopted by local

governments between 1992 and 1997. Examples of programmes used in the survey are: training government employees for customer service and for decision-making, contracting out government services to outside vendors, partnering with private business, training neighbourhood organisations for decision-making and conducting surveys to measure citizens' expectation and satisfaction. The data was drawn from the International City/County Management Association (ICMA) about "reinventing government" in the United States. ICMA is a professional organisation that conducts frequent surveys on a variety of public sector topics and its sample consists of municipalities and counties meeting size selection criteria.

Initiation was measured by the organisation's proposal to request funding for each programme from the City Council ("0" for no request for funding, "1" for request for funding). Adoption decision is measured by the degree of support for programme funding ("0" for no funding, "1" for partial funding, "2" for full funding).

Implementation is operationalised by the degree of employment of the programme in the firm ("0" for not implemented, "1" for sometimes implemented, "2" always implemented).

Miller and Friesen (1983, pp. 32-33) measures innovation by using a 7-point likert-scale by asking the respondent to rate in the following five statements the degree to which these methods affect the innovation.

1. The rate, relative to competitors, of new product/service introduction by the firm ("1" for the rate has decreased very much to "7" for that has increased very much).
2. The rate of change in your methods of production or rendering of services ("1" for rate of change that has declined much to "7" for change that has accelerated rapidly).
3. Risk taking by key executives of the firm in seizing and exploring "chancy" growth opportunities ("1" has decreased very much to "7" has increased very much).
4. In dealing with its competitors, the firm ("1" for resorts much more to a live and let live philosophy to "7" has become more aggressive).
5. Seeking of unusual, novel solutions by senior executives to problems via the use of "idea men", "brainstorming" etc.) ("1" has become less common to "7" has become much more common).

Zahra (1996) used 5 items in order to capture innovation items covering the creation and introduction of products, emphasis on R&D investments and commitment to patenting.

Executives were asked to rate the firm's actual entrepreneurial activities using a five-point scale ("1" for strongly disagree to "5" strongly agree) according to the following statements:

Over the past three years, this company:

1. Has heavily spent (well above the industry average) on research and development (R&D)
2. Has maintained world-class research and development (R&D) facilities
3. Has introduced a large number of new products to the market
4. Has acquired significantly more patents than its major competitors
5. Has pioneered the development of breakthrough innovations in its industry

Bantel and Jackson (1989) divided innovation into two categories: technical and administrative and developed 55 items in order to measure it. They asked respondents to generate a list of innovations and to indicate their perceptions in terms of a) the percentage of bankers that have adopted the innovation, b) customer acceptance and c) financial investment required.

Huse (1994) develops 12 items in order to capture innovation. Using a 5-point Likert scale (beginning from "1" very low emphasis to "5" very high emphasis), respondents rated the firm's actual emphasis on each item. Corporate innovation is divided into three categories: product innovation (4 items), process innovation (5 items) and organisational innovation (3 items).

Product Innovation

1. Being the first company in the industry to make new products
2. Creating new products for fast market introductions
3. Creating new variations to existing product line
4. Increasing the revenue from new products less than 3 years old

Process Innovation

1. Being the first company in the industry to introduce new technology
2. Being the first company in the industry to introduce technological improvements
3. Creating innovative technologies
4. Investing heavily in cutting edge process technology-oriented R&D
5. Developing radically new technology

Organisational Innovation

1. Developing systems that encourage initiatives and creativity among employees
2. Encouraging innovation in the organisation
3. Supporting an organisation unit

For the purpose the research, 12 items divided in three different categories (product innovation, process innovation and organisational innovation) suggested by Huse were used to capture innovation but instead of 5-point likert scale, a 7-point Likert scale was used.

3.7.7 Organisational Characteristics

Organisational Size: According to Mintzberg (1979) and Child (1974), organisational size can be measured as by the total number of employees or by sales (Fich, 2005; Certo, Covin, Daily and Dalton, 2001) which was adopted for the purpose of the study.

Organisational Age was calculated as the number of years elapsed between the founding and the present year (Judge and Zeithaml, 1992; Tsui et. al., 2006).

Organisational Performance: The performance of the organisation is divided into two main categories: financial and operational performance. Financial performance, which is the dominant model in strategic research (Hofer, 1975) consists of the following measurements: sales growth, profitability (reflected by ratios such as return on investment, return on sale, and return on equity), earnings per share, market-to-book or stock-market returns (Venkatraman and Ramanujam, 1986). Operational performance includes non-financial measurements such as market-share, new product introduction, product quality, marketing effectiveness, manufacturing value-added and measures of technological efficiency (Venkatraman and Ramanujam, 1986). Different scholars use different measurements in order to capture organisational performance.

In this study, the measurements developed by Khandwalla (1976) and Tan and Litschert (1994) were used in order to capture the firm's relative performance compared to competitors: after-tax return on total assets, after-tax return on total sales, total sales

growth, overall performance and success and competitive positions. The response format was a 5-point Likert scale (bottom 20 percent to top 20 percent).

3.8 Methodology for Data Analysis

3.8.1 Introduction

“Substantive problems must thus be translated into the vocabulary of social inquiry... Working out a way of thinking through the choices and some appropriate sequence of tasks will allow you to answer a research question” (Alford, 1998, p. 25).

The selection of data analysis methods depends on whether the data will be qualitative or quantitative. Qualitative researchers focus on the knowledge of research setting; avoid distancing themselves from people or events of the study. The researcher is personally involved in the research and he or she is sensitive to prior assumptions (Neuman, 2006). However, quantitative researchers endeavour to achieve objectivity and integrity, therefore, they apply objective technology such as precise statements, standards techniques, numerical measurements, statistics and replication (Neuman, 2006). As Porter (1995, p. 74) has argued: *“Ideally, expertise should be mechanised and objectified....grounded in specific techniques.... This ideal of objectivity is a political as well as scientific one. Objectivity means rule of law, not of men. It implies the subordination of personal interests and prejudices to public standards”*.

As adopters of the positivist research, we attempt to apply quantitative research in our work.

3.8.2 Variables

Variables have been categorised into four main categories: *interval/ratio variables*: these are variables where the distances between the categories are identical across the range of categories; *ordinal variables*: these are variables whose categories can be rank ordered but the distances between the categories are not equal across the range; *nominal/categorical variables*: these comprise categories that cannot be rank ordered and finally, *dichotomous variables*: these contain data that have only two categories (Bryman and Bell, 2003, p. 241).

Multivariable indicator or multiple-item measures of concepts, like Likert scale produces strictly ordinal variables (Bryman and Bell, 2003, p. 240). After coding the variables, use SPSS (Statistical Package for the Social Sciences) version 13 in order to analyse them. A summary of the techniques used for data analysis in the study are presented below: descriptive statistics, correlation analysis, factor analysis, regression analysis and GLM (General Linear Model).

3.8.3 Classification of Statistical Techniques

For the analysis of our variables univariate and bivariate analysis will be employed. Univariate analysis occurs when one variable is analysed at a time and bivariate analysis occur when two variables at a time are analysed in order to test any interrelationship between variables. Univariate analysis includes frequency tables, diagrams, measures of tendency (i.e. arithmetic mean, median, mode). Popular univariate techniques include chi-square, t-test, z-test and GLM (General Linear Mode). The bivariate analysis includes contingency tables, Pearson's r , Spearman's ρ , Phi and Cramer's V (Bryman and Bell, 2003). In our case, univariate techniques such as descriptive analysis and GLM analysis and the bivariate technique of correlation analysis are employed for the purpose of the undergoing study.

Multivariate analysis is a statistical method that deals with one or more variables. It can be examined either by defining dependent or independent variables or treating them equally (Bryman and Cramer, 2001).

3.8.4 Descriptive Statistics

Descriptive analysis is a univariate analysis which consists of frequency tables, diagrams, measures of central tendency (arithmetic mean, median, and mode) and measures of dispersion (Bryman and Bell, 2003).

3.8.5 Correlation Analysis

It examines the relationships between variables describing the direction and degree of association between them. A correlation matrix includes the values of the correlation coefficients for the variables involved. (Robson, 2002). A correlation is very low if the

coefficient has a value under 0.20, low between 0.21 and 0.40, moderate between 0.41 and 0.70, high between 0.71 and 0.91 and very high if it is over 0.91 (Pfeifer, 2000). Pearson product-moment correlation coefficient was used in order to examine the strength of a correlation and whether is appropriate to proceed toward subsequent analysis.

3.8.6 Factor Analysis

Factor analysis is one of several multivariate techniques. Factor analysis is used in order to discern the underlying dimensions or regularity in phenomena. In effect, it summarises the information contained in a large number of variables into a smaller number of factors (Rummel, 1967). Factor analysis was used to inform the reduction of items to a more manageable number (Gerbing and Anderson, 1988). This technique attempts to determine the number and nature of the underlying factors affecting the relationship between a set of variables (Schwartz, 1971). A factor matrix is a table of coefficients that expresses the relationships between the variables and the underlying factors. The elements in the factor matrix are referred to as "factor loadings". Factor analysis is a statistical technique used for a large number of variables to establish interrelationships between variables. It is often used with multiple-indicator measures to see if the indicator tends to cluster one or more groups of indicators. This group of indicators are called factors (Bryman and Bell, 2003). Principal component analysis with varimax rotation was used in order to reduce the number of variables (Hair et al., 1998).

3.8.7 Regression Analysis

Regression is used to examine the relationship between variables especially the extent to which a dependent variable is a function of one or more independent variables. It is used to analyse the relationship between a single dependent variable and several independent variables (Hair et al., 1998). The values of one are used to predict the values of others (Robson, 2002). Multiple regression analysis was used to examine the proposed research hypotheses. In this study we used multiple regressions since we attempted to predict an outcome from various predictors (Field, 2005). Usually, the investigator seeks to ascertain the causal effect of one variable upon another. The regression line is described algebraically by the regression equation that expresses the relationship between two variables. In fact the straight line is defined by (1) the slope or gradient (usually denoted by b_1) and (2) the point at which the line crosses the vertical axis of the graph (known as the intercept of the line b_0). The general model can be expressed in the equation below: $Y_i =$

$(b_0 + b_1 X_i) + \epsilon_i$, where Y_i is the outcome, X_i the participants' score on the predictor variable, b_1 is the gradient of the straight line fitted to the data and b_0 the intercept of that line, b_0 and b_1 are regression coefficients and finally, ϵ_i represents the difference between the scores.

T-statistic was used which is drawn from a t distribution if the null hypothesis is true. This statistic can be positive or negative as the parameter estimate from which it is derived is greater or less than the hypothesised true value of the parameter.

The researcher conducted fundamental tests of the underlying assumptions for multiple regression analysis in order to ensure that the data were conducive to such analyses. For example, the relationships between the independent variables as well as the relationships between the dependent and independent variables were analysed using correlation coefficients for every potential pair of variables used in the study. Multicollinearity tests were developed using variance inflation factors (VIF) to test for the presence of multicollinearity between each of the independent variables. The results of the tests for multicollinearity depended upon the values of the VIFs for all independent variables.

3.8.8 General Linear Model

General Linear Model (GLM) is a statistical analysis method. The General Linear Model (GLM) underlies most of the statistical analyses that are used in applied and social research. It is the foundation for the t-test, analysis of variance (ANOVA), Analysis of covariance (ANCOVA), regression analysis, and many of the multivariate methods including factor analysis, cluster analysis, multidimensional scaling, discriminant function analysis, canonical correlation. The general linear model can be expressed in the following equation: $y = b_0 + bx + e$, where: y = a set of outcome variables, x = a set of pre-program variables or covariates, b_0 = the set of intercepts (value of each y when each $x=0$), b = a set of coefficients, one each for each x .

GLM provides an advantage by allowing analysis of variance through splitting the data into levels and running the analysis using categorical data that define the levels. For the purpose of our study, we have used GLM as a univariate analysis method. GLM uses a model-specified data analysis. However, the major problem in using GLM is model specification as the exact equation that best summarises the data for the study has to be specified (Trochim, 2001). Apart from regression analysis, GLM was used in order to test

the hypothesised relationships. GLM was applied as a statistical tool because the independent variables of in the study consist of both continuous and categorical data. Also, the moderating effect of categorical data needed to be analysed. Moderation effect, by definition, implies a categorical variable because it involves a comparison of high and low values. In the current study, environment is proposed to be a moderator so using GLM the combined effect of high and low levels of certain strategies can be measured.

For the hypothesis testing, two statistical techniques have been employed: multiple regression analysis and GLM analysis. The use of several statistical approaches might be explained by the fact that most of the studies in strategic management have used regression analysis to test the hypothesised relationships (i.e. Papadakis, Lioukas and Chambers, 1998; Elbanna and Child, 2007; Goll and Rasheed, 2005). Linear regression models often enter variables in a purely additive way, and thereby the resulting estimates concern effects of a single variable in isolation. The estimated effect does then not say anything about how the effect from the variable interacts with other factors, and is therefore context-independent. GLM analysis was also employed since we have a mix of continuous and categorical independent variables. Employing two statistical analyses, the researcher attempted to have a holistic understanding of the nature of causal relationships.

In addition, the researcher attempted to achieve a robust methodological approach using two statistical techniques. Also, the results from the two analyses would provide a clear understanding of the factors that influence strategic decisions in Greek organisations.

Regarding the appropriateness of ordinal-scaled data in parametric tests, Stevens (1951, p. 26), the inventor of the four levels of measurement stated *"As a matter of fact, most of the scales used widely and effectively by psychologists are ordinal scales ... there can be involved a kind of pragmatic sanction: in numerous instances it leads to fruitful results."* Based on the central limit theorem and Monte Carlo simulations, Baker, Hardyck, and Petrinovich (1966) and Borgatta and Bohrnstedt (1980) argued that for typical data, worrying about whether scales are ordinal or interval does not matter. Debate of statistics in terms of scale types (Luce et al., 1990) assert that the scale type of data is determined by the nature of the measurement and it constrains the hypotheses suggested and then tested. Modern approaches to data analysis such as Exploratory Data Analysis (e.g. Tukey, 1977; Velleman and Hoaglin, 1981 and Hoaglin et al., 1983) stated that hypotheses often do not precede the data. Some social scientists (e.g. Blaikie, 2003; Santana and Perez, 2003 and Hren, 2004) believe that the ordinal-scaled data based upon a Likert-scale could be

converted into a form of -interval-scaled data. To be specific, when 50 five-point Likert-scaled items are totaled as a composite score, the possible range of data value would be from 1 to 250. In this case, a more extensive scale could form a wider distribution. Nonetheless, this argument is not universally accepted. In our case, we have transformed the scale ordinal data into continuous by using principal component analysis and we have concluded with certain number of factors that describe each construct of our study.

3.9 Concluding Remarks

In this chapter, the research approach followed in the study was described and explained. The use of quantitative techniques: e-mail attached questionnaires, and secondary data and analysing the data using positivism theory which will enable the data to be conceptualised. The survey methodology and the proposed data collection methods have been analysed in the lights of their limitations. Being aware of the limitations and how they can affect the undertaken study, is likely to increase the validity and reliability of the research. The following chapter will present the descriptive findings of the study.

CHAPTER 4

Descriptive Research Findings

4.1 Introduction

This chapter provides an account of the descriptive findings generated from the empirical analysis detailed in Chapter Four. Descriptive statistics such as averages and measures of central tendency and dispersion are used in order to understand the structure of the data and to identify potential problems with the misconception of data (Peacock, 1998). However, Bailey (1982, p. 39) stated that: *“In a descriptive study...the researcher may be more concerned with describing the extent of occurrence of a phenomenon than with studying its correlates. In such a case univariate presentation is in order”*.

Descriptive research findings are detailed and discussed on a construct by construct basis. The descriptive results will be presented in the following order: company's background; board composition; board demographic characteristics; external corporate environment; involvement in the strategic decision-making process; characteristics of the strategic decision-making process; strategic choice of innovation and organisational performance.

4.2 Measures of Company's Background: Descriptive Findings

The empirical findings presented in Table 4:1a illustrate the organisational characteristics of 105 Greek listed organisations in ASE. The listed companies of the study employed on average 1481 employees range from 1 to 26208 with a mode of 790.

The Greek organisations quoted on ASE are relatively young with an average age of 34 with mode of 8 and with the oldest company being 128 while the youngest being 6 years old. The companies of the sample have registered on average 13 years in the ASE however; the majority (30%) of Greek firms was quoted in the last twenty years and only 10% of them in the last 60 years. The fact that Greek organisations have recently entered the Athens Stock Exchange indicates that they do not have an institutional corporate governance mechanism.

The respondent companies are engaged in the following economic sectors according to the classification of Athens Stock Exchange. The vast majority (17.1%) of 104 Greek firms were retailing followed by 12.4% industrial goods and services and 11.4 % financial services. Findings from previous studies presented in Table 5:1b have a lot of similarities

with the Greek firms with respect to organisational characteristics such as organisational size, age and the economic sectors in which they are engaged.

Table 4:1a Measures of Company's Background							
Company's Background							
	Minimum	Maximum	Mean	Median	Mode	SD	n
Number of Employees	1	26208	1481.98	600.0000	790.00	3296.93	103
Organisational Age	6	128	33.78	26.500	24.00	24.95	104
Number of Years Listed	1	95	13.36	9.0000	8.00	15.18	96
Economic Sector							
Oil and Gas							1.9%
Chemicals							1%
Basic Resources							3.8%
Construction and Material							9.6%
Industrial Goods & Services							12.5%
Food and Beverages							6.7%
Personal and Household Goods							4.8%
Insurance							1.9%
Technology							3.8%
Health Care							4.8%
Retail							17.3%
Media							1.9%
Travel and Leisure							2.9%
Telecommunications							3.8%
Utilities							1.9%
Banks							7.7%
Financial Services							11.5%
Port Services							1%
Fish Farming							1%

Table 4: 1b Company's Background of Relevant Studies			
Organisational Size	Study	Sample Size	Mean (no of employees)
	Daily and Dollinger, 1992	486 Small Manufacturing Firms	78.89
	Rose, 2005	446 listed Danish Firms	3273
Organisational Age	Study	Sample Size	Mean (no of years)
	Mak and Li, 2001	147 listed Singapore firms	12.83
	Daily and Dollinger, 1992	486 Small Manufacturing Firms	41.72
	Boeker and Goodstein, 1993	67 firms consist of 43 publicly traded and 24 privately traded	10.42
	Bonn, Yoshikawa and Phan, 2004	104 Australian manufacturing firms	43.44
	Bonn, Yoshikawa and Phan, 2004	169 Japanese manufacturing firms	63.73
	Filatotchev and Bishop, 2002	251 IPO quoted firms in LSE	5
	Qian, Li, Li and Qian, 2008	U.S firms on Fortune 500	24
Economic Sectors of Listed Firms	Study	Sample Size	Economic Sectors
	Wan and Ong, 2005	212 listed Singapore companies	40% manufacturing
	Aloneftis, 1999	48 Cyprus listed firms	48% financial ,18.55% manufacturing and construction, 10.5% tourism, 4.5% transportation and distribution, 2% retail and 7% other industrial categories
	El Mehdi, 2007	Tunisian firms	48.2% wholesale and retail, 23.5% services, 19.2% manufacturing, 18.8%banking, 6%finance and insurance
	Bennett and Robson, 2004	U.K SMEs	58%manufacturing, 42%business

4.3 Measures of Board Composition: Descriptive Findings

The empirical results presented in Table 4:2a demonstrated Greek board composition characteristics. The average number of directors in Greek boards is 8; the majority of Greek companies consist of either 7 (24%) or 5 (20%) directors respectively.

The average board size of Greek listed firms is similar to those boards operating in other countries mainly in Europe, in Australia and in New Zealand as it can be seen from Table 4:2b. Regarding the board composition, the majority of Greek boardrooms consist of inside directors (mean: 3.76) rather than outside (mean: 2.57). On the contrary, the composition of other boards in Europe, in the United States and in Asia is characterised by a large proportion of outside directors (Table 4:2 b).

Furthermore, Greek listed organisations seem to have a balance between executive and non-executive directors. The average number of executive directors in listed Greek organisation was 3.24 with a minimum of one and a maximum of eight board members. The majority of Greek organisations (28.6%) have three executive directors while the average board size is 8. However, the average number of non-executive directors was 3.77 range from one to eleven non-executive board members. The majority of Greek corporations (16.2%) have three non-executive directors. Companies operating in different cultural contexts tend to employ a larger proportion of non-executive directors as they have to comply with international corporate governance codes (Table 4:2b). It is worthy of mention that Greek listed firms have few independent and non-executive board members (mean: 2.36) in an average board size of eight. This is explained by the fact that most of Greek organisations are family businesses and sometimes the appointment of a board member is through personal ties or business contacts with the owner/shareholder of the firm (Papalexandri, 1992).

Concerning the interlocking directorates, the majority of Greek listed firms (16.2%) have on average two board members that serve in another board as Table 4:2a indicates. Firms operating in other international contexts have more interlocking directors and consequently, greater access to information.

The board leadership structure in Greece is characterised by independent leadership structure. The majority of publicly traded firms (57.4%) have a separate leadership structure, while 42.6% have adopted the joint leadership approach where the positions of Chairman and CEO are fulfilled by different individuals. Similar to Greek boards, European boardrooms adopt the separate leadership structure compared to American boards which choose the CEO duality.

Finally, the female representation in Greek boardrooms is very low (mean: 0.68). Boards of Directors as well as many managerial positions in Greece are considered to be male dominant.

These findings confirm many preoccupations related to the hierarchical position of men and women in the society as well as the dominance in the business field. It is worth mentioning that recent regulations encourage the female representation on Greek boards. The female representation in other boards in Continental Europe, in U.S and in Australia is considerably higher and ranges from 10 to 50% (Table 4:2b).

Table 4:2a Measures of Board Composition							
Board Composition							
	Minimum	Maximum	Mean	Median	Mode	SD	n
Total Number of Board Membe	3	17	8.09	7.0000	7.00	2.84	103
Inside/Internal Board Members	1	9	3.76	3.0000	3.00	1.99	96
Outside/External Board Membe	0	9	2.57	2.0000	2.00	1.31	100
Interlocking Board Members	0	15	3.57	3.0000	2.00	3.11	83
Executive Board Members	1	8	3.24	3.0000	3.00	1.64	93
Non-Executive Board Members	1	11	3.77	3.0000	3.00	2.49	75
Independent and Non-Executive Board Members	1	7	2.36	2.0000	2.00	.94	87
Female Board Members	0	4	.68	1.000	0	.78	102
CEO Duality ^a	1 43 (42.6%)	2 58 (57.4%)	1.57	2.000	2.00	.49692	101

^a Scale: (1) The position of Chief Executive Officer and Chairman are hold by the same individual, (2) The position of CEO and Chairman are hold be different individuals

Table 4:2b Measures of Board Composition in Other Studies

Board Composition			
Board Size	Study	Sample	Mean (no of board members)
	EUROPE		
	O'Sullivan and Diacon, 1999	43 UK mutual insurance firms	10
	O'Sullivan and Diacon, 1999	86 property firms	7.5
	Rose, 2005	446 Danish listed firms	5.2
	Ruigrok, Peck and Tacheva, 2007	210 Swiss publicly listed firms	7.99
	De Andres, Azofra and Lopez, 2005	450 non-financial firms from West European Countries and North America	15 (German firms) 9(Swiss and Italian firms) 12-13 (American, British, Spanish, French and Belgian firms)
	UNITED STATES		
	Yermack, 1996	452 industrial corporations	12.25
	Carpenter and Fredrickson, 2001	300 U.S firms	6.03
	Baker and Gompers, 2003	1116 IPO firms	6.07
	Goodstein,Gautam and Boeker, 1994	334 US hospitals	10.26
	Johnson, Hoskisson and Hitt, 1993	92 U.S restructuring firms	11.28
	Byrd and Hickman, 1992	111 US firms making 128 acquisitions	12.1
	Rosenstein and Wyatt, 1990	1251	12.2
	Ocasio, 1994	120 industrial corporations	10
	Judge and Zeithaml, 1992	6800 general hospitals	12.9
	ASIA		
	Wan and Ong, 2005	212 Singapore firms	7.4
	Abdullah, 2004	Malaysian firms	7.66
	Bonn, Yoshikawa and Phan, 2004	169 Japanese manufacturing firms	27.62
	Kim, 2007	199 publicly traded Korean firms	10.51
	AUSTRALIA		
	Kang, Cheng and Gray, 2007	100 Australian firms	8.19
	NEW ZEALAND		
	Cahan, Chua and Nyamoki, 2005	112 public sector firms	5.85

Table 4:2b Measures of Board Composition in Other Studies(cont.)

Board Composition			
Inside versus Outside Board Members	Study	Sample	% of Inside vs. Outside Board Members
	Roosenboom (2005)	IPOs firms	46.9% inside directors (current managers), 18.9% affiliated directors (outsider directors that are former managers of the company or the TMT of the firm) and 34.2% independent directors (outside directors without affiliation)
	Schellenger, Wood and Tashakori, 1989	750 firms listed on Compustat Industrial tape and centre of research in Security prices	64.7% outsiders
	Ooghe and De Langhe, 2002	Belgian firms	60% outsiders
	Hanson and Song, 2000	U.S firms	33.3% insiders, 66% outsiders including gray directors
	Denis and Sarin, 1999	U.S firms	40% insiders, 20% affiliated outsiders and 39% independent outsiders
	Fich, 2005	US firms listed in NYSE	62.9% outsiders
	Bonn, Yoshikawa and Phan, 2004	Japanese and Australian firms	outsiders
	Chaganti, Mahjan and Sharma, 1985	US failed and non-failed firms	51% outsiders for failed firms 49% of outsiders for non-failed firms
	Mak and Li, 2001	Singapore firms	outsiders
	Cahan, Chua and Nyamoeri, 2005	New Zealand firms	13% insiders, 17% grey directors and 70% independent outsiders
	De Andres, Azofra and Lopez, 2005	Belgium, Canada, Switzerland, Germany, Spain, France, U.K, Italy, Netherlands, U.S.A	83% outsiders, 17% insiders

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Executive Board Members	Study	Sample	% of Executive Board Members
	O'Regan, O'Donnell, Kennedy Bontis and Cleary, 2005	Irish firms	95% executives
	Vafeas and Theodorou, 1998	U.K firms	39% non-executives
	Brennan and McDermott, 2004	Irish firms	39% executives, 61% non-executives

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Non-Executive Board Members	Study	Sample	% of Non-Executive Members
	De Andres, Azofra and Lopez, 2005	Belgium, Canada, Switzerland, Germany, Spain, France, U.K, Italy, Netherlands, U.S.A	70% non-executives
	Weir and Laing, 2001	U.K firms	83% three or more non-executive directors
	Vafeas and Theodorou, 1998	U.K firms	33% non-executives
	O'Sullivan, 2000	175 largest quoted firms	41.17% non-executives
	Bhagat and Black, 1999	U.S firms	76% non-executives
	Kiel and Nicholson, 2003	Australian firms	69% non-executives
	Wan and Ong, 2005	Singapore firms	Non-executives
	Yermack (1996)	Large U.S firms	Non-executives

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Independent and Non-Executive Board Members	Study	Sample	% of independent executives
	Bhagat and Black, 1999	U.S firms	80% independent executives
	Weir and Laing, 2001	320 quoted UK firms	24% independent executives
	Bhagat and Black, 2002	U.S firms	70% independent executives
	Anderson and Reeb, 2004	Non-Family firms	61.2 % independent executives
	Clifford and Evans, 1997	Australian firms	35.2% independent executives
	Chen and Jaggi, 2000	Hong Kong	28.2% independent executives
	Ruigrok, Peck and Tacheva, 2007	Swiss firms	4.38% independent executives

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Interlocking Board Members	Study	Sample	% of Interlocking Executives
	Boyd, 1990	U.S firms	22 interlocking directors
	Kiel and Nicholson, 2003	Australian quoted firms	20% of firms have more than 10 interlocks
	Phan, Lee and Lau, 2003	Singapore sample	6.62% interlocking executives
	Fich, 2005	U.S quoted firms on NYSE	6.3% interlocking executives
	Rose, 2005	Danish firms	5.2% interlocking executives
	Zajac, 1988	Chemical firms in U.S	50 random groups of 53 firms have on average 16 interlocking executive

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Leadership Structure	Study	Sample	Joint or Separate leadership structure
	EUROPE		
	Weir and Laing, 2001	U.K firms	17% joint leadership structure
	Canyon and Mallin, 1997	U.K firms	14% joint leadership structure
	Dahya and Travlos, 2000	U.K firms	Separate leadership structure
	Brown, 1997	480 U.K firms	Separate leadership structure
	ASIA		
	Wan and Ong, 2005	Singapore firms	30% joint leadership structure
	Mak and Li, 2001	Singapore firms	48% joint leadership structure
	Huafang and Jianguo, 2007	Chinese firms	11% joint leadership structure
	Abdullah, 2004	Malaysian firms	Separate leadership structure
	UNITED STATES		
	Sundaramurthy, Mahoney and Mahoney, 1997	U.S firms	18.4 % separate leadership structure
	Aguilera, 2005	U.S firms	Joint leadership structure
	Dahya and Travlos, 2000	U.S firms	Joint leadership structure
	Daily and Dalton, 1997	U.S firms on Business Week	20% Separate leadership structure

Table 4:2b Measures of Board Composition in Other Studies(cont.)			
Board Composition			
Female Representation	Study	Sample	% of females directors
	Rose, 2007	Danish firms	22% females executives
	Catalyst, 2003	U.S firms	13.6% females executives
	Peterson and Philpot, 2007	U.S firms on Fortune 500	13.2% females executives
	Pajo, McCregor and Cleland, 1997	New Zealand firms	28% females executives
	Kang, Cheng and Gray, 2007	Australian firms	51% females executives
	Tacheva and Huse, 2006	Norwegian firms	13.2% females executives
	Ruigrok, Peck and Tacheva, 2007	Swiss firms	3% females executives

4.4 Measures of Demographic Characteristics of the Board: Descriptive Findings

The Table 4:3a presents the demographic characteristics of Greek directors. The average age of board members of quoted firms on ASE was 45.94. The youngest director was 26 years old while the oldest was 72. The mode identified in the age of board members is 33 with a standard deviation of 11.81. European and American executives seem to be quite a lot older compared to their Greek counterparts (Table 4:3b).

The majority of the executive respondents of this research questionnaire were male directors (86%) which is compatible with the low ratio of women in Greek boardrooms.

Greek board members of listed organisations have a relatively high level of formal education with 46% of Master's holders, followed by 35% of Bachelor's degree, by 15% PhD and only 4% of High School diploma. Greek executives receive higher education compared to European and American counterparts (Table 4:3b). Greek directors have an educational specialty mainly in Business (34%), followed by Business Administration (28%), Social Sciences-Economics-Sociology (16%), Engineering (9%), Marketing (4%), Sciences (2%) and other (2%).

Their functional background is mainly in general management (54.5%), in accounting (30.3%), in finance treasurer (4%), in marketing (3%), in banking (3%), in human resources (2%), in public affairs (1%), in maintenance (1%) and in operations (1%). However, other international counterparts have "*throughput*" functional experience in production/operations, finance and accounting/data processing/information systems and process (Table 4:3b).

Regarding the executives' tenure, their industry tenure varies from 1 to 44 (mean: 14.41), company tenure varies from 1 to 37 (mean: 10.63) and position tenure varies from 1 to 32 (mean: 7.88). In addition, Greek executives have relatively little international experience (mean: 1.4 years abroad). The results below reveal that board members of Greek organisations are committed to both organisation and position and seem to be quite reluctant for either rotation or career change. However, other board members in international cultural contexts have limited tenure within their company or the position they serve.

	Minimum	Maximum	Mean	Median	Mode	SD	n
Age of Board Members	26	72	45.94	46.0000	33.00	11.81	99
Industry Tenure of Board Members	1	44	14.41	11.5000	3.00	10.68	96
Company Tenure of Board Members	1	37	10.63	7.0000	4.00	9.26	97
Position Tenure of Board Members	1	32	7.88	5.0000	2.00	7.69	97
International Experience of Board Members	0	17	1.4	.0000	.00	3.37	80

Board Demographic Characteristics	Response Scale							Descriptive Scale		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	n
Gender of Board Members ^a	86%	14%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100
Highest Educational Degree of Board Members ^b	4%	35%	46%	15%	N/A	N/A	N/A	N/A	N/A	100
Highest Educational Specialty of Board Members ^c	9%	2%	28%	34%	16%	4%	2%	N/A	N/A	100
Functional Background of Board Members ^d	4%	2%	1%	54.5%	1%	3%	1%	30.3%	3%	99

^a Scale : (1) Male, (2) Female

^b Scale: (1) High-School Graduate, (2) Bachelor's Degree, (3) Postgraduate Degree (Master's), (4) PhD (Doctorate)

^c Scale: (1)Engineering, (2) Sciences(Physics, Chemistry, etc), (3) Business Administration, (4) Business (Accounting, Finance,HRM,etc), (5) Social Sciences-Economics-Sociology, (6) Marketing, (7) Civil Engineering, (8) Other

^d Scale: (1)Finance Treasurer, (2) Human Resource Management, (3)Public Affairs, (4)General Management,(5)Maintenance/FieldService, (6) Marketing/Sales/Customer, (7)Operations/Field Service, (8) Accounting/Controller, (9) Banker

Age of Board Members	Study	Sample	Mean (director's age)
	Bonn, Yoshikawa and Phan, 2004	Australian firms	56.71
	Kang, Cheng and Gray, 2007	Australian firms	60.5
	Bonn, Yoshikawa and Phan, 2004	Japanese firms	59.25
	Dedman, 2000	U.K firms	54.64
	Mcknight and Tomkins, 2004	U.K firms	53.5
	Rose, 2005	Danish firms	57
	Egri and Herman, 2000	Swiss firms	56.5
	Egri and Herman, 2000	Korean firms	51.62
	Egri and Herman, 2000	U.S and Canadian firms	45
	Guthrie and Datta, 1997	U.S firms	51.24
	Wiersema and Bantel, 1992	U.S Manufacturing firms	55.5
	Barker and Mueller, 2002	R%D U.S firms	57.42
	Young and Buchholtz, 2002	U.S industrial firms	58.6

Gender of Respondents	Study	Sample	Percentage of respondents
	Egri and Herman, 2000	Swiss, Korean, U.S and Canadian firms	86.6% males, 13.2 females

Highest Educational Degree of Board Members	Study	Sample	Highest Educational Specialty(%)
	Egri and Herman, 2000	U.S and Canadian profit and non-profit firms	31% bachelor's degree, 34%master's degree, 7% doctoral degree
	Wiersema and Bantel, 1992	Largest U.S Manufacturing firms on Fortune 500	2%high school graduate, 10%college graduate, 55%baccalaureate degree, 22%master's degree, 9%doctoral degree
	Datta and Rajagopalan, 1998	U.S Manufacturing firms	graduate degree
	Rajagopalan and Datta, 1996	U.S Manufacturing firms	graduate degree
	Barsade, Ward, Turner and Sonnenfeld, 2000	U.S firms	graduate degree

Highest Educational Specialty of Board Members	Study	Sample	Educational Specialty (%)
	Rose, 2006	Danish firms	28% economics, 22%engineering, 11% law
	Egri and Herman, 2000	U.S and Canadian profit firms	30%sciences, 27%arts, 17%business administration, 17%engineering, 10%environmental sciences
	Egri and Herman, 2000	U.S and Canadian non-profit firms	46%arts, 36%sciences, 11%law and 7% environmental sciences

Functional Background of Board Members	Study	Sample	Functional Background (%)
	Barsade, Ward, Turner and Sonnenfeld, 2000	U.S firms	37%management, 17%marketing, 11%finance, 11%entrepreneurship, 9%operations, 6%law and 9%other specialties
	Guthrie and Datta, 1997	U.S firms	63%throughput functional background (production/operations, finance/accounting/data processing/information systems and process)
	Datta and Rajagopalan, 1998	U.S firms	72%throughput functional background(production/operations, finance/accounting/data processing/information systems and process)

Company Tenure	Study	Sample	Mean (no of years)
	Guthrie and Datta, 1997	U.S firms	18.15
	Egri and Herman, 2000	Canadian firms	9.9
	Egri and Herman, 2000	U.S firms	9.2
	Entrialgo, 2002	Spanish firms	14.19
	Wiersema and Bantel, 1992	U.S Manufacturing firms on Fortune 500	21.5
	Hambrick, Cho and Chen, 1996	32 U.S airline firms	14.32

Position Tenure of Board Members	Study	Sample	Mean (no of years)
	Dedman, 2000	U.K firms	10.34
	Mcknight and Tomkins, 2004	U.K firms	6.1
	Bathala and Rao, 1995	U.S firms	10.5
	Kosnik, 1990	U.S firms	9.17
	Entrialgo, 2002	Spanish firms	10.21
	Egri and Herman, 2000	Profit and non-profit Canadian firms	7.5
	Egri and Herman, 2000	Profit and non-profit U.S firms	7.8
	Schnake, Fredenberger and Williams, 2005	U.S financial services firms	8.57
	Barker and Mueller, 2002	U.S R&D firms	8.29
	Pfeffer and Moore, 1980	Heads of Academic department in U.S	2.87
	Singh and Harianto, 1989a	89 Largest U.S firms	19.66
	Finkelstein and Hambrick, 1990	100 U.S firms	22
	Young and Buchholtz, 2002	U.S large industrial corporations	7.76

International Experience of Board Members	Study	Sample	Mean (no of years)
	Magnusson and Boggs, 2006	200 largest U.S firms	Few years
	Herrmann and Datta, 2006	U.S Manufacturing firms	3.80
	Carpenter, Sanders and Gregersen, 2001	U.S firms	16

4.5 Measures of External Corporate Environment: Descriptive Findings

The descriptive statistics of the environmental dimensions can be found in Tables 4:4. Respondents were asked to consider to what extent they believe that their company operates under the following three environmental circumstances: environmental complexity, or otherwise homogeneity-heterogeneity, environmental dynamism and finally, environmental munificence/hostility.

Their responses were constructed on a seven-point agreement scale and certain notable findings were evident. Only one of the environmental munificent item exhibited mean score below the mid-point of 4. The variable that was recognisably low was the little threat to the survival and well-being of the company (mean=3.93). The fact that the respondents scored low is explained by the fact that most of board members of Greek firms actually do not have a “small” fear regarding the well being and the survival of the firms but actually they have an increased concern regarding the prosperity of their firm. The remaining 17 items have exhibited scores above the mid point of 4. This indicates that the respondents agree to some extent that their organisations operate within the environmental circumstances namely: complexity, dynamism and munificence or hostility. Dess and Beard (1984) condensed Aldrich’s (1979) codification of environmental dimensions and identified these environmental dimensions. These three environmental circumstances are similar to those proposed by other scholars (e.g. Pfeffer and Salancik, 1978; Mintzberg, 1979; Scott, 1981).

Table 4: 4 Measures of External Environment										
External Corporate Environment	Response Scale							Scale Descriptive		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean	SD	n
Environmental Complexity										
Predictability in the market activities of your key competitors in your sector	N/A	9.1%	2.0%	14.1%	21.2%	45.5%	8.1%	5.16	1.34	99
Predictability in the tastes and preferences of your customers in your principal industry during the recent years	2.1%	2.1%	2.1%	12.5%	18.8%	53.1%	9.4%	5.40	1.21	96
Increase in the innovation rate of new operating processes and new products or services in your principal industry	N/A	4.1%	6.2%	15.5%	20.6%	36.1%	17.5%	5.30	1.32	97
Hostility in the market activities of your key competitors	2.1%	11.3%	2.1%	25.8%	16%	25.8%	13.4%	4.80	1.57	97
Influence of the market activities from your key competitors	1.0%	5.2%	2.1%	16.5%	28.9%	35.1%	11.3%	5.17	1.29	97
Increase in the needed diversity in your production methods and marketing tactics to cater your different customers	3.2%	5.3%	2.1%	17.0%	21.3%	34.0%	17.0%	5.18	1.50	94
Environmental Dynamism										
Changes in the mix of products/brands carried	4.3%	9.7%	6.5%	14.0%	25.8%	30.1%	9.7%	4.76	1.61	93
Changes in the sales strategies	5.3%	1.1%	5.3%	17.9%	18.9%	35.8%	15.8%	5.14	1.52	95
Changes in the sales promotion/advertising strategies	3.2%	4.2%	2.1%	18.9%	28.4%	30.5%	12.6%	5.07	1.40	95
Changes in the competitor's mix of products/brands	4.3%	6.4%	8.5%	26.6%	28.7%	21.3%	4.3%	4.50	1.41	94
Changes in the competitor's sales strategies	4.2%	5.3%	8.4%	28.4%	30.5%	16.8%	6.3%	4.51	1.40	95
Changes in the competitor's sales promotions/advertising strategies	3.2%	7.4%	7.4%	28.7%	28.7%	21.3%	3.2%	4.48	1.36	94
Changes in the customer preferences of the product features	N/A	7.8%	6.7%	27.8%	16.7%	28.9%	12.2%	4.88	1.42	90
Changes in the customer preferences of the brands	N/A	12.8%	7.0%	27.9%	16.3%	31.4%	4.7%	4.60	1.44	86
Changes in the customer preferences of the product quality/price	1.1%	9.7%	3.2%	18.3%	24.7%	32.3%	10.8%	4.95	1.45	93
Environmental Munificence/Hostility										
Little threat to the survival and well-being of the company	18.3%	14.0%	5.4%	21.5%	9.7%	21.5%	9.7%	3.93	2.03	93
Rich in investment and marketing opportunities	2.1%	8.5%	5.3%	20.2%	21.3%	31.9%	10.6%	4.88	1.50	94
An environment that the company can control and manipulate to its own advantage, such as a dominant firm has in an industry with little competition and few hindrances	5.2%	15.5%	10.3%	23.7%	19.6%	18.6%	7.2%	4.21	1.65	97

Scale: (1) "Strongly Disagree", (2) "Disagree", (3) "Slightly Disagree", (4) Neither Agree or Disagree, (5) Slightly Agree, (6) Agree, (7) Strongly Agree

4.6 Measures of Board Involvement in the Strategic Decision - Making Process: Descriptive Findings

The Table 4:5a illustrates the distribution of responses scored for the measures of board involvement in strategic decision-making process. Respondents were asked to indicate the extent to which Boards of Directors participate in the formation and evaluation of strategic decisions. Their responses were constructed by a seven-point Likert scale ranging from “*strongly disagree*” to “*strongly agree*” and certain notable findings were evident.

Upon inspection of the calculated mean results, it was notable to observe that four indicators of board involvement in formation as well as evaluation of the strategic decision-making process were particularly low in their scoring. Two of these specific variables referred to the involvement of the board regarding the formulation of strategic decisions: the board is not usually involved with the formation of strategic decisions (mean=2.40); the board usually forms the strategic decisions separately from the TMT (mean=3.11) and the remaining two referred to the evaluation of strategic decisions: the board is not usually involved with the monitoring of the progress of strategic decisions (mean=2.69), the board usually accepts the evaluation of strategic decisions by the TMT without asking probing questions (mean=2.78). Two of the variables have low scoring because the variables contain a negative meaning and the majority of the board members indicate that they strongly disagree with the fact that the board is not actively involved with the formation of decisions as well as with the monitoring of the progress of strategic decisions. Indeed, the board members argue that they play a dominant role in the formation of strategic decisions and they monitor effectively the progress of their decisions. Regarding the remaining two low scoring variables, directors state that they cooperate with the top management team of their firms prior to any decisions and they accept their decisions after careful investigation. A host of other variables tended to exhibit results that were widely distributed throughout the seven-point scale which consequently, characterised mean scores above the mid-point of 4.

Table 4:5b depicts the distribution of responses for board’s involvement in the strategic decision-making process with respect to the frequency and duration of their board meetings. The vast majority of board members in Greek listed organisations in ASE have a scheduled formal meeting once a month as it is required by the regulations of Hellenic

Capital Market. Boards require quite a long time (more than two hours) for their meetings which implies that the board puts great emphasis on monitoring and evaluation of their strategic decisions and provides a better judgement about strategic choices.

Table 4:5a Measures of Board Involvement in Strategic Decision-Making

<i>Board Involvement in SDMaking</i>	Response Scale							Scale Descriptive		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean	SD	n
<i>Formation of New Strategic Decisions</i>										
The board is not usually involved with the formation of the strategic decisions	42.6%	24.8%	6.9%	10.9%	5%	9.9%	N/A	2.40	1.68	101
The board usually ratifies strategic proposals which are formed solely by the TMT	2.9%	21.6%	13.7%	12.7%	12.7%	27.5%	8.8%	4.28	1.79	102
The board usually asks probing questions and then ratifies strategic proposals formed primarily by the TMT	5.8%	14.6%	5.8%	13.6%	26.2%	19.4%	14.6%	4.56	1.79	103
The board usually asks probing questions which lead to revisions of strategic proposals formed by the TMT	9.9%	18.8%	5.9%	19.8%	22.8%	13.9%	8.9%	4.03	1.82	101
The board usually helps to form strategic decisions with the TMT in board meetings	6.8%	9.7%	7.8%	9.7%	20.4%	27.2%	18.4%	4.82	1.83	103
The board usually helps the Top management to form strategic decisions within and between board meetings	3.9%	6.9%	11.8%	18.6%	14.7%	27.5%	16.7%	4.82	1.68	102
The board usually forms the strategic decisions separately from the TMT	17.5%	35.9%	10.7%	14.6%	1%	15.5%	4.9%	3.11	1.85	103
<i>Evaluation of Prior Strategic Decisions</i>										
The board is not usually involved with the monitoring of the progress of strategic decisions	22.8%	40.6%	9.9%	8.9%	7.9%	8.9%	1%	2.69	1.61	101
The board usually accepts the evaluation of strategic decisions by the TMT without asking probing questions	19.2%	39.4%	13.1%	10.1%	8.1%	10.1%	N/A	2.78	1.57	99
The board usually accepts the evaluation of strategic decisions by TMT after asking probing questions	3.1%	12.2%	8.2%	21.4%	26.5%	26.5%	2%	4.43	1.47	98
The board usually determines the timing and criteria of the evaluation but that information is supplied by TMT	1%	20.4%	6.1%	22.4%	31.6%	17.3%	1%	4.19	1.43	98
The board usually determines the timing and criteria of the evaluation and requests additional info	5%	8.9%	9.9%	21.8%	16.8%	31.7%	5.9%	4.55	1.60	101
The board usually collects its own info about the progress of the strategic decisions	3%	19.8%	6.9%	18.8%	15.8%	30.7%	5%	4.36	1.68	101

Scale: (1) "Strongly Disagree", (2) "Disagree", (3) "Slightly Disagree", (4) "Neither Agree or Disagree", (5) "Slightly Agree", (6) "Agree", (7) "Strongly Agree"

Board Involvement in SD Making	Table 4:5b Measures of Board Involvement in Strategic Decision-Making						Scale Descriptive	
	Response Scale							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean
Frequency of board meetings ^a	5%	3%	11.9%	55.4%	16.8%	7.9%	4.0	1.08
Duration of board meetings ^b	41.6%	27.7%	16.8%	9.9%	2%	25	4.0	1.21

a Scale: (1) One a year, (2) Every six months, (3) Quarterly, (4) Every month, (5) Every 15 days, (6) Weekly

b Scale: (1) More than two hours, (2) Two hours, (3) One and half hour, (4) One hour, (5) 30 Minutes, (6) Less than 30 minutes

4.7 Measures of Strategic Decision-Making Process: Descriptive Findings

Table 4:6 illustrates the survey responses for five dimensions of the strategic decision-making process: comprehensiveness/rationality of strategic decision making, financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

4.7.1 Measures of Comprehensiveness/Rationality

The comprehensiveness or rationality of strategic decision-making was captured by five variables. First, the responsibility of determining the cause of a problem, where the respondents were required to choose one of the following five options: no specific individual or group, one specific individual, two people jointly, an existing committee and finally, a specially formed group of three or more employees. 29.3% of the respondents confessed that they assign a specialised group of employees followed by 23.2% of directors who rely on one specific individual in order to address the cause of a problem.

Second, the attempt to determine the cause of a problem, where board members were asked to identify what their organisations would choose of the following in order to determine the cause of a problem: not rely on outsiders for assistance, rely on one or two outsiders for limited assistance, rely on a few outsiders for moderate assistance, rely on a few outsiders for significant help and finally, rely entirely on outsiders for significant assistance. The majority of Greek directors (31.6%) tend to rely on a few specialised outsiders for limited help and only 2% rely entirely on outsiders for determining the cause of a problem.

Third, the cause of the problem could be identified by asking directors how they determine the cause of a problem which could be through: ideas of single individual, informal discussions among managers, scheduled meetings among managers, scheduled meeting and analysis or scheduled meetings and extensive analysis. Most of the executives of Greek quoted organisations tend to identify possible causes of problems through formal scheduled meetings and careful analysis.

Fourth, the number of employees required to identify a cause of a problem. Descriptive findings have shown that the majority of Greek firms assign three to four employees in an effort to determine the cause of a problem.

Finally, fifth is the number of years of historical data required to address the cause of a problem where the majority of Greek directors confessed that within one year of historical data the board members are able to identify the cause of the problem.

4.7.2 *Measures of Financial Reporting*

The Table 4:6 illustrates the survey responses to the variables concerning the financial reporting as a significant factor of the strategic decision-making process. Board members were asked to what extent they use the following elements of financial reporting in their strategic decision-making process. Their responses were constructed on a seven point Likert scale varying between “*strongly disagree*” to “*strongly agree*” and significant findings are evident. Upon inspection of the calculated mean results, it was notable to observe that all elements of financial reporting were above the mid-point of 4. The majority of Greek directors agree that they use the following financial reporting elements in their strategic decision-making process: internal rate of return (34.4%), net present value as capital budgeting method (29.7%), inclusion of pro-forma financial statements (38.8%), detailed cost studies (38.9%) and finally, incorporation of strategic decision (48.9%).

4.7.3 *Measures of Rule Formalisation*

Table 4:6 depicts that the distribution of responses for rule formalisation. Respondents were asked to indicate the extent to which Boards of Directors use the following elements of rule formalisation. Their responses were constructed by a seven-point Likert scale ranging from “*strongly disagree*” to “*strongly agree*” and certain notable findings were evident. The mean score of the items that describe the rule formalisation were above mid-point of four. It is interesting to note that the vast majority of respondents rely on written procedures guiding the process (37.9%); on formal procedures to identify alternative ways of action (32.6%); on formal screening procedures (32.3%); on formal documents guiding the final decision (31.9%) and on predetermined criteria for strategic evaluation (32.3%). It is worth mentioning that recently Greek listed firms are required by law to disclose sound policies and formal procedures regarding their strategic decision-making process.

4.7.4 *Measures of Hierarchical Decentralisation*

The descriptive findings of the hierarchical decentralisation can be found in Table 4:6. Greek executives were asked to indicate to what extent the following individuals or groups: owner/shareholder, chief executive officer, first level directors, middle level management and lower level management are involved in the strategic decision-making process. Their responses were constructed on a seven-point Likert scale range from “*no involvement*” to “*active involvement*”. After careful examination of mean results, it was notably to observe that one hierarchical decentralisation issue was particularly low in their scoring. This specific variable refers to lower level management where the mean is equal to 2.94. The descriptive results reveal that in Greek boardrooms the lower level management does not actually participate in the strategic decision-making process. However, the remaining variables tended to exhibit results that are widely distributed throughout the seven-point scale, which, consequently, characterised mean scores above the mid-point of four. It is worth mentioning that in Greek listed organisations in ASE separate individuals or groups such as owner, CEO, first level director and middle level management compose the apex of the organisation and play a crucial role in their decisions.

4.7.5 *Measures of Lateral Communication*

Table 4:6 presents the descriptive findings generated from lateral communication. All the items that describe lateral communication tend to exhibit results that are widely distributed throughout the seven-point scale which, consequently, characterised mean scores above the mid-point of four. The results reveal that the departments of accounting, production, personnel and purchasing are actually involved in the strategic decision-making process in Greek organisations.

Strategic Decision-Making Process	Table 4:6 Measures of Strategic Decision-Making Process							Scale Descriptive		
	Response Scale							Mean	SD	n
	(1)	(2)	(3)	(4)	(5)	(6)	(7)			
Comprehensiveness /Rationality of SD Making										
Responsibility of determining the cause of a problem would be assigned ^a	19.2%	23.2%	7.1%	21.2%	29.3%	N/A	N/A	3.18	1.54	99
Attempt to determine the cause of a problem ^b	26.5%	31.6%	24.5%	15.3%	2%	N/A	N/A	2.34	1.09	98
Possible problem causes would be identified through ^c	9.4%	11.5%	18.8%	19.8%	40.6%	N/A	N/A	3.70	1.35	96
Number of employees involved in determining primarily through ^d	3.33%	54.5%	11.1%	1%	N/A	N/A	N/A	1.79	.66	99
Number of years of historical data used to determine the cause of a problem ^e	57.3%	15.6%	11.5%	7.3%	5.2%	N/A	3.1%	2.05	1.61	96
Financial Reporting^f										
Use of internal rate of return (IRR) as capital budgeting	7.8%	12.2%	5.6%	10%	15.6%	34.4%	14.4%	4.74	1.88	90
Use of net present value as capital budgeting method	6.6%	7.7%	4.4%	12.1%	17.6%	29.7%	22%	5.03	1.80	91
Inclusion of pro-forma financial statements	9.4%	9.4%	5.9%	11.8%	11.8%	38.8%	12.9%	4.75	1.89	85
Detailed cost studies	5.6%	2.2%	5.6%	N/A	23.3%	38.9%	24.4%	5.53	1.50	90
Incorporation of strategic decision	4.5%	4.5%	1.1%	11.4%	21.6%	48.9%	8%	5.19	1.44	88
Rule Formalisation^f										
Written procedures guiding the process	5.3%	2.1%	8.4%	11.6%	15.8%	37.9%	18.9%	5.20	1.61	95
Formal procedures to identify alternative ways of action	4.2%	6.3%	10.5%	17.9%	18.9%	32.6%	9.5%	4.76	1.58	95
Formal screening procedures	5.4%	7.5%	5.4%	12.9%	22.6%	32.3%	14%	4.92	1.66	93
Formal documents guiding the final decision	4.3%	9.6%	5.3%	19.1%	17.0%	31.9%	12.8%	4.81	1.66	94
Predetermined criteria for strategic evaluation	4.2%	10.4%	6.3%	20.8%	15.6%	32.3%	10.4%	4.71	1.65	96
Hierarchical Decentralisation^g										
Owner/Shareholders	4.0%	5.0%	5.9%	5.0%	4.0%	21.8%	54.5%	5.83	1.76	101
Chief Executive Officer	N/A	1.0%	N/A	1%	4%	19.8%	74.3%	6.64	.75	101
First level directors	N/A	2.0%	4.0%	6.0%	12.0%	45.0%	31.0%	5.87	1.16	100
Middle level management	7.1%	8.2%	7.1%	18.4%	43.9%	14.3%	1.0%	4.30	1.43	98
Lower level management	18.8%	16.7%	28.1%	24.0%	12.5%	N/A	N/A	2.94	1.29	96
Lateral Communication^g										
Finance-Accounting department	3.0%	1.0%	3.0%	5.9%	20.8%	35.6%	30.7%	5.70	1.36	101
Production department	6.0%	3.6%	10.7%	9.5%	19.0%	33.3%	17.9%	5.03	1.69	84
Personnel department	10.8%	7.5%	9.7%	21.5%	26.9%	18.3%	5.4%	4.22	1.68	93
Purchasing department	6.5%	1.1%	7.6%	9.8%	22.8%	38.0%	14.1%	5.11	1.58	92

Refer to Legend on the following page

^a Scale: (1) No specific individual or group, (2) One specific individual, (3) Two people jointly, (4) An existing committee of three or more employees, (5) A specially formed group of three or more employees

^bScale: (1) Not be willing to rely on outsiders for any assistance, (2) Be willing to rely on one or two outsiders to provide limited assistance, (3) Be willing to rely on one or two outsiders to moderate assistance, (4) Be willing to rely on outsiders for significant assistance, (5) Rely entirely on outsiders if necessary

^cScale: (1) The ideas of a single individual, (2) Informal discussions among managers, (3) Scheduled meetings among managers, (4) Scheduled meetings and some analysis, (5) Scheduled meetings and extensive analysis

^dScale: (1) Two or less, (2) Three to four, (3) Five to six, (4) Seven to eight, (5) Nine to ten, (6) Eleven to twelve, (7) More than twelve

^eScale: (1) Less than one, (2) One, (3) Two, (4) Three, (5) Four, (6) Five, (7) More than five

^f Scale: (1) “Strongly Disagree”, (2) “Disagree”, (3) “Slightly Disagree”, (4) Neither Agree or Disagree, (5) Slightly Agree, (6) Agree, (7) Strongly Agree

^g Scale: (1) No Involvement, (2) Very Low Involvement, (3) Low Involvement, (4) Moderate Involvement, (5) Involvement, (6) High Involvement, (7) Active Involvement

4.8 Measures of Innovation: Descriptive Findings

In order to examine to what extent Greek listed organisations emphasise innovation practices, board members were asked to rate their opinion across three dimensions of innovation namely product, process and organisational innovation. Responses were constructed on a seven point Likert scale ranging from “*low emphasis*” to “*extreme emphasis*”. Table 4:7 highlights the distribution of responses for these variables. Almost all the variables that measure innovation have mean values above the mean point of four.

With respect to the variable product innovation, it appeared that 40.4% of Greek directors agree that their company is the first in the industry to introduce new products or services. Furthermore, 34.8% of the firms focus on the creation of new products for fast market introduction while 40.9% emphasise creating new variations of existing product lines. Respondents confessed (32.6%) that the product innovation practices have led to increase of the revenue from less than three years old new products. Regarding the process innovation, Greek executives seem to emphasise on the introduction of new technology (33.3%), on technological improvements (40.2%), on creating innovative technologies (30.6%), on R&D (29.1%) and a few of them on developing new technology (22.1%). Overall, Greek directors encourage organisation innovation (26.1%) by encouraging initiatives and creativity among employees (33.7%) and support various organisational units that drive innovation (28.9%).

Table 4:7 Innovation											
Innovation Practices	Response Scale				Scale Descriptive						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Mean	SD	n	
Product Innovation^a											
Being the first company in the industry to introduce new product/services	4.5%	3.4%	4.5%	5.6%	22.5%	40.4%	19.1%	5.35	1.52	89	
Creating new products for fast market introduction	7.9%	2.2%	5.6%	6.7%	25.8%	34.8%	16.9%	5.12	1.67	89	
Creating new variations to existing product lines	4.5%	3.4%	2.3%	11.4%	22.7%	40.9%	14.8%	5.26	1.48	88	
Increasing the revenue from less than 3years old new products	7.0%	3.5%	3.5%	9.3%	31.4%	32.6%	12.8%	5.03	1.59	86	
Process Innovation^a											
Being the first company in the industry to introduce new technology	11.5%	3.4%	6.9%	6.9%	24.1%	33.3%	13.8%	4.83	1.84	87	
Being the first company in the industry to introduce technological improvements	10.3%	3.4%	6.9%	9.2%	16.1%	40.2%	13.8%	4.93	1.82	87	
Creating innovative technologies	12.9%	2.4%	11.8%	11.8%	22.4%	30.6%	8.2%	4.52	1.82	85	
Investing heavily in cutting edge process technology-oriented R&D	15.1%	5.8%	8.1%	18.6%	16.3%	29.1%	7.0%	4.30	1.89	86	
Developing radical new technology	19.8%	8.1%	10.5%	14.0%	18.6%	22.1%	7.0%	3.97	1.98	86	
Organisational Innovation^a											
Developing systems that encourage initiatives and creativity among employees	8.6%	4.3%	5.4%	10.9%	31.5%	33.7%	5.4%	4.75	1.62	92	
Encouraging innovation in the organisation	7.6%	4.3%	4.3%	18.5%	26.1%	26.1%	13.0%	4.81	1.65	92	
Supporting an organisational unit that drive innovation	10.0%	5.6%	5.6%	12.2%	28.9%	26.7%	11.1%	4.68	1.75	90	

^a Scale: (1) No Emphasis, (2) Very Low Emphasis, (3) Low Emphasis, (4) Moderate Emphasis, (5) Emphasis, (6) A Lot of Emphasis, (7) Extreme Emphasis

4.9 Measures of Company's Financial Performance: Descriptive Findings

In order to measure the organisational performance of Greek companies, directors were asked to indicate their relative performance (compared to competitors in the industry) of their firms across five indicators. The perception of executives regarding their organisational performance was considered to be high. Directors argued that their organisations join the top 20% of companies in the industry in terms of total assets, total sales, total sales growth, performance and success and competitive position. In a five-point likert scale that was constructed, Greek board members scored high in order to describe the financial situation of their firm as it can be seen from Table 4:9.

Financial Performance ^a	Response Scale					Scale		
	(1)	(2)	(3)	(4)	(5)	Mean	SD	n
After-tax return on total assets	10.0%	10.0%	24.4%	21.1%	34.4%	3.60	1.32	90
After-tax return on total sales	10.1%	10.1%	27.0%	21.3%	31.5%	3.53	1.30	89
Firm's total sales growth	4.4%	8.9%	17.8%	25.6%	43.3%	3.94	1.17	90
Overall firm performance and success	3.5%	4.7%	20.0%	25.9%	45.9%	4.05	1.08	85
Our competitive position	2.2%	3.4%	14.8%	33.0%	46.6%	4.18	.96	88

^a Scale: (1) Lowest 20%, (2) Lower 20%, (3) Middle 20%, (4) Next 20%, (5) Top 20%

4.10 Concluding Remarks

This chapter has documented the descriptive findings from 105 listed organisations in the ASE. In general, most measures observed a wide range of responses. This concluded with a diversity of responses to the same questions. Also, it suggests that there was significant variation among these data which represents justification in considering correlation and multiple regression analyses. The results of these bivariate and multivariate analyses are presented in the following chapter accompanied by extensive discussion of the findings.

CHAPTER 5

Principal Component Analysis and Construction of Scale Indices

5.1 Introduction

The purpose of this chapter is to present and discuss multivariate statistical methods in order to analyse the data and investigate the interrelationship between the constructs and among the variables within each construct.

Due to the presence of a large number of variables within each construct, correlation matrices were constructed in order to define a set of common underlying dimensions, known as factors (Hair, Anderson, Tatham and Black, 1998). Therefore, principal component analysis was executed upon selected data in order to extract composite dimensions underlying many of the constructs. In order for extracted factors to form the basis of subsequent statistical analysis, additive scales were constructed from the derived factor solutions, subject to tests for scale reliability and validity. The technical procedures and the justification for using factor analysis were discussed in Chapter Three.

5.2 Correlation Analysis with Selected Constructs

In Chapter Three, factors referred to hypothetical constructs developed to explain the intercorrelations among the variables (Robson, 2002). In order to identify that a set of variables have something in common, we have to conduct a bivariate correlation analysis within selected constructs. Conducting Pearson product-moment correlation we are able to identify the relationships between each of the variables of the construct. Therefore, we conducted Pearson correlation in order to measure the extent of any relationship between each of the variables within the measures of external corporate environment, involvement in strategic decision-making, strategic decision-making process, innovation and performance (Appendix D, D:1, D:2, D:3, D:4, D:5, D:6, D:7, D:8).

Upon inspection of each of these matrices it was observed that a large number of inter-correlations existed within many of the construct measures. However, a more accurate method for analysing such complex relationships by using a mathematical model is the principal component analysis. Principal component analysis merely decomposes the original data into a set of linear variates (Dunteman, 1989). Therefore, a process of factor extraction was performed in order to reduce a data set in a more manageable size maintaining the original information. The Table 5:1a and Table 5:1b present the factors as

well as variables attributed to each construct by using two different extraction techniques: eigenvalue greater than one and defined number of extracted factors.

5.3 Principal Component Analysis Method

The principal component analysis technique was discussed, in detail, in Chapter Three. However, the main procedure will be described briefly. Principal component analysis was executed in order to reduce the data. Principal component analysis assumes no unique or error variance and is concerned with establishing which linear components exist within the data and how a particular variable might contribute to the component. Varimax orthogonal rotation was employed in order to produce factor solutions because it simplifies the interpretation of factors and attempts to maximise the dispersion of loadings within factors.

Factor analysis is a data reduction method that is used as a tool in an attempt to reduce a large set of variables to a more meaningful smaller set of variables. Because each variable was measured by multi-item constructs, factor analysis with varimax was adopted to check the unidimensionality among items. The researcher conducted two types of principal component analyses. In the first case, the factors were extracted naturally which show how the variables load to each factor regardless of the existing literature. In that case, an explanatory factor analysis was conducted; where specific factors were extracted according to specific data set. Factors were extracted according to how certain variables describe each construct within the Greek cultural context. In this case, factors were extracted according to how Greek executives perceive certain constructs. The researcher has labelled the factors according to the literature and according to items that better describe each factor. In the second case, the researcher employed factor analysis by specifying the number of the extracted factors as they exist in the existing literature review. The labels were given according to existing literature.

Table 5:1a Factors and Variables Attributable to Each Construct (Factors with Eigenvalue over One)		
Construct	Number of Factors	Number of Variables
Environment	4	17
ENV1:Environmental Dynamism in Marketing Practices	1	5
ENV2:Environmental Customer Dynamism	1	3
ENV3:Environmental Competitor's Dynamism	1	4
ENV4:Environmental Complexity-Munificence	1	5
Involvement in SD Making	3	9
INVSDM1 Formation and Process of SDM	1	4
INVSDM2 Formation and Evaluation of SDM	1	3
INVSDM3 Evaluation of SDM	1	2
SD Making Process	5	19
FINREP: Financial Reporting	1	5
RULEFORM: Rule Formalisation	1	5
<i>Hierarchical Decentralisation</i>	2	5
HIERDECENT1:Lower Level Management	1	2
HIERDECENT2:Upper Level Management	1	3
LATCOM: Lateral Communication	1	4
Innovation	2	12
INNV1:Product &Process Innovation	1	9
INNV2:Organisational Innovation	1	3
ORGPREF: Performance	1	5
Total	15	64

Table 5:1b Factors and Variables Attributable to Each Construct (Specifying the Number of Factors)		
Construct	Number of Factors	Number of Variables
Environment	3	14
ENV1:Environmental Dynamism	1	8
ENV2:Environmental Munificence/Hostility	1	3
ENV3:Environmental Complexity	1	3
Involvement in SD Making	2	9
INVSDM1:Formation of Strategic Decision-Making Process	1	4
INVSDM2:Evaluation of Strategic Decision-Making Process	1	5
SD Making Process	4	19
FINREP: Financial Reporting	1	5
RULEFORM: Rule Formalisation	1	5
HIERDECENT: Hierarchical Decentralisation	1	5
LATCOM: Lateral Communication	1	4
Innovation	1	4
INNP: Product Innovation	1	4
INNPC: Process Innovation	1	5
INNORG: Organisational Innovation	1	3
ORGPREF: Performance	1	5
Total	13	59

The extract dialog box provides options pertaining to the retention of factors. In this chapter, we will present the factors that are extracted by the eigenvalue being greater than one and the factors that are extracted by specified number of factors.

The results from principal component analysis indicated that fifteen factors were extracted with eigen value greater than one and thirteen by specifying the number of variables as presented in Tables 5:1a and 5:1b.

5.4 Principal Component Analysis of External Corporate Environment

5.4.1 Factor Structure

Principal component analysis with varimax rotation was performed on the set of eighteen environmental dimensions in order to identify underlying dimensions for the purposes of scale development. Four factors with eigenvalues greater than one were extracted. Two factors were extracted from the set of environmental dynamism and two other factors with a mix of elements of environmental complexity and environmental munificence. In order to enhance the factor solution of principal component analysis one item was deleted from the analysis because it lacked variations and caused interpretability problems at conceptual level. This item was: little threat to the survival and well-being of the company. This item was excluded from the analysis, because it did not correlate high with the sum of the variables that describe environmental munificence or hostility.

The principal component analysis of the external corporate environment measures can be found in Table 5:2a. The factor configuration presented in Table 5:2a indicates that the first four factors were found to explain the 68% of the total variance. The identification and labelling of the factors will now be discussed.

Table 5:2a Principal Component Analysis for External Corporate Environment					
	Factor Loadings				Communality
	ENV1	ENV2	ENV3	ENV4	
	Dynamism in Marketing Practices	Customer Dynamism	Environmental Competitor's Dynamism	Environmental Complexity-Munificence	
Changes in the sales promotion/advertising strategies	.874	.096	-.015	.157	.799
Changes in the sales strategies	.844	.055	.120	.226	.781
Changes in the mix of products/brands carried	.739	.310	.176	.001	.674
Increase in the needed diversity in your production methods and marketing tactics to cater your different customers	.657	.238	.217	.163	.562
Changes in the competitor's sales promotions/advertising strategies	.623	.273	.367	-.012	.597
Changes in the customer preferences of the product quality/price	.145	.788	.090	.141	.669
Changes in the customer preferences of the brands	.448	.767	.063	.090	.800
Changes in the customer preferences of the product features	.541	.645	.173	.052	.741
Influence of the market activities from your key competitors	.030	-.153	.821	.217	.746
Hostility in the market activities of your key competitors	.239	.265	.728	.197	.697
Changes in the competitor's sales strategies	.546	.301	.601	-.165	.777
Changes in the competitor's mix of products/brands	.539	.368	.587	-.059	.774
Rich in investment and marketing opportunities	-.088	.366	.303	.660	.669
Increase in the innovation rate of new operating processes and new products or services in your principal industry	.294	-.058	.232	.658	.577
An environment that the company can control and manipulate to its own advantage, such as a dominant firm has in an industry with little competition and few hindrances	-.328	.352	-.153	.646	.672
Predictability in the market activities of your key competitors in your sector	.190	-.095	.114	.632	.458
Predictability in the tastes and preferences of your customers in your principal industry during the recent years	.363	.300	-.254	.523	.560
Eigenvalue	6.611	2.065	1.618	1.258	
%variance explained (67.95)	38.887	12.145	9.517	7.401	

Note: Principal components analysis with varimax rotation, converging in 11 iterations

5.4.1.1 Factor 1: Environmental Dynamism in Marketing Practices (ENV1)

The first factor was composed of the following five variables: changes in the sales promotion/advertising strategies; changes in the sales strategies, changes in the mix of products/brands carried; increase in the needed diversity in production methods and marketing tactics to cater to different customers; and changes in the competitor's sales promotions/advertising strategies. The mean score for ENV1 was the highest among the extracted factors indicating that the majority of respondents perceived environmental dynamism was explained by this vector (mean=24.67, S.D.=6.03).

All the items within this factor were characterised by elements of marketing practices perceived and implemented by Greek board members and such elements have been recognised as key components in environmental dynamism practices in other studies (e.g. Tan and Tan, 2005; Zhang, 2006; Zhang, 2007; Sabherwal and King, 1992; Miller and Friesen, 1983; Aldrich, 1979; Child, 1972; Achrol and Stern, 1988; Waldman, Ramirez, House and Puranam, 2001; Dess and Beard, 1984; Rueda-Manzanares, Aragón-Correa and Sharma, 2007). It is worth mentioning that elements such as: increase in the needed diversity in promotion methods and marketing tactics to cater to different customers describe a complex rather than dynamic environment and changes in the competitor's sales promotions/advertising strategies portray mainly competitor's dynamism. This factor indicates that Greek executives implement these marketing strategies to address the customer demands and to differentiate from their competitors. Thus, the label *dynamism marketing practices* was considered to adequately convey the essence of the ENV1 factor.

5.4.1.2 Factor 2: Environmental Customer Dynamism (ENV2)

The second factor contained three variables: changes in the customer preferences of the product quality/price, changes in the customer preferences of the brands and changes in the customer preferences of the product features. The mean score of this factor was 14.63 and S.D= 3.63 which suggests that respondent executives were aware of their customers' preferences.

These variables referred to dimensions of customer dynamism (e.g. Dess and Beard, 1984; Tan and Tan, 2005; Zhang, 2006; Miller and Friesen, 1982; Balabanis and Spyropoulou,

2007). The label that best represented the items within this factor was believed to be *customer dynamism*.

5.4.1.3 Factor 3: Environmental Competitor's Dynamism (ENV3)

The third factor contained four variables: influence of the market activities from key competitors, hostility in the market activities of key competitors, changes in the competitor's sales strategies and changes in the competitor's mix of products/brands. The ENV3 factor emphasises the environment in which the competitors operate and on the changes that the competitors pursue. Nonetheless, these issues have been considered to represent competitor's environmental dynamism (Zhang, 2007; Lefebvre, Mason and Lefebvre, 1997). On the basis of conceptual consistency of the variables within this factor, it was considered most appropriate to assign the label *environmental competitor's dynamism* issues to ENV3.

5.4.1.4 Factor 4: Environmental Complexity-Munificence (ENV4)

The fourth factor contained five variables: rich in investment and marketing opportunities; increase in the innovation rate of new operating processes and new products or services in the principal industry; an environment that the company can control and manipulate to its own advantage, such as that a dominant firm has an industry with little competition and few hindrances; predictability in the market activities of the key competitors in the sector; and, predictability in the tastes and preferences of the customers in the principal industry during the recent years. This factor consists of elements of two distinct environmental factors; the environmental complexity and the environmental munificence. Issues of these two elements have been considered to represent environmental dimensions in a number of studies (Miller and Friesen, 1983; Sabherwal and King, 1992; Miller, 1988; Dess and Beard, 1984). On the basis that this factor combines elements of two factors, it was considered most suitable to assign the label *environmental complexity/munificence* to ENV4.

The purpose of this section was to illustrate the results of a data reduction technique as it applied to the empirical data generated for environmental measures. The principal component analysis resulted in a four-factor solution: dynamism in marketing strategies,

customer dynamism, environmental competitor's dynamism as well as environmental complexity-munificence.

5.5 Principal Component Analysis for External Corporate Environment (Specifying the number of factors)

5.5.1 Factor Structure

In order to enhance the factor solution of principal component analysis of external corporate environment, four variables were dropped from the analysis because they either lacked variation or caused interpretability problems at conceptual level. The items that have been excluded did not highly correlate with the sum of the environmental dimensions. These items were: hostility in the market activities of key competitors, influence of the market activities from key competitors, increase in the needed diversity in production methods and marketing tactics to cater to different customers and finally, little threat to the survival and well-being of the company.

The principal component analysis of external corporate environment can be found in Table 5:2b. The factor configuration presented in Table 5:2b indicates that the first three factors were found to explain 64% of the total variance. The identification and labelling of these factors will be discussed below.

	Factor Loadings			Communality
	ENV1	ENV2	ENV3	
	Environmental Dynamism	Environmental Munificence/Hostility	Environmental Complexity	
Changes in the Competitor's Sales Strategies	.836	.068	-.026	.705
Changes in the Competitor's Mix of Products/Brands	.810	.188	.028	.692
Changes in the Mix of Products/Brands Carried	.792	.115	.143	.661
Changes in the Competitor's Sales Promotions/Advertising Strategies	.760	.067	.145	.603
Changes in the Sales Strategies	.734	-.034	.420	.716
Changes in the Customer Preferences of the Product Feature	.716	.457	.077	.728
Changes in the Sales Promotion/Advertising Strategies	.714	-.025	.339	.625
Changes in the Customer Preferences of the Brands	.612	.611	.040	.749
Changes in the Customer Preferences of the Product Quality/Price	.362	.761	-.048	.712
Environment of the Company Can Control and Manipulate to its Own Advantage	-.381	.639	.377	.695
Rich in Investment and Marketing Opportunities	.005	.564	.494	.562
Predictability in the Market Activities of Your Key Competitors	.073	.010	.730	.538
Increase in the Innovation Rate of New Operating Processes and New Products	.200	.093	.719	.566
Predictability in the Tastes and Preferences of your Customers	.207	.367	.511	.439
Eigenvalue	5.677	2.060	1.252	
%variance explained (64.20)	40.549	14.716	8.944	

Note: Principal components analysis with varimax rotation, converging in 8 iterations

5.5.1.1 Factor 1: Environmental Dynamism (ENV1)

The first factor identified from the analysis contained eight items which itself accounted for 40.5% of the total variance and exhibited an eigenvalue of 5.6. The items that loaded heavily onto this factor were: changes in the competitor's sales strategies; changes in the competitor's mix of products/brands; changes in the mix of products/brands carried; changes in the competitor's sales promotions/advertising strategies; changes in the sales strategies; changes in the customer preferences of the product feature; changes in the sales promotion/advertising strategies; and changes in the customer preferences of the brands. The conceptual association between these variables is referred to as environmental dynamism in several studies (Dess and Beard, 1984; Tan and Tan, 2005; Zhang, 2006; Miller and Friesen, 1982,1983; Balabanis and Spyropoulou, 2007; Sabherwal and King,

1992; Aldrich, 1979; Child, 1972; Achrol and Stern, 1988) which is reflected in the mean score of ENV1 scale 38.79 and S.D. =8.49. There was found to be a clear information theme to the elements comprising ENV1 and the same items were found to load onto Dess and Beard (1984) *environmental dynamism factor* and more specifically under dynamism in marketing practices, competitor's dynamism and customer dynamism. Thus, this factor was labelled ENV1 as environmental dynamism.

5.5.1.2 Factor 2: Environmental Hostility/Munificence (ENV2)

The variables found to load ENV2 were: changes in the customer preferences of the product quality/price; environment of the company can control and manipulate to its own advantage; and, rich in investment and marketing opportunities. The last two items were considered to represent the environmental munificence or otherwise hostility in a number of studies (Dess and Beard, 1984; Sabherwal and King, 1992; Tan and Tan, 2005; Balabanis and Spyropoulou, 2007). However, the item: change in the customer preferences of the product quality/price represents environmental dynamism rather than environmental hostility. On the basis of conceptual consistency of the variables within the factor, it was considered most suitable to assign the label environmental hostility/munificence issues to ENV2.

5.5.1.3 Factor 3: Environmental Complexity/Homogeneity-Heterogeneity (ENV3)

The third factor contained three items: predictability in the market activities of key competitors; increase in the innovation rate of new operating processes and new products and predictability in the tastes and preferences of customers. Strategic management researchers have emphasised these items to describe environmental complexity or homogeneity/ heterogeneity (Rueda-Manzanares, Aragón-Correa and Sharma, 2007; Dess and Beard, 1984; Sabherwal and King, 1992). The mean value of ENV3 was 15.86 and S.D. = 2.72 indicating a low regard attached by respondents to perceive environmental complexity in the environment in which their organisations operate. The three-item factor was assigned the label of *environmental complexity/homogeneity-heterogeneity*.

This section aimed to demonstrate the findings of a data reduction technique applied to empirical data generated from external corporate environment. The principal component analysis procedure was performed on these data by forcing the number of factors and a three-factor solution was extracted. It is worth mentioning that after the extraction of the factors a few items ended up overlapping between two factors and not necessarily

describing a single factor. The factor structure satisfied the statistical and conceptual criteria and afterwards was used for scale reliability and validity.

5.6 Principal Component Analysis of Involvement in Strategic Decision-Making Process (eigenvalue greater than one)

5.6.1 Factor Structure

In order to enhance the factor solution of principal component analysis of involvement in strategic decision process, four variables were dropped from the analysis because they caused interpretability problems at conceptual level. These items were: the board is not usually involved with the formation of the strategic decisions, the board usually forms the strategic decisions separately from the top management, the board is not usually involved with the monitoring of the progress of strategic decisions and the board usually accepts the evaluation of strategic decisions by top management without asking probing questions. These items were excluded from the factor analysis because they did not correlate above .30 with the sum of items of each factor. More specifically, the variable: the board usually accepts the evaluation of strategic decisions by top management without asking probing questions correlated with the sum of evaluation items at .049, the variable: the board is not usually involved with the formation of strategic decisions correlated with the sum of formation items at .252, the variable: the board is not usually involved with the monitoring of the progress of strategic decisions correlates with the sum of evaluation items at .202 and finally, the variable: the board usually forms the strategic decisions separately from the top management correlates with the sum of formation items in the strategic decision-making process at .049. The above variables have been excluded from our principal component analysis due to the fact they lack variation and they cause problems with interpretation. The principal components analysis of involvement in strategic decision making with eigenvalue greater than one can be found in Table 5:3a. The factor configuration presented in Table 5:3a indicates that the first three factors were found to explain 70% of the total variance. The identification and labelling of these factors will be discussed below.

5. 6.1.1 Factor 1: Formation and Process of Strategic Decision–Making Process (INVSDM1)

The first factor identified from the analysis contained four variables which accounted for 39% of the total variance and exhibited an eigenvalue of 3.5. The items that loaded heavily onto this factor were: the board usually helps the top management to form strategic decisions within and between board meetings; the board usually determines the timing and criteria of the evaluation and requests additional information; the board usually helps to form strategic decisions with the top management team in board meetings and the board usually collects its own information about the progress of the strategic decisions. These issues have been advanced as the formation of the strategic decision-making process by Leidner et al., 1999; Ashmos, Duchon and McDaniel, 1998; Floyd and Wooldridge, 1992; Buchholtz et al., 2005; Judge and Zeithaml, 1992; Ruigrok, Peck and Keller, 2006.

These variables were found to describe clearly the strategic decision-making process as similar variables have been found to load onto Judge and Zeithaml (1992, p.781) “*formation involvement*” factor, Obeng and Ugboro (2005, p. 60) “*periodic review of organisation’s mission*” factor, and a factor proposed by Leidner et al (1999) entitled “*extent of analysis in decision making*”. Thus, the decision was taken to label INVSDM1 as formation and process of strategic decision because it combines elements from both formation and process of strategic decisions.

5. 6.1.2 Factor 2: Formation and Evaluation of Strategic Decision–Making Process (INVSDM2)

The variables found to load onto INVSDM2 were: the board usually asks probing questions and then ratifies strategic proposals formed primarily by the TMT; the board usually asks probing questions which lead to revisions of strategic proposals formed by the TMT; the board usually ratifies strategic proposals which are formed solely by the TMT. All these items visibly describe the formation and evaluation stage of the strategic decision-making process and were collectively held in relatively high regarding according to survey respondents (mean= 12.81; SD=4.48). Nonetheless, these issues have been considered to represent the formation and evaluation of the strategic decision-making process in numerous studies (e.g. Dess, Lumpkin and Covin, 1997; Judge and Zeithaml, 1992; Ruigrok, Peck and Keller, 2006; Johnson, Hoskisson and Hitt, 1993). On the basis of

conceptual consistency of the variables within the factor, it was considered most suitable to assign the label formation and evaluation of strategic decision-making process.

5. 6.1.3 Factor 3: Evaluation of Strategic Decision –Making Process (INVSDM3)

The third factor actually is a continuation of the second factor since it consists of two items that are limited in the description of evaluation of strategic decision making: the board usually determines the timing and criteria of the evaluation but that information is supplied by TMT and the board usually accepts the evaluation of strategic decisions by TMT after asking probing questions. Similar items have been used to determine decision activities as well as timing of the group participation in process (Ashmos, Duchon and McDaniel, 1998). The mean value of INVSDM3 was 8.57 and S.D=2.48 which suggests that across the whole respondent set, these were held in relatively high regard. Due to the cohesiveness between these two items it was deemed appropriate to select the title of evaluation of strategic decision-making process for this factor.

This section aimed to illustrate the findings of a data reduction technique applied to empirical data generated from involvement in strategic decision-making measures. Principal component analysis procedure was performed on these data and a three factor solution was extracted. The factors were used afterwards in order to test reliability and validity of the construct.

Table 5:3a Principal Component Analysis for Involvement in Strategic Decision-Making Process				
	Factor Loadings			Communality
	INVSDM1	INVSDM2	INVSDM3	
	Formation & Process of SDM	Formation & Evaluation of SDM	Evaluation of SDM	
The Board Usually helps the Top Management to Form Strategic Decisions within and Between Board Meetings	.767	.257	-.033	.655
The Board Usually Determines the Timing and Criteria of the Evaluation and Requests Additional Info	.757	.074	.416	.752
The Board Usually Helps to Form Strategic Decisions with the TMT in Board Meetings	.743	.384	.059	.703
The Board Usually Collects its Own Info About the Progress of the Strategic Decisions	.638	-.141	-.046	.430
The Board Usually Asks Probing Questions and then Ratifies Strategic Proposals Formed Primarily by the TMT	.185	.877	.156	.828
The Board Usually Asks probing Questions which Lead to Revisions of Strategic Proposals Formed by the TMT	.412	.763	.094	.761
The Board Usually Ratifies Strategic Proposals which are Formed Solely by the TMT	-.145	.734	.335	.672
The Board Usually Determines the Timing and Criteria of the Evaluation but that Information is Supplied by TMT	.188	.095	.870	.665
The Board Usually Accepts the Evaluation of Strategic Decisions by TMT After Asking Probing Questions	-.090	.366	.723	.801
Eigenvalue	3.554	1.702	1.011	
%variance explained (69.62)	39.484	18.907	11.229	

Note: Principal components analysis with varimax rotation, converging in 6 iterations

5.7 Principal Component Analysis of Involvement in Strategic Decision Making Process (specified the number of factors)

5.7.1 Factor Structure

In accordance with accepted principal components procedure four variables were deleted from this analysis because they were found to either lack variation or cause interpretability problems. These items were: the board usually forms the strategic decisions separately from the top management; the board is not usually involved with the monitoring of the progress of strategic decisions; the board usually accepts the evaluation of strategic decisions by the top management without asking probing questions; the board usually collects its own information about the progress of strategic decision, in addition to the top management reports.

The principal component analysis of involvement in the strategic decision-making process can be found in Table 5:3b. The factor configuration indicated that these two factors explained almost 61% of the total variance. The identification and labelling of these extracted factors will now be discussed.

5.7.1.1 Factor 1: Formation of Strategic Decision –Making Process (INVSDM1)

This factor was found to attract four variables which itself accounted for 40% of the total variance. The items that loaded onto INVSDM1 were: the board usually helps to form strategic decisions with the TMT in board meetings; the board usually helps the top management to form strategic decisions within and between board meetings; the board usually determines the timing and criteria of the evaluation and requests additional information and the board usually asks probing questions which lead to revisions of strategic proposals formed by the TMT.

Researchers have frequently cited these issues as the formulation stage of involvement in the strategic decision-making process (e.g. Judge and Zeithaml, 1992; Johnson, Hoskisson and Hitt, 1993; Leidner et al., 1999; Floyd and Wooldridge, 1992; Obeng and Ugboro, 2005) and obviously there is a conceptual association between the items.

The mean score of the INVSDM1 factor was with 18.25 (SD=5.50) with a score of above 5 representing the fact that most of the Greek executives of listed corporations actually participate in strategic decision-making process and mainly in its formation process. This factor was given the label of formation of strategic decision-making process as suggested by Judge and Zeithaml (1992).

5.7.1.2 Factor 2: Evaluation of Strategic Decision–Making Process (INVSDM2)

The second factor was characterised by five heavily loaded items: the board usually ratifies strategic proposals which are formed solely by the TMT; the board usually accepts the evaluation of strategic decisions by TMT after asking probing questions; the board usually asks probing questions and then ratifies strategic proposals formed primarily by the TMT; the board usually determines the timing and criteria of the evaluation but that information is supplied by TMT and the board is not usually involved with the formation of the strategic decisions. The mean score for this factor scale was 19.75 (S.D=5.48) suggesting that the Greek directors are involved in several stages of the strategic decision-making process. These issues of board involvement in strategic decision-making have been widely

cited as elements of involvement in strategic decisions by several writers (e.g. Obeng and Ugboro, 2005; Ashmos, Duchon and McDaniel, 1998; Ruigrok, Peck and Keller, 2006) and given their conceptual association of evaluation of strategic decision-making process reflected in Judge and Zeithaml (1992).

This section aimed to illustrate the findings of data reduction technique applied to empirical data generated from involvement in strategic decision-making process. Principal component analysis was performed on these data and a two-factor solution extracted (by specifying the number of factors) as well as a three-factor solution (with eigenvalue over one). The factor structure satisfied the statistical and conceptual criteria for selection and the extracted factors for board involvement in strategic decision-making are: formation and evaluation of the strategic decision-making process which are subsequently used in validity and reliability tests.

Table 5:3b Principal Component Analysis for Involvement in Strategic Decision-Making			
	Factor Loadings		Community
	INVSDM1	INVSDM2	
	Formation of SDM	Evaluation of SDM	
The Board Usually Helps to Form Strategic Decisions with the TMT in Board Meetings	.866	.095	.760
The Board Usually Helps the Top Management to Form Strategic Decisions within and Between Board Meetings	.809	-.006	.654
The Board Usually Determines the Timing and Criteria of the Evaluation and Requests Additional Info	.690	.238	.533
The Board usually Asks probing Questions which Lead to Revisions of Strategic Proposals Formed by the TMT	.665	.471	.664
The Board Usually Ratifies Strategic Proposals which are Formed Solely by the TMT	.058	.832	.695
The Board Usually Accepts the Evaluation of Strategic Decisions by TMT After Asking Probing Questions	.074	.724	.530
The Board Usually Asks Probing Questions and then Ratifies Strategic Proposals Formed Primarily by the TMT	.509	.634	.660
The Board Usually Determines the Timing and Criteria of the Evaluation but that Information is Supplied by TMT	.260	.576	.399
The Board is not Usually Involved with the Formation of the Strategic Decisions	-.507	.558	.568
Eigenvalue	3.596	1.865	
%variance explained (60.68)	39.959	20.728	

Note: Principal components analysis with varimax rotation, converging in 3 iterations

5.7.2 Concluding Remarks for Involvement in the Strategic Decision-Making Process

The factors that have been extracted above either with eigenvalue greater than one or by specifying the number of factors have indicated that the variables do not necessarily belong only to one factor. As the Tables 5:3a and 5:3b illustrate, there are items that are overlapping between two or more factors. This does not mean that the factor is not strong enough to explain thoroughly a construct but there are elements that can explain more than one construct. This is reasonable, since in a component analysis the unique variance becomes merged with the common variance to give hybrid “*common*” factors containing small proportions of unique variance (Child, 1973, p. 36). Several elements can explain more than one factor, because all the factors that are extracted attempt to operationalise a construct. In addition, Schilderink (1977) argued that the purpose of factor analysis is to examine the effect of general factors which are present in more than one variable at the same time. Specifically, the formation and evaluation stage of board involvement in the strategic decision-making process contain overlapping factors. The items that are supposed to describe a single factor were found to load to more than one factor.

5.8 Principal Component Analysis of Strategic Decision-Making Process

The principal component analysis of the strategic decision-making process falls into four distinctive categories: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. Principal component analysis allows identifying whether there are particular dimensions of the concept of the strategic decision-making process. The principal component analysis of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication can be found in Tables 5:4, 5:5, 5:6a, 5:6b, 5:7.

5.8.1 Principal Component Analysis of Financial Reporting

The principal component analysis of financial reporting is displayed in Table 5:4. The outcome of principal component analysis with eigenvalue greater than generated one factor explained 59% of the total variance. In the case of one factor extracted no rotation of the data matrix is possible. The solution was characterised by strong individual loadings ranging from 0.68 to 0.84 indicating a robust and comprehensive structure. The loadings of five financial reporting measurements onto a factor enhance the understanding of financial reporting and are consistent with previous studies (e.g. King, 2000; March et al., 1988,

Stein, 1980; Papadakis, Lioukas and Chambers, 1998 (Cronbach alpha: 0.90); Papadakis, 1998).

The extracted factor captured the use of net present value as capital budgeting method, the incorporation of strategic decisions, inclusion of proforma financial statements, detailed cost studies and use of internal rate of return. As a result, the solution was accepted and the factor was named financial reporting with the shorthand expression of FINREP being ascribed to it.

Table 5:4 Principal Component Analysis for Financial Reporting		
	Factor Loadings	Communality
	FINREP	
	Financial Reporting Indicators	
Use of Net Present Value as Capital Budgeting Method	.845	.714
Incorporation of Strategic Decision	.819	.670
Inclusion of Pro-Forma Financial Statements	.766	.587
Detailed Cost Studies	.699	.488
Use of Internal Rate of Return (IRR) as Capital Budgeting Method	.688	.473
Eigenvalue	2.933	
% variance explained (58.65)	58.654	

Note: Principal Component Analysis with a single factor extracted

5.8.2 Principal Component Analysis of Rule Formalisation

Principal component analysis of financial reporting is displayed in table 5:5. The outcome of principal component analysis with eigenvalue greater than one produced one factor that explained 76% of the total variance. In the case of a single factor extracted no rotation of the data matrix was possible. The solution was characterised by strong individual loadings ranging from 0.84 to 0.92 demonstrating a substantial influence of factor to explain thoroughly the rule formalisation as a dominant parameter in the strategic decision-making process. The sample items of rule formalisation included existence of written procedures guiding the process, the existence of formal procedures to identify alternative ways of action, formal screening procedures, and formal documents guiding the final decision and predetermined criteria for strategic decision evaluation. Nonetheless, other studies have provided evidence to suggest the overwhelming significance of these items in rule formalisation (e.g. King, 2000; Stein, 1980; Papadakis, Lioukas and Chambers, 1998; Papadakis, 2006; Papadakis, 1998). The five item factor was assigned the label rule formalisation.

Table 5:5 Principal Component Analysis for Rule Formalisation		
	Factor Loadings	Communality
	RULEFORM	
	Rule Formalisation	
Formal Procedures to Identify Alternative Ways of Action	.921	.848
Written Procedures Guiding the Process	.872	.760
Formal Documents Guiding the Final Decision	.866	.751
Formal Screening Procedures	.861	.741
Pretermind Criteria for Strategic Decision Evaluation	.842	.709
Eigenvalue	3.808	
%variance explained (76.16)	76.163	

Note: Principal Component Analysis with a single factor extracted

5.8.3 Principal Component Analysis of Hierarchical Decentralisation

Principal component analysis of hierarchical decentralisation generated two outcomes. The first outcome with eigenvalue greater than one produced two factors whereas the second after identified the number of factors generated one factor with five items. According to our theoretical model, the principal component analysis was supposed to generate one factor as in many studies in the strategic decision-making literature. However, the principal component analysis of our data extracted two factors instead of one. In both cases the principal component analysis presented in Tables 5:5a and 5:5b.

As Table 5:6a presents, two factors resulted after principal component analysis.

The first factor that explained the 51 percent of the total variance designated that lower and middle management are involved in the strategic decision-making process. The second factor identified an association between three variables: Chief Executive Officer, Owner/Shareholder and first level directors. The results extracted from principal component analysis show that several individuals are active in the strategic decision-making process. Therefore, they have been classified into two district factors: the lower level management and upper level management factor.

Regarding the principal component analysis that has been extracted by forcing the number of factors, as it can be seen for Table 5:6b only one factor was generated that explained the 51 percent of the total variance. This factor contained five items: CEO, owner/shareholder first level directors, middle level director and lower level management. These items have been acknowledged as important in amplifying individuals' involvement in the strategic decision-making process by several scholars (e.g. Tannenbaum, 1968; Grinyer et al. 1986;

Papadakis, 1998; Papadakis, Lioukas and Chambers, 1998; Papadakis and Barwise, 1998, 2002; Papadakis, 2006). It seems that should be a general tendency among respondent directors to perceive high involvement in the strategic decision-making of their firms. This conceptual association between items meant that the label of hierarchical decentralisation would accurately represent one aspect of strategic decision-making process.

Table 5:6a Principal Component Analysis for Hierarchical Decentralisation			
	Factor Loadings		Communality
	HIERDECENT1	HIERDECENT2	
	Lower Level Management	Upper Level Management	
Middle Level Management	.904	.213	.863
Lower Level Management	.889	-.020	.791
Chief Executive Officer	.164	.834	.722
Owner/Shareholders	-.016	.752	.565
First level Directors	.585	.638	.748
Eigenvalue	2.530	1.160	
%variance explained(73.8)	50.604	23.196	

Note: Principal components analysis with varimax rotation, converging in 3 iterations

Table 5:6b Principal Component Analysis for Hierarchical Decentralisation		
	Factor Loadings	Communality
	HIERDECENT	
First level Directors	.857	.734
Middle Level Management	.834	.695
Lower Level Management	.674	.454
Chief Executive Officer	.657	.431
Owner/Shareholders	.465	.216
Eigenvalue	2.530	
%variance explained(50.60)	50.604	

Note: Principal Component Analysis with a single factor extracted.

5.8.4 Principal Component Analysis of Lateral Communication

Principal component analysis of lateral communication can be found in Table 5:7. The outcome of principal component analysis with eigenvalue greater than one generated one factor which explained 62 percent of the total variance. The solution was characterised by high loadings ranging from 0.73 to 0.82 demonstrating clear understanding of the construct. The mean score of this factor scale was 20.18 (SD=4.92) suggesting a high involvement of several departments in the strategic decision-making process. The four items within this factor were: finance-accounting department, production department, personnel department and purchasing department. Participation of different departments in the strategic decision-making process within the organisation has been highlighted by several scholars (e.g. Papadakis, 2006; Papadakis and Barwise, 1998, 2002; Papadakis,

Lioukas and Chambers, 1998; Tannenbaum, 1968, Papadakis, 1998) and given that these items loaded onto a single factor, it was decided to assign the LATCOM factor with the label lateral communication. This factor has been approved and will be used for reliability and validity analysis.

Table 5:7 Principal Component Analysis for Lateral Communication		
	Factor Loadings	Communality
	LATCOM	
	Lateral Communication	
Purchasing Department	.829	.687
Production Department	.812	.659
Personnel Department	.768	.589
Finance-Accounting Department	.734	.539
Eigenvalue	2.474	
%variance explained (61.85)	61.859	

Note: Principal Component Analysis with a single factor extracted

5.9 Principal Component Analysis of Innovation Measures (eigenvalue greater than one)

5.9.1 Factor Structure

Principal component analysis of the innovation measures can be found in Table 5:4a. The factor configuration presented in table 5:8a indicates that the first two factors can explain the 78 per cent of the total variance. According to the theoretical model, it is expected to derive three factors that explain the construct of innovation. Instead, two factors were derived and each factor presented in table below has an eigenvalue greater than one. The justification and labelling of these two factors will be discussed.

5.9.1.1 Factor 1: Product and Process Innovation (INNV1)

This factor was composed of nine variables that each loaded heavily onto a vector generating an eigenvalue of almost eight. These variables are: creating new products for fast market introduction; being the first company in the industry to introduce new technology; being the first company in the industry to introduce technological improvements; creating new variations to existing product lines; creating innovative technologies; being the first company in the industry to introduce products/services; increasing the revenues from less than three years old new products; developing radical new technology and investing heavily in cutting edge process technology-oriented R&D. The first factor extracted was named INNV1 and it was given the factor label of product and process innovation. After conducting Pearson correlation between the sum of product

and process innovation and the variables that characterise the factor, high correlations among the items were identified.

There is a clear conceptual association among the ingredients of INNV1 which align them clearly with the factor of commitment to innovation that was provided by Zahra (1996). Items covered the creation and introduction of products, emphasis on R&D investments and commitment to patenting. These items also correspond to previous measurements of radical product innovation, strong R&D and patenting (Hitt and Tyler, 1991; Zahra, 1995). Other scholars (e.g. Daft and Becker, 1978; Miller, 1987; Subramanian and Nilakanta, 1996; Johannessen et al., 2001; Prajogo and Sohal, 2003) in order to measure the extent to which product and process innovation practices occur within their organisations, have used similar items including number of new products, number of patents, total research and expenditure, speed to market, “*being*” the first in the market, the newness of the new product as well as production lines. However, other scholars (e.g. Hoskisson, Hitt, Johnson and Grossman, 2002) have used the term “internal innovation” in an attempt to measure the R&D and the new product intensity.

5.9.1.2 Factor 2: Organisational Innovation (INNV2)

The second factor extracted from the innovation includes items namely: supporting an organisational unit that drive innovation; encouraging innovation in the organisation and developing systems that encourage initiatives and creativity among employees. These items have been used in previous studies to identify organisational innovation (e.g. Huse, 1994, 2005). The INNV2 will be given the factor label of organisational innovation. INNV2 attracted a high mean score of 13.54 (S.D= 4.22) suggesting that the respondents emphasise organisational innovation.

Table 5:8a Principal Component Analysis for Innovation Indicators			
	Factor Loadings		Communality
	INNV1	INNV2	
	Product & Process Innovation	Organisational Innovation	
Creating New Products for Fast Market Introduction	.858	.251	.798
Being the First Company in the Industry to Introduce New Technology	.846	.310	.812
Being the First Company in the Industry to Introduce Technological Improvements	.836	.395	.855
Creating New Variations to Existing Product Lines	.825	.246	.742
Creating Innovative Technologies	.824	.362	.810
Being the First Company in the Industry to Introduce new Products/Services	.791	.226	.677
Increasing the Revenue from less than 3 Years Old New Products	.754	.218	.616
Developing Radical New Technology	.689	.448	.676
Investing Heavily in Cutting Edge Process Technology-Oriented R&D	.682	.464	.681
Supporting an Organisational Unit that Drive Innovation	.287	.913	.916
Encouraging Innovation in the Organisation	.281	.907	.902
Developing Systems that Encourage Initiatives and Creativity among Employees	.347	.847	.838
Eigenvalue	7.999	1.323	
%variance explained(77.68)	66.659	11.028	

Note: Principal components analysis with varimax rotation

5.10 Factor Structure (specified number of factors)

Principal component analysis of the innovation measures with forced factors can be found in Table 5:8b indicating that the three factors can explain the 86 per cent of the total variance. Following the theoretical framework of the study, three factors were extracted. Similarly, Huse (1994, 2005) generated three factors that explain the corporate innovation: product innovation (4 items), process innovation (5 items) and organisational innovation (3 items). The justification and labelling of these three factors will be discussed.

5.10.1 Factor 1: Product Innovation (INNPD)

The first factor composed by five items that each loaded heavily onto a vector generating an eigenvalue of almost eight. These variables are: increasing the revenue from less than 3 years old new products; creating new products for fast market introduction; creating new variations to existing product lines, and finally, being the first company in the industry to introduce new products and services.

There is a clear conceptual association among the items of product innovation which align themselves with factors provided by Agarwal and Bayus, 2002; Ali, Krapfel and LaBahn, 1995; Schmidt and Calantone, 1998; Cooper, 1979; Lawton and Parasuraman, 1980; Kleinschmidt and Cooper, 1991 who have labelled their comparative factors “*product innovativeness*” or otherwise “*product newness*”. In order to be consistent with previous studies, INNPD will be given the factor label of product innovation.

The mean score for INNPD scale was 20.77 and SD=5.14 on a seven-point scale employed, which suggests that the overall strength of the stimuli factor could explain product innovation strategies of Greek listed firms.

5.10.2 Factor 2: Process Innovation (INNPC)

The second factor was characterised by four items each loading heavily onto a vector which exhibited an eigenvalue greater than one. These four variables were: investing heavily in cutting edge process technology-oriented R&D; developing radical new technology; creating innovative technologies and being the first company in the industry to introduce new technology. All these variables were found to reflect process innovation and have been collectively expressed as “*process innovation*”, “*radicalness of innovation*”, “*radicalness*” or “*radical product innovation*” (Huse, 1994, 2005; Kessler and Chakrabarti, 1999; Chandy and Tellis, 2000; Souder and Song, 1997). The label process innovation was considered as an acceptable descriptor for this factor.

5.10.3 Factor 3: Organisational Innovation (INNORG)

The third factor contained three variables with high loadings that naturally combined to represent organisational innovation. The variables were: supporting an organisational unit that drives innovation; encouraging innovation in the organisation and developing systems that encourage initiatives and creativity among employees. All these items clearly enhance the innovation strategies at organisational level. The same organisational innovation has

been acknowledged by Huse (1994, 2005). The mean score INNORG scale was 13.54 (SD= 4.22) which represented a high regard attached to organisational innovation strategies in considering innovation.

Table 5:8 b Principal Component Analysis for Innovation Indicators				
	Factor Loadings			Communality
	INNP	INNP	INNVORG	
	Product Innovation	Process Innovation	Organisational Innovation	
Increasing the Revenue from less than 3 Years Old New Products	.828	.170	.244	.774
Creating New Products for Fast Market Introduction	.813	.368	.236	.852
Creating New Variations to Existing Product Lines	.803	.326	.240	.809
Being the First Company in the Industry to Introduce new Products/Services	.785	.291	.224	.752
Being the First Company in the Industry to Introduce Technological Improvements	.633	.591	.325	.856
Investing Heavily in Cutting Edge Process Technology-Oriented R&D	.246	.863	.312	.904
Developing Radical New Technology	.264	.850	.300	.882
Creating Innovative Technologies	.457	.804	.235	.911
Being the First Company in the Industry to Introduce New Technology	.584	.665	.219	.832
Supporting an Organisational Unit that Drives Innovation	.245	.253	.899	.932
Encouraging Innovation in the Organisation	.238	.251	.893	.917
Developing Systems that Encourage Initiatives and Creativity among Employees	.290	.286	.827	.850
Eigenvalue	7.999	1.323	.949	
%variance explained (85.59)	66.659	11.028	7.912	

Note: Principal components analysis with varimax rotation, converging in 3 iterations

This section aimed to illustrate the results of data reduction techniques as they applied to empirical data generated from innovation measurements. Principal component analysis procedure resulted after specifying the number of factors in the outcome of a three factor solution and with an eigenvalue greater than one resulted to an outcome of two factors. Both resulted outcomes were coherent in structure and explained a high percentage of the variance without facing overleaping problems. The factors that have been derived are:

product innovation, process innovation and organisational innovation. Whereas, the factors that generated with eigenvalue greater than one were product-process innovation and organisational innovation. For both solutions the derived factors were accepted and used for reliability and validity analysis.

5.11 Principal Component Analysis of Organisational Performance Measures

The principal component analysis of the organisational performance is displayed in Table 5:9. The format of the table is common to all principal components analyses presented in this chapter and specifies the amount of variance explained by the solution, variable communalities, factor loadings and eigenvalue attributable to the extracted factor.

Table 5:9 Principal Component Analysis for Organisational Performance Indicators		
	Factor Loadings	Communality
	ORGPREF	
Performance Indicators	Organisational Performance	
Overall Firm Performance and Success	.929	.863
Our Competitive Position	.907	.824
After-Tax Return on Total Sales	.907	.822
After-Tax Return on Total Assets	.894	.800
Firm's Total Sales Growth	.762	.580
Eigenvalue	3.889	
%variance explained (77.78)	77.778	

Note: Principal Component Analysis with a single factor extracted

The configuration of the factor structure showed that a single factor was extracted which explained 78 percent of the total variance. A single factor was extracted in both cases when the eigenvalue is over one and when the numbers of factors are specified. Only one factor was extracted thus, rotation matrix was not possible and the convention of evaluating the extracted factor was undertaken. The solution was characterised by strong individual loadings on factor ranging from 0.76 to 0.92 indicating evidence of a robust structure. Pearson product-moment correlation was conducted, high correlations between the items of organisational performance were identified, showing that all items describe by one factor. In addition, the loadings of all five performance indicators onto a single factor seemed conceptually congruent on the basis of a deductive understanding of the organisational performance construct and previous performance measurements. Similarly, Li, Zhao, Tan and Liu (2008) identified a single factor that consists of three performance items: ROI, profits and market shares compared to close competitors with loadings of the factor ranging from 0.81 to 0.91 and Cronbach alpha 0.88. Also, Garcia-Morales, Llozéns-Montes and Verdú-Jover (2007) concluded that a single factor describes the financial indicators, namely: return on assets, return on equity, return on sales and main products and markets.

On the basis that the factor captured five different elements of performance and aligned itself with previous measures of the concept, it is believed that the derived solution was coherent in nature. As result, the solution was accepted and the factor labeled *organisational performance indicators* with the shorthand expression of ORGPEF ascribed to it.

5.12 Summary of Principal Component Analysis

The purpose of principal component analysis is to decompose the original data into a set of linear variates (Dunteman, 1989). Kim and Mueller (1978, p.14) described principal component analysis as “a method of transforming a given set of observed into another set of variables”.

Exploratory principal components analysis was performed primarily in order to pre-test the items and explore the underlying factor structure of the constructs of the study. Principal axis factoring in an exploratory factor analysis with a promax rotation was used taking into account some general requirements. Methodologists recommend a minimum sample size at least five to ten respondents per item (Comrey, 1988; Hair et al., 1998). Extraction method with eigenvalue greater than one and forced factors and a scree plot for the determination of factor extraction were used. Furthermore, items with loadings of greater than .40 were considered to be “*substantial*” (Floyd and Widaman, 1995) and loadings above .50 to be “*very significant*” (Hair et al., 1998).

The result of this analysis was the development of 15 factors with eigenvalue greater than one and 13 forced factors, details of which are summarised in Tables 5:10a and 5:10b.

All the factors presented in Table 5:10a and 5:10b satisfied the statistical and conceptual criteria for acceptance and inclusion in subsequent analysis in this study.

5.13 Construction of Scale Indices from the Extracted Factors

5.13.1 Scale Composition

After a thorough examination of extracted factors, indices had been constructed from each factor solution according to scale reliability and scale validity requirements (Miller, 1977; Kim and Mueller, 1978). “*Reliability and validity are tools of an essentially positivist epistemology.*” (Watling, as cited in Winter, 2000, p. 7). Crawford and Lomas (1980) argued that variables with loadings into factors with coefficients greater than 0.40 can be

used to construct scale indices. The Tables 5:11a and Table 5:11b provide the basis for scale reliability and validity.

Table 5:10a: Summary of Principal Component Analysis Factors Attributable to Each Construct (eigenvalue greater than one)		
Construct/Factor Label	Eigenvalue	Percentage of Variance Explained
External Corporate Environment		
ENV1:Dynamism in Marketing Practices	6.611	33.89
ENV2: Customer Dynamism	2.065	12.14
ENV3: Environmental Competitor's Dynamism	1.618	9.51
ENV4: Environmental Complexity-Munificence	1.258	7.40
Involvement in Strategic Decision-Making Process		
INVSDM1: Formation and Process of Strategic Decision Making	3.554	39.48
INVSDM2: Formation and Evaluation of Strategic Decision-Making	1.702	18.90
INVSDM3: Evaluation of Strategic Decision-Making	1.011	11.23
Strategic Decision-Making Process		
FINREP: Financial Reporting	2.933	58.65
RULEFORM: Rule Formalisation	3.808	76.16
HIERDECENT1:Hierarchical Decentralisation (Lower Level Management)	2.530	50.60
HIERDECENT2: Hierarchical Decentralisation (Upper Level Management)	1.160	23.19
LATCOM: Lateral Communication	2.474	61.86
Innovation		
INNV1: Product and Process Innovation	7.999	66.66
INNV2: Organisational Innovation	1.323	11.02
Organisational Performance		
ORGPREF: Organisational Performance	3.889	77.78

Table 5:10b: Summary of Principal Component Analysis Factors Attributable to Each Construct (specifying the number of factors)		
Construct/Factor Label	Eigenvalue	Percentage of Variance Explained
External Corporate Environment		
ENV1: Environmental Dynamism	5.677	40.54
ENV2: Environmental Munificence/Hostility	2.060	14.716
ENV3: Environment Complexity	1.252	8.944
Involvement in Strategic Decision-Making Process		
INVSDM1: Formation of Strategic Decision-Making	3.596	39.96
INVSDM2: Evaluation of Strategic Decision-Making	1.865	20.72
Strategic Decision-Making Process		
FINREP: Financial Reporting	2.933	58.65
RULEFORM: Rule Formalisation	3.808	76.16
HIERDECENT: Hierarchical Decentralisation	2.530	50.60
LATCOM: Lateral Communication	2.474	61.86
Innovation		
INNPDP: Product Innovation	7.999	66.65
INNVPC: Process Innovation	1.323	11.028
INNVORG: Organisational Innovation	.946	7.912
Organisational Performance		
ORGPREF: Organisational Performance	3.889	77.78

Table 5:11a Multi-item Scale Reliability and Validation Statistics											
Item-total Correlation											
Scale	Number of Scale Items	Cronbach Alpha	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
External Corporate Environment											
ENV1:Dynamism in Marketing Practices	5	.890	1	.548	.621	.689	.526				
ENV2: Customer Dynamism	3	.836	1	.785	.526						
ENV3:Environmental Competitor's Dynamism	4	.836	1	.550	.527	.526					
ENV4:Environmental Complexity-Munificence	5	.650	1	.346	.414	.256	.210				
Involvement in Strategic Decision-Making Process											
INVSDM1:Formation and Process of Strategic Decision Making	5	.565	1	.516	.734	.459	-.301				
INVSDM2:Formation and Evaluation of Strategic Decision-Making	6	.710	1	.474	.534	.317	.403	.234			
INVSDM3:Evaluation of Strategic Decision-Making	2	.423	1	.270							
Strategic Decision-Making Process											
FINREP: Financial Reporting	5	.818	1	.598	.399	.281	.394				
RULEFORM:Rule Formalisation	5	.921	1	.818	.628	.685	.665				
HIERDECENT1:Hierarchical Decentralisation(Lower Level Management)	3	.579	1	.340	.299						
HIERDECENT2: Hierarchical Decentralisation (Upper Level Management)	2	.810	1	.684							
LATCOM:Lateral Communication	4	.793	1	.553	.347	.442					
Innovation											
INNV1: Product and Process Innovation	9	.953	1	.789	.690	.639	.689	.718	.628	.517	.530
INNV2: Organisational Innovation	3	.938	1	.827	.799						
Organisational Performance											
ORGPREF: Organisational Performance	5	.924	1	.937	.491	.756	.725				

*Pearson Correlation Coefficients.

Table 5:11b Multi-item Scale Reliability and Validation Statistics										
Scale	Number of Scale Items	Cronbach Alpha	Item-total Correlation							
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
External Corporate Environment										
ENV1:Environmental Dynamism	8	.900	1	.842	.650	.575	.540	.606	.469	.528
ENV2:Environmental Munificence/Hostility	3	.571	1	.255	.240					
ENV3:Environment Complexity	3	.497	1	.441	.208					
Involvement in Strategic Decision-Making Process										
INVSDM1:Formation of Strategic Decision-Making	4	.799	1	.732	.473	.527				
INVSDM2: Evaluation of Strategic Decision-Making	5	.704	1	.534	.474	.317	.403			
Strategic Decision-Making Process										
FINREP: Financial Reporting	5	.818	1	.598	.399	.281	.394			
RULEFORM:Rule Formalisation	5	.921	1	.818	.628	.685	.665			
HIERDECENT1:Hierarchical Decentralisation	5	.706	1	.359	.302	.165	.117			
LATCOM:Lateral Communication	4	.793	1	.553	.347	.442				
Innovation										
INNPDP: Product Innovation	5	.936	1	.811	.711	.665	.742			
INNVPD: Process Innovation	4	.993	1	.834	.789	.832				
INNVORG: Organisational Innovation	3	.937	1	.827	.799					
Organisational Performance										
ORGPDP: Organisational Performance	5	.924	1	.937	.491	.756	.725			

*Pearson Correlation Coefficients.

5.13.2 Reliability of Scales Indices

Joppe (2000, p.1) defined reliability as: "...*The extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable*". Kirk and Miller (1986) identified the following three types of reliability regarding the quantitative research (1) the degree to which a measurement, given repeatedly, remains the same (2) the stability of a measurement over time and (3) the similarity of measurements within a given time period.

The Cronbach alpha coefficient was used to assess the reliability of the construct and to validate a questionnaire (Cronbach, 1951). Kline (1999) noted that acceptable value for Cronbach's alpha is between .7 and .9. Nunnally's (1967) argued that alpha coefficient of 0.50 or greater is adequate to conclude internal consistency. All scales were found to satisfy this reliability criterion with Cronbach alpha coefficients ranging from 0.42 to .95 (Tables 5:11a, 5:11b).

5.13.3 Validity of Scales Indices

The notion of validity is derived from the positivism which is defined by a systematic theory of validity. According to positivism, validity is the outcome and culmination of other empirical conceptions: universal laws, evidence, objectivity, truth, actuality, deduction, reason, fact and mathematical data to name just a few (Winter, 2000). Joppe (2000, p.1) argued that validity in quantitative research determines whether the research truly measures that which it was intended to measure or how truthful the research results are.

Wainer and Braun (1988) described the validity in quantitative research as "construct validity". The construct is the initial concept, notion, question or hypothesis that determines which data is to be gathered and how it is to be gathered. "*Construct validity concerns how well the measures employed fit the theories for which a test is designed*" (Scandura and Williams, 2000; p.1252). Validity is defined as the extent of a scale or a set of measures that accurately represent the concept of interest (Hair et al., 1998). Two techniques for testing construct validity are the confirmatory factor analysis (confirm a factor that represents a latent construct) and explanatory factor analysis (represents a discriminant and predictive validity). The validity can be tested by correlating the scale item with the scale itself. The Tables 5:11a, 5:11b demonstrate that the coefficients were relatively high and at the expected direction. The correlation coefficients were significant at 0.001 and the items were found to significantly contribute to the measurement of construct.

5.14 Concluding Remarks

The purpose of this chapter was to identify a series of variables with common characteristics among the measures of external environment, involvement in strategic decision-making process, characteristics of strategic decision-making process, innovation and financial performance. Two principal components analyses have been conducted; first, factors were extracted naturally according to the data set and second, factors were extracted as presented in the literature review. A summary of these factors derived from these constructs has been provided. The factors satisfied the statistical criteria of validity and reliability. The following chapter will proceed with hypotheses testing using both factors extracted.

CHAPTER 6

Correlation, Multiple Linear Regression Modelling and General Linear Model (GLM) Analyses

6.1 Introduction

Fifteen factors extracted from the principal components analysis with eigenvalue greater than one and 13 factors by specifying the number of factors as well as twenty items were analysed in terms of their correlations with the constructs of the study. This analytical technique was used as the basis of hypothesis testing in this study. There are categories of bivariate relationships: 144 bivariate relationships (factors were extracted with eigenvalue greater than one) and 120 bivariate relationships (forced factors were included in the study). These bivariate relationships are presented by means of the nature and magnitude of the correlation coefficients, and discussed in the light of the literature associated with the mainstream theories in corporate governance and upper echelons. These factors and non-factor variables were then taken, correlatively as well as separately since there are many dependent variables that have to be tested in regression analyses.

6.2 Preparation of Non-Factor Variables

While a total of fifteen factors with eigenvalue greater than one and thirteen forced factors were extracted from the principal component analysis, it was necessary to incorporate an additional seventeen variables in subsequent analytical tests. Twelve of these variables were single-item measures which could be used directly in further statistical analyses. These were described and annotated as follows: board size (BODSIZ), organisational size (ORGSIZ), interlocking directors (INTERDIR), executive directors (EXECDIR), non-executives directors (NONEXECDIR), inside directors (INSDIR), outside directors (OUTDIR), frequency of board meetings (FREQBODMEET), duration of board meetings (DURBODMEET), age of directors (AGED), educational level (EDUCLEVEL), educational specialty (EDUCSPEC), industry tenure (INDTEN), company tenure (COMPTEN), position tenure (POSTEN), functional background (FUNCBAC), female representation (FEMREPRES). There are seventeen non-factors variables overall, twelve single item variables were: board size, organisational size, age of directors, interlocking directors, executive directors, non-executive directors, inside directors, outside directors, industry tenure, company tenure, position tenure and female representation. However, there are five categorical variables that capture educational level, educational specialty, functional background, frequency of board meetings and length of board meetings. Table

6:1 summarises the sources of these non-factor variables and describes the specific notations to be used from this point in the thesis.

Table 6:1 Source of Non-factor Variables for Further Analysis	
Construct/Variable Label	Source Variable
<i>Board Composition Characteristics</i>	
BODSIZ: Board size	Single-item measure
INTERDIR: Inside directors	Single-item measure
OUTDIR: Outside directors	Single-item measure
INTERDIR: Interlocking directors	Single-item measure
FEMREPRES: Female representation	Single-item measure
EXECDIR: Executive directors	Single-item measure
NONEXECDIR: Non-executive directors	Single-item measure
<i>Board Demographic Characteristics</i>	
AGED: Age of Directors	Single-item measure
INDTEN: Industry tenure	Single-item measure
COMPTEN: Company tenure	Single-item measure
POSTEN: Position tenure	Single-item measure
EDUCLEVEL: Educational level	Categorical measures
EDUCSPEC: Educational specialty	Categorical measures
FUNCBAC: Functional Background	Categorical measures
<i>Organisational Characteristics</i>	
ORGSIZ: Organisational Size	Single-item measure
FREQBODMEET: Frequency of Board Meetings	Categorical measures
DURBODMEET: Duration of Board Meetings	Categorical measures

6.3 Product moment Correlation Analysis: Hypothesis Testing and Discussion of Findings

6.3.1 Correlation Analysis Results

A correlation analysis procedure was executed with the use of Pearson product-moment correlation coefficients. In Appendix E the results of product moment-correlation analyses are presented. In particular, Table 6:1a presents the correlation coefficients between the various environmental dimensions (factors that are extracted with eigenvalue greater than one), board size and the number of interlocking directors. Table 6:1a provides an insight into these bivariate relationships and it can be observed that of the seven variables, none showed to significant associations between environmental dimensions either with board size or the number of interlocking directorates.

Table 6:1b presents the correlation coefficients between various environmental dimensions (forced factors were extracted), board size and the number of interlocking directors. Table 6:1b demonstrates that none of the environmental dimensions had an association either

with board size or the number of interlocking directors. However, both Tables 6:1a and Tables 6:1b indicate a strong association between the environmental dimensions and the dual leadership structure.

Table 6:2 demonstrates the correlation coefficient between organisational size, board size, number of executive directors, number of non-executive directors and organisational performance. Table 6:2 provides an insight into these bivariate relationships and as it can be observed three out of four variables have an association with board size.

Table 6:3a shows the correlation coefficients between board size, inside directors, frequency of board meetings, length of board meetings, environmental dimensions (factors extracted with eigenvalue greater than one) and involvement in the strategic decision-making process (factors extracted with eigenvalue greater than one). In addition, Table 6:3a presents fifteen bivariate correlations; however, only two have a positive association with the involvement in the strategic decision-making process.

Table 6:3b indicates the correlation coefficients between board size, inside directors, frequency of board meetings, duration of board meetings, environmental dimensions (forced factors were extracted) and involvement in the strategic decision-making process (forced factors were extracted). This table concludes that four variables have a significant impact in the strategic decision-making process.

Tables 6:4a1- 6:4a5 present the correlation coefficients between educational level, educational specialty, functional background of board members, industry, company and position tenure of board members, environmental dimensions (factors extracted with eigenvalue greater than one) and the different aspects of the strategic decision-making process: rational/comprehensiveness, lateral communication, hierarchical decentralisation (two factors were extracted: lower and upper hierarchical decentralisation), rule formalisation and financial reporting. The results indicate that four variables have an effect on the different rational/comprehensiveness stages in the strategic decision-making process.

Regarding the financial reporting, only three variables have a substantial effect on this aspect of strategic decision-making process. Also, three variables have an association with the rule formalisation in the strategic decision-making process. Concerning hierarchical decentralisation, only one variable has a positive relationship mainly with the upper level

management of the hierarchical decentralisation. Finally, three variables have an explanatory effect on lateral communication.

Tables 6:4b1-6:4b5 present the correlation coefficients between educational level, educational specialty, functional background of board members, industry, company and position tenure of board members, environmental dimensions (forced factors were extracted) and the different aspects of the strategic decision-making process: rational/comprehensiveness, lateral communication, hierarchical decentralisation (forced factor was extracted), rule formalisation and financial reporting. The above Tables indicated that four variables have an association with the different forms of the rational or otherwise comprehensiveness in the strategic decision-making process, four variables have an explanatory impact on the financial reporting, only three variables have a significant effect on the rule formalisation, hierarchical decentralisation and on lateral communication respectively.

Table 6:5a demonstrates the correlation coefficients between outside directors, age of executives, female representation, industry, company, position tenure, educational level, educational specialty and innovation practices (factors were extracted with eigenvalue greater than one). In addition, Table 6:5a provides an insight into these bivariate relationships and it can be seen that of the eight variables only one was shown to have a significant association with product and process innovation practices, while of the eight variables just two have a significant effect on organisational innovation practices. The Table indicates that environmental factors have an impact on both product and process innovation practices as well as on organisational innovation.

Similarly, Table 6:5b presents the correlation coefficients between outside directors, age of executives, female representation, industry, company, position tenure, educational level, educational specialty and innovation practices (three forced factors namely; process, product and innovation practices). Table 6:5b provides an insight into these bivariate relationships and it can be seen that of the eight variables only one was shown to have a significant association with product as well as process innovation practices, while of the eight variables four variables including the external corporate environment have a significant relationship with organisational innovation practices.

Finally, Table 6:6a demonstrates the correlation coefficients between strategic decision-making processes, namely: financial reporting, rule formalisation, lower level hierarchical

decentralisation, upper level hierarchical decentralisation, lateral communication, product and process innovation as well as organisational innovation with respect to their influence on organisational performance (factors were extracted with eigenvalue greater than one). The results revealed an impact of financial reporting, rule formalisation and organisational innovation practices on organisational performance.

Similarly, Table 6:6b presents the correlation coefficients with forced factors and it shows that financial reporting, rule formalisation, hierarchical decentralisation and organisational innovation appear to have an effect on firm's performance

The following section will provide a brief analysis of the hypothesis testing as presented in Appendix E. The first hypothesis was related to various environmental dimensions and board composition characteristics. The hypotheses H1a, H1b, H1c and H1d revealed inconclusive results due to lack of statistical significance between the variables. More specifically, the various environmental dimensions have shown no impact on board composition either in terms of size or number of interlocking directors. However, it was found that dynamic environments favour the existence of dual leadership structure which is in accordance with the H1e hypothesis.

Regarding the hypotheses H2a, H2b, H2c and H2d, it was found that three of the four variables were positively associated with board size. The direction, magnitude and the level of significance of these correlation coefficients provide the basis for the evaluation of the hypothetical relationships. More specifically, board size exhibited positive associations with organisational size, the number of executives as well as non-executive directors; however, the board size did not have a substantial effect on the organisational performance. The results indicated that the hypotheses H2a, H4c and H4d were supported with significant positive correlations.

With regard to the hypotheses H3a, H3d and H3e that the board size, the duration of board meetings as well as the environmental munificence would be positively related to the involvement in the strategic making process, inconclusive results were found. Despite the fact that marginal positive relationships were found between inside representation (INTERDIR) and involvement in the strategic decision-making process as well as between the frequency of the board meetings (FREQBODMEET) and both formation and evaluation stage of the strategic decision-making process. Most of the correlations that

were significant were in the right direction, the hypotheses overall were not adequately supported because the correlation coefficients were not statistically significant.

Research propositions for the strategic decision-making process were outlined as comprising five elements of hypothesis four (H4). The first element was dedicated to a demographic characteristic of the executives: the educational level which suggested an association between this variable and the different forms of strategic decision-making process: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

The correlation coefficients contained in Tables 6:4a1- 6:4a5 as well the correlations that have been executed with forced factors presented in Tables 6:4b1,-6:4b5 were found to fall between +/-0.20. Therefore, generally weak correlations were found between the hypothesised variables influencing the different forms of strategic decision-making process namely; financial reporting, rule formalisation, hierarchical reporting and lateral communication. Nonetheless, it is worth mentioning that functional background and educational level and specialty of board members of the Greek listed organisations as well the environmental dynamism in marketing practices (ENV1) discovered that few significant correlations with the different forms of strategic decision-making process were evident. For the two forms of the strategic decision-making process: financial reporting and rule formalisation few significant correlations regarding the educational level, the functional background, the environmental dynamism in marketing practices and environmental complexity-munificence were evident. Regarding the hierarchical decentralisation and lateral communication in the strategic decision-making process, the correlation coefficients demonstrated that executives with lower educational background as well as companies operating in high dynamic and munificent environments are actively involved in the strategic decision-making process. Despite the fact that some marginal correlations were found between the variables and the following factors of strategic decision-making process: FINREP, RULEFORM, HIERCENT and LATCOM, most of the correlations were at the right directions but were not statistically significant at an acceptable level.

The hypothesis (H5) stated that board and demographic characteristics of the executives would be related to innovation practices. Partial evidence existed to support this contention in that few variables such as age, industry and educational level are related to

organisational innovation practices. The hypothesis with female directors and innovation practices was confirmed as there is no significant impact of the gender of board members and the extent to which they pursue innovative practices. However, external corporate environment is regarded as a catalyst factor for Greek executives to pursue innovative strategies. Finally, the hypothesis (H6) outlined that financial reporting; rule formalisation and organisational innovation have an effect on firm's performance.

6.4 Analysis of the Results

The next section contains results of the analysis used to test hypotheses proposed in earlier chapters. First, data were examined against the assumptions of the analyses used in the study. The next section details the linear regression analysis as well as the general linear model analysis that have been conducted in order to test the research hypotheses and provide a thorough understanding of the relationships examined. The research hypotheses will be tested by using two statistical approaches; linear regression as well as general linear model (GLM) with both factors with eigenvalues greater than one as well as specified the number of factors. Results from regression analysis are presented in Appendix F and from GLM analysis in Appendix G.

6.5 Multiple Regressions: Model Evaluation, Misspecification Tests and Multicollinearity Diagnosis

6.5.1 Introduction

Before analyzing the data, the data were first screened for problems that might affect later analyses and no problem was detected.

Regression models were evaluated according to four tests prescribed by econometricians (Gujarati, 1992; Greene, 1993) in order to predict the appropriateness of an equation. The diagnostic tests of linearity, homoscedasticity, normality and multicollinearity have been conducted in order to confirm that the regression analyses met the validity requirements.

6.5.2 Linearity

The linearity of a regression model is based on the association between dependent and independent variables which represent the extent to which a change of the dependent variable is associated with the independent variables (Hair, Anderson, Tatham and Black, 1992). Linearity can be easily examined through residual plots, however this is not considered a scientific approach. Other scholars have proposed different approaches to test the functional form of in multiple regressions such as Bartlett M specification error test

(Kendall and Stuart, 1961) and Box-Cox test (Box and Cox, 1964). For the purpose of the research, a more straightforward approach is applied; the Ramsey (1974) test which is conducted by calculating the predicted fitted values and the standardised residuals. The detection of linearity is examined by F-statistic and its associated significant level. F-statistic in most of the regression analyses was found to be low and no significant at 0.05 level. Therefore, a linearity test confirms the appropriateness of the regression model.

6.5.3 Homoscedasticity

The phenomenon of homoscedasticity occurs when the residuals in a regression specification have equal (homo) spread (scedasticity) or equal variance. The word derived from the Greek word skedanime, which means disperse (Gujarati, 1992). Whereas, any increase, decrease of the variance is described as heteroscedasticity, which causes problems for the statistical inference in regression models. There is an imperative need for the homoscedasticity assumption to be tested before accepting the results of a regression analysis. Several tests of detecting heteroscedasticity have been proposed by scholars (e.g. Glejser, 1969; Breusch and Pagan, 1979; Evans and King, 1988). In this instance, Goldfeld and Quandt (1965) test was applied. Goldfeld and Quandt (1965) suggested that F-test where:

$$F = \frac{n_2 RSS}{n_1 RSS}$$

The concept of this method is that the dataset is divided into two samples. More specifically, n_1 was composed of the residual sum of squares of the first data set and n_2 represent the residual sum of squares of the second sub-sample. The final step is to put the residual sum of squares into this equation in order to predict the F-value. Then, by checking against F-distribution tables it was possible to conclude that at the 0.05, the phenomenon of heteroscedasticity was not observed.

6.5.4 Normality

Another common violation in multiple linear regression modelling is that of normality (Hair et al, 1992). Normality can be detected by using histograms and scatter plots to test normal distribution. A supplementary test, numeric test for kurtosis and skewness were conducted. Hair et al. (1992) suggested the following equation in order to test normality:

$$Z = \frac{Skewness}{\sqrt{6/N}}$$

If kurtosis and skewness indices are not more than 1.0 unit away from 0 absolute value, normality is generally considered to exist (Huck and Cormier, 1996). Furthermore, based

upon the 0.05 level of statistical significance, the distribution tables suggested that the calculated z-statistic was below the critical value of 1.96 which shows that the residuals are normally distributed.

6.5.5 Multicollinearity

The phenomenon of multicollinearity exists when there is a strong correlation between two or more predictors in a regression model (Hair et al, 1992). The case of multicollinearity exists in multiple regression models when there is more than one predictor.

One of the common approaches to detect multicollinearity is to execute a correlation matrix of all predictors and identify if they are highly correlated (above .80 or .90) (Field, 2005). For the purpose of the study a more scientific approach has been implemented. Multicollinearity is detected by the variance inflation factor (VIF) scores and the tolerance values of the independent variables (Brown, 1991). An acceptable threshold level of a VIF is to be less than 10 and a tolerance value greater than 0.10 (Myers, 1990; Hair et al., 1992).

6.6 Environmental Dimensions and Board Composition Characteristics

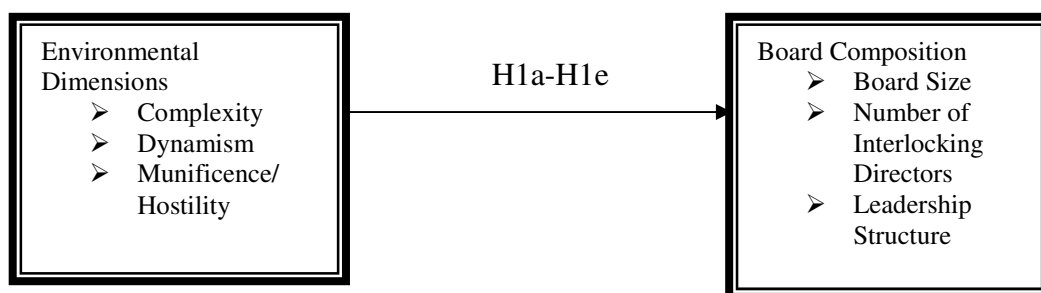
6.6.1 Introduction

Several studies in management literature have examined the alignment between person-environment fit (e.g. Pervin, 1968; Schneider, 1987). The purpose of these studies is based on the “elusive criterion of fit” (Judge and Ferris, 1992) and more specifically the fit between individuals and environment. The “fit” between strategy and its context either in terms of external environment (Anderson and Zeithaml, 1984; Bourgeois, 1980; Hitt, Ireland and Stadter, 1982) or organisational characteristics (Chandler, 1962) and executives’ characteristics (Gupta and Govindarajan, 1984) has a positive impact on the organisational performance. Organisational theorists argue that the effect of environment on organisational structure is critical for the organisational survival and prosperity, since executives act as a linkage between the organisation and the external environment (e.g. Hannan and Freeman, 1984; Katz and Kahn, 1978). Pfeffer and Salancik (1978, p. 225) claimed that “environmental contingencies affect the selection and removal of top organisational administrators to make the organisation more aligned with its environment”. Scholars (e.g. Lawrence and Lorch, 1967; Miller, Kets de Vries and Toulouse, 1982) outline the influence of external environment on the managerial characteristics. Gupta (1988) stated that the “fit” between leadership characteristics and environment enhance

managerial effectiveness. More specifically, he (1988, p. 164) claimed that “*an organisation’s environmental context has the potential to exert a direct contingency impact on the composition and characteristics of executive leadership.*”

Figure 6:1 presents the first set of hypothesised relationships between the environmental dimensions and the board composition characteristics.

Figure 6:1 Hypothesised Research Model between Environmental Conditions and Board Structure



H1a: The more complex the environment, the larger the size of the board and the higher the number of interlocking directorates.

Hypothesis H1a proposed that firms operating in complex environments tend to have a large board size and a high number of interlocking directors; however Tables 6:7, 6:9; 6:11, 6:13 illustrate that the results of regression analysis were in the same line with the outcomes of the GLM analysis (Tables 6:73, 6:74, 6:75, 6:76) neither of which indicate any statistical significance of environmental circumstances towards the composition of Greek boardroom. Therefore, the results do not offer support to H1a hypothesis.

Few studies have systematically examined the effect of environmental dimensions on the composition of Boards of Directors. Dess and Beard (1984) have developed a model of several environmental dimensions such as resource scarcity, volatility and complexity and how they affect the board size and the number of interlocking directors. A few studies, so far, have examined the role of environment on board composition and on organisational performance. Pfeffer and Salancik (1978) found a strong association between the proportion of interlocking directorates and environmental uncertainty due to competition. In addition, Pfeffer (1972) reported that the proportion of outside directors was positively related with environmental demands. Other studies attempted to investigate the impact of specific environmental dimensions on board composition. Scholars argued that firms operating in complex environments require a more diversified top management team in

order to monitor the environmental diversity (Gupta, 1988, p. 160). Firms in complex environments face problem-solving situations and, thus, require larger and heterogeneous boards (Janis, 1972). However, Boyd (1990) reported no impact of environmental complexity to board size and number of interlocking directorates in high performing firms. Pfeffer (1973) conducted a systematic examination of the composition of hospitals' Boards of Directors according to the changes in the environmental contingencies. He revealed that the structures as well as the attributes of board members are associated with the external environment. In particular, executives that come from several functional backgrounds might bring expertise and knowledge to the board (Pfeffer and Salancik, 1974). In a similar study of 290 California hospitals, Boeker and Goodstein (1991) concluded that organisations, in an attempt to copy with environmental threat and uncertainty are required to modify the composition of Boards of Directors. However, the empirical findings suggest that Greek boards operating in complex environments are not changing their composition with respect to size and number of interlocking directorates according to environmental contingencies. Because the undertaken study is cross-sectional, the empirical results might be able to predict the effect of environmental changes on the board composition.

H1b: The more unstable the environment the larger the size of the board.

Hypothesis H1b suggests that unstable or otherwise dynamic environments which are comprised in factors ENV1, ENV2 and ENV3 and ENV1 for forced factors require a large board size. The statistical outcomes derived from regression analysis presented in Tables 6:7 ($t=0.660$, $t=-1.762$, $t=-1.094$, $p<0.05$) and Table 6:11 respectively ($t=-0.467$, $p<0.05$) show no moderating effect of environmental dimensions of board size. Similarly the results from GLM analysis illustrated in Tables 6:73 and 6:74 certainly do not refute the hypothesised relationship between board size and environmental dimensions at 0.05 levels.

Unstable environments are associated with unpredictability and rapid changes for both individuals and organisations (Duncan, 1972; Dess and Beard, 1984) as well as with limited availability of information for decision-making (Simon, 1955). Therefore, decision-makers experience high levels of stress and anxiety (Waldman et al., 2001), which can be partially sorted by assigning large Top Management Teams and delegating duties to them (Hambrick and Mason, 1984; Pearce, 2004). Galbraith (1973, p. 4) stated that within unstable environments, there is a great need for information that has to be preceded by decision-makers. The greater information-processing requires greater heterogeneity and

board size (Haleblian and Finkelstein, 1993). In similar studies, it was found that high performing firms, in order to copy with environmental demands, prefer to have a small board size and high number of interlocking executives (Boyd, 1990). Nevertheless, the research findings did not support statistically any moderating effect of unstable environment to the board composition.

H1c: The more munificent the environment the larger the size of the board.

Hypothesis H1c predicts an effect of munificent environment to the board size. The factor (ENV4) and (ENV2, forced factor) includes elements related to environmental munificence. The regression results of ENV4 presented in Table 6:7 ($t= 0.514$, $p<0.05$) and of ENV2 in Table 6:11 ($t= -1.315$, $p<0.05$) revealed inconclusive findings towards the hypothesised relationship. The results that derived from the GLM analysis presented in Tables 6:73 (sig. =.609, $p<0.05$) and Tables 6:74 (sig. =.379, $p<0.05$) confirm the results of regression analysis. The results are opposed to the suggested hypothesis.

Concerning munificent environments, organisations have insufficient resources; therefore, they tend to hire more staff than is required especially at executive level (Williamson, 1963). Scholars have found a direct effect of munificent environment to board size (Keats and Hitt, 1988; Bantel and Finkelstein, 1995). Nevertheless, Boyd (1990) found that munificent environment has opposite effects on board size and interlocks. As resource becomes more limited, the number of interlocks increases while board size declines. On the contrary, this study did not provide any strong relationship between munificent environment and board size.

H1d: Munificent environment is negatively related to both board size and the number of interlocking directorates

Hypothesis H1d is a more detailed examination of the previous research hypotheses; it suggests that firms operating in munificent environments require a small board size and few interlocking directorates. The elements of munificent environments are included in the factor ENV4 and in the forced factor ENV2. Linear regression analysis is conducted in order to test the suggested hypothesis. The results from regression analyses presented in Tables 6:7 ($t= 0.514$, $p<0.05$), 6:9 ($t= -0.481$, $p<0.05$); 6:11 ($t=-1.315$, $p<0.05$), 6:13 ($t=0.417$, $p<0.05$) as well as GLM analysis (Tables 6:73; 6:74; 6:77; 6:78) suggested no statistical significant association between munificent environments, board size and number

of interlocking directors. However, the beta coefficient for the interaction effect between ENV4 and interlocking directors and between forced ENV2 and board size was negative as predicted by the research hypothesis.

Goodstein and Boeker (1991) contended that board composition and its control encourage executives to pursue specific strategies. As the board participates in the strategic decision-making process (Tushman and Romanelli, 1985), any environmental change leading to a corporate strategy change might consequently require board composition change. As resource dependency theory proposes Boards of Directors act as a linkage between the firms and the external environment and are supposed to manage external dependencies (Pfeffer and Salancik, 1978) and reduce environmental uncertainty (Pfeffer, 1972). Environmental changes have been associated with alternation in the firm's corporate strategy. Since, boards are "vehicles for co-opting important external organisations" (Pfeffer and Salancik, 1978, p. 167); they are required to initiate strategic changes in order to cope with environmental demands. Strategic changes are related to any board composition change which might facilitate a corporate strategy change mainly during environmental munificence. Lang and Lockhart (1990) argued that any environmental change will affect the number of interlocking directors. Based on a sample of U.S airline firms, Hillman, Cannella and Paetzold (2000) suggested that as environments change, board composition is required to change in order for the board members to be able to reflect the environmental demands. The results of previous studies are not in line with the results of this study that suggest the environmental munificence has no effect on board size and on the number of interlocking directors.

H1e: Dynamic environments favour the dual leadership structure.

Hypothesis H1e suggests that companies operating in dynamic environments tend to prefer the dual leadership structure. ENV1, ENV2 and ENV3 as well in the forced factor ENV1 concerns elements related to marketing practices, customers and competitors. Results that have been derived from linear regression analysis presented in Tables 6:15 ($t=2.271$, $p<0.5$) and Table 6:17 ($t= 2.343$, $p<0.05$) confirmed the hypothesised relationship. Similarly, the results from GLM analysis illustrated in Tables 6:77 (ENNV1: dynamism in marketing practices $\text{sig}= .026$, $p<0.05$; as well as in Table 6:78 (ENV1: environmental dynamism $\text{sig}=.022$, $p<0.05$). The results from both statistical approaches indicate a robust association between environmental dynamism and the choice of the same person to hold the position of CEO and Chairman in the Greek listed firms.

Dynamic environments are associated with unpredictability and rapid change which companies and individuals have to cope with (Duncan, 1972). Firms operating in dynamic environments tend to have an internal locus of control (Miller, Kets de Vries and Toulouse, 1982). Therefore, they recommended that companies operating in such environments have to be managed by internal executives. Internal managers rely more on their abilities to guide the organisation. Li and Simerly (1998) found that insider ownership is associated with higher returns under conditions of environmental dynamism, compared to outsiders who are not able to evaluate alternative strategies under conditions of dynamic environments.

Organisational theory suggests that it is necessary for a decision maker to have a clear and unambiguous authority over subordinates, which is derived from a unity of command (Massie, 1965 cited in Finkelstein and D'Aveni, 1994). CEO duality helps to avoid confusion among managers as to who is the boss and facilitates the decision-making by establishing clear responsibilities and authorities. Organisational theory, also, supports the idea that firms that are headed by strong leaders who have a strategic direction are able to adapt environmental demands (Mintzberg and Waters, 1982). In addition, the leadership perspective suggests that firm will perform better if one person holds both titles, because the executive will have more power to make critical decisions (Harris and Helfat, 1998). Furthermore, stewardship theory proposes that CEO duality would facilitate effective action by the CEO and consequently improve the organisational performance under specific circumstances (Boyd, 1995). Pfeffer and Salancik (1978) argued that a single leader can respond to external events and facilitate the decision-making process. The existence of a single leader during periods of high environmental turbulence facilitates a more unified corporate response to events and limits potential agency cost. Boyd (1995) hypothesized a positive association between CEO duality and organisational performance under environmental dynamism based on a sample of 192 firms from 12 economic sectors.

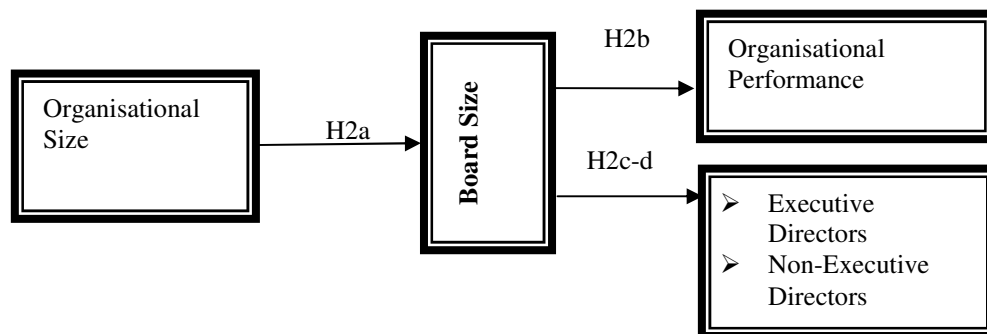
However, this hypotheses relationship was not supported. Virany et al., (1992) mentioned that the combination of CEO succession and top team change could enable the senior management to be proactive in their decisions during turbulent environments. Ensley, Pearce and Hmieleski (2006) found that the need of a transformational leader is imperative in dynamic environments. The results of this study indicate a positive relationship between CEO duality and environmental dynamism, which might have positive effect for the company under conditions of resource scarcity or high complexity.

6.7 Board Size and Board Composition Characteristics and Organisational Performance

6.7.1 Introduction

Organisations adopt certain structures in order to control and coordinate the members' activities (Coleman, 1990; Mintzberg, 1983; Pugh et al., 1963). Demographic theory focuses on compositional characteristics that influence interpersonal and group dynamics and how they influence the firm's performance (Kakabadse, 1991; Kakabadse and Myers, 1996). Few studies have examined the organisational characteristics such as size and composition and even fewer the governance mechanism of the firm (Carroll, 1984). The current study, aims to explore the internal structures and how they affect the board composition in a study of Greek listed organisations in the Athens Stock Exchange. Figure 6:2 presents the associated factors between the organisational and composition characteristics.

Figure 6:2 Hypothesised Research Model between Organisational Structure and Board Structure



H2a: The larger the firm's size, the larger the board size

Hypothesis H2a suggests a positive relationship between organisational size (in terms of number of employees) and board size. The results of both statistical analyses confirm the association as it can be seen in Table 6:19 ($t=3.524$, $p<0.05$) and in Table 6:79 ($\text{sig}=.001$, $p<0.05$) where was found the organisational size to be significantly related to board size.

The firm size represents the number of organisational members (usually employees) (Glisson and Martin, 1980) and reflects the resources available to the organisation (Weiner and Mahoney, 1981). Corporate size contributes to the economic activities that the firm can engage in and the amount of resources that the firm possesses. Many studies provide

empirical evidence for the association regarding size and structure relationship (Pugh, Hickson, Hinings and Turner, 1969; Hickson, Pugh and Pheysey, 1969). In particular, scholars have reported a curvilinear relationship between organisational size and organisational structure (Child, 1972; Mileti, Gillespie and Haas, 1977). Other authors (e.g. Dalton et al., 1998; Pugh et al., 1963; Aldrich, 1972; Thompson, 1967) have associated firm's size with corporate performance as well as with board size (Dalton et al., 1999; Yermack, 1996). Agency theorists argue that larger organisations require a greater number of directors in order to monitor and control firm's activities (Kiel and Nicholson, 2003).

On the contrary, resource dependency theorists suggest that the need for environmental linkage increases as a direct function of firm size increases (Allen, 1974; Dooley, 1969; Pfeffer, 1972; Warner and Unwalla, 1967). Large organisations require access to a greater amount of resources; therefore they are likely to appoint more executives that will provide access to those resources (Kiel and Nicholson, 2003). Scholars state that executives act as an adaptive process to the external environment, since they reduce conflict and provide a link to external information, which helps organisations to comply with environmental demands (Helmich, 1980; Pfeffer and Salancik, 1977; Virany, Tushman and Romanelli, 1992). Empirical findings in small-medium firms have shown that companies with small firm size (approximately 30 employees) have boards that are composed by single-owner managers or a small team compared to large firms (approximately 100 employees) that employ large boards (Bennett and Robson, 2004). Similar findings have been derived from 105 Greek listed organisations where a positive association was found between organisational size in terms of number of employees and board size.

Greek organisations consist mainly of SMEs that lack professional management (Georgas, 1993). However, most Greek organisations are changing their management practices toward a more communication-intensive and team-based decision-making style. Greek firms appeared to recognize the importance of talented human capital and they have gradually increased the middle-line management positions in an attempt to restructure their firms and to compete with the EMU requirements (Spanos, Prastacos and Papadakis, 2001).

H2b: The larger the board size the better the organisational performance

Hypothesis H2b suggests an association between the board size and the firm's performance, however, the results at that instance revealed no association between the

variables as the Tables 6:21 ($t=1.825$, $p<0.05$) and Table 6:80 (sig. 072, $p<0.05$) indicate. Therefore, the suggested hypothesis cannot be supported.

Recent reviews on boards have been dominated by a tradition in which board composition is related to corporate financial performance (Johnson et al., 1996; Pettigrew, 1992; Zahra and Pearce, 1989) and mainstream research has been heavily influenced by a research tradition from financial economics and theories treating the board as a so-called “black box” (Daily et al., 2003; Finkelstein and Mooney, 2003).

Proponents of agency theory provide evidence that a smaller board is associated with better performance due to coordination and free rider problems that large boards are related to (Gertner and Kaplan, 1996). However, other management studies found that larger boards contribute to organisational performance (e.g. Yermack, 1996; Eisenberg et al., 1998; Jensen, 1993). These studies are consistent with resource dependency theory which suggests that larger boards are associated with higher levels of firm’s performance (e.g. Boyd, 1990; Alexander, Fennell and Halpern, 1993; Chaganti, Mahajan and Sharma, 1985; Mintzberg, 1983) due to the fact that larger boards have greater access to resources (Pfeffer, 1973). Haleblian and Finkelstein (1993) argue that large boards have more problem-solving skills. However, large groups may be less cohesive (Lipton and Lorsch, 1992) and more difficult to coordinate due to potential interactions among group members (O’Reilly, Caldwell and Barnett, 1989). Largeness can inhibit the board’s ability to initiate strategic actions (Goodstein, Gauten and Boeker, 1994). It has been argued that a smaller board increases participation and social cohesion (Muth and Donaldson, 1998) that might contribute to organisational performance (Evans and Dion, 1991; Yermack, 1996).

Furthermore, empirical studies that have been conducted in various cultural contexts did not provide any support for the hypothesised relationship between board size and company’s performance (e.g. Holthausen and Larcker, 1993; Wan and Ong, 2005; Rose, 2005). Results that derived from Greek listed organisations are in line with these studies, since it was found that the size of Greek boardrooms has no effect on the firm’s performance. After extensive research on board of directors, Pettigrew (1992, p. 171) concluded that “Great inferential leaps are made from input variables such as board composition to output variables such as board performance with no direct evidence on the processes and mechanisms which presumably link the inputs to the outputs”.

H2c: The larger the board size, the higher the number of executive BOD

Hypothesis H2c proposes an effect of board size to the number of executive boards members. The research outcomes confirm a positive relationship between board size and the number of executive directors. The results as illustrated in Tables 6:23 ($t=4.494$, $p<0.05$) and in 6:81 (sig. 000, $p<0.05$) indicate a positive and significant association between the two variables.

Executive directors are regarded as full time employees that are responsible for the organisational strategic and operational aspects (Weir, 1997). Executive directors are characterised as “rubber stamp” for management initiates or “as tools” of management (Pfeffer, 1972, p. 219). The proportion of executive directors is related to the board size. Several studies provide evidence for the association regarding size and structure relationship (e.g Pugh, Hickson, Hinings and Turner, 1969; Hickson, Pugh and Pheysey, 1969; Child, 1972). As organisational size with respect to the number of employees increases, the board size increases and also, affects the proportion of executives in the boardroom. In the Greek boardrooms, a strong association was found between the board size and the number of executives. The results have shown that the board size of Greek organisations affects the proportion of executive directors. Results indicate a balance in the proportion of executive versus non-executive directors in the Greek boardrooms of quoted in the ASE firms.

H2d: The higher the board size, the higher the number of non-executive BOD

Hypothesis H2d puts forward a relationship between board size and the number of non-executive board members. The results that have derived support an evident association between the board size and the number of non-executive Greek directors as can be seen in Tables 6:25 ($t=7.853$, $p<0.05$) and Table 6:82 (sig.000, $p<0.05$).

Non-executive directors are employed as part-timers in order to bring experience and expertise to the organisation and to protect shareholders’ interests (Weir, 1997). Regulatory corporate governance reforms (e.g. Cadbury, 1992; Hampel, 1998) focus on the control task and encourage companies to appoint an increased number of non-executive and independent directors in order to comply with sound corporate governance codes and enhance the trust of shareholders. Empirical studies have revealed that two tier of board members are non-executives (McMichael, 1976; Hunt, 1984; Logan and Dunstan, 1993). Clifford and Evans (1997) argue that larger companies appoint a larger board size and

consequently, they have a greater representation of non-executive directors. In a sample of IPO firms in London Stock Exchange, Filatotchev (2005) reported that the average board size was 5.8 and the number of non-executive directors 2.5 respectively.

Other studies that have been conducted in larger and more mature organisations indicated a higher representation of non-executive directors (O'Sullivan, 2000; Shivdasani and Yermack, 1999). Similarly, Westhead (1999) concluded that large organisations employ more non-executive directors compared to those of limited ownership. O'Sullivan (2000) argued that as organisational size increases, the proportion of non-executives is increasing. Non-executive directors act as effective monitors of executive directors and they have a positive effect on the firm's performance (Vance, 1964; Ezzamel and Watson, 1993; Pearce and Zahra, 1992). In the contrast, there are studies that revealed a negative effect of non-executive directors on the organisational performance (Yermack, 1996; Bhagat and Black, 1999; Hermalin and Weisback, 1991).

This research work concluded that there is a significant and positive relationship between the board size and the proportion of non-executive directors in a sample of 105 Greek quoted organisations. As previous studies have indicated the organisational size is related to the board size and consequently, affects the appointment of non-executive directors.

6.8 Involvement in the Strategic Decision-Making Process

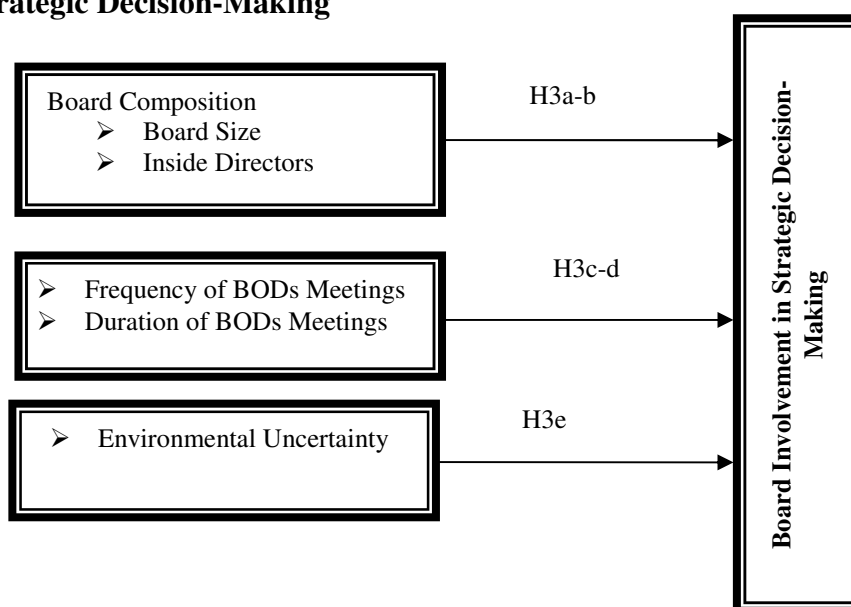
6.8.1 Introduction

In the strategic management literature, involvement in the strategic decision-making process is based on two theoretical approaches: strategic choice and the agency theory (Rindova, 1999).

Strategic choice perspective emphasises the capacity of board members towards the development and refinement of strategic decisions (e.g. Carpenter and Westphal, 2001; Tashakori and Boulton, 1983). On the contrary, agency perspective monitors managers and they pursue corporate strategies in the shareholders' interests (e.g. Baysigner and Hoskisson, 1990; Boeker and Goodstein, 1993). In this study, contingency perspective was adopted with regard to board roles as well as composition and how they influence the strategic decision-making process.

The following hypotheses presented in Figure 6:3 have been developed in order to examine the factors that influence board involvement in the strategic decision-making process. Three factors have been extracted with eigenvalue greater than one namely INVSDM1: formation and process of strategic decision-making process, INVSDM2: formation and evaluation of strategic decision-making process and INVSDM3: evaluation of strategic decision-making process and two forced factors: INVSDM1: formation of strategic decision-making process and INVSDM2: evaluation of strategic decision-making process.

Figure 6:3 Hypothesised Research Model of the Factors Affecting Board Involvement in Strategic Decision-Making



H3a: Board size is negatively related to board involvement in the strategic decision-making process

Hypothesis H3a proposed a negative association between board size and the different forms of strategic decision-making processes. This hypothesis has been investigated with linear regression model and GLM. The results that derived from regression analyses concluded with insignificant findings as Tables 6:27 ($t=-1.218$, $p<0.5$), 6:29 ($t=1.420$, $p<0.05$), 6:31 ($t=1.148$, $p<0.05$), 6:33 ($t=-0.053$, $p<0.05$) and 6:35 ($t=1.711$, $p<0.05$) indicate. However, the beta coefficient for the interaction effect between board size and involvement in the strategic decision-making process in some instances was found to be negative as predicted by the research hypothesis.

While regression analyses concluded to insignificant findings, GLM findings support the association between board size and the forced factor of evaluation of strategic decision-making process as Table 6:87 illustrates.

Scholars have associated board size with level of involvement in the strategic decision-making process (Finkelstein and Mooney, 2003). From the resource dependency theory perspective, a large board can be beneficial for the organisation (Judge and Zeithaml, 1992). Large boards consist of a greater number of directors that have great expertise and knowledge that they can bring to the organisation (Pfeffer and Salancik, 1978). Larger boards have the ability to cope with environmental uncertainty and to form links with business partners (Pfeffer and Salancik, 1978, p. 172) and to deal with higher information-processing demands. Board size is related to organisational size, diversification and internationalisation strategies of the firm (Pearce and Zahra, 1998; Sanders and Carpenter, 1998), indicated that a larger board is more likely to have a significant contribution to the firm's strategy.

However, a high number of board members could be ineffective in the strategic decision-making process due to coordination difficulties (Cohen and Bailey, 1997). In addition, larger boards are slower and less cohesive in the strategic decision-making process (Mueller and Baker, 1997; Reed, 1978). Herman (1981) concluded that large boards cannot manage to pursue effective decisions. Scholars (e.g. Judge and Zeithaml, 1992; Goodstein et al., 1994; Ruigrok et al., 2006) have reported a negative effect of board size towards the involvement in the strategic decision-making process. The research findings seem to be consistent with other scholars, since a negative association between board size and board members participation in the strategic decision-making process was found.

H3b: Inside representation is positively related to board involvement in the strategic decision-making process.

Similarly to the previous hypothesis, this hypothesis examines the impact of another board composition characteristic; the insider/internal directors to the involvement in the strategic decision-making process. The results that derived with linear regression did not support the hypothesis developed but also the beta coefficient suggests a negative relationship between the variables as it can be seen in Tables 6:27 ($t=1.280$, $p<0.05$), 6:29 ($t=0.092$, $p<0.05$), 6:31 ($t=-1.832$, $p<0.05$), 6:33 ($t=0.884$, $p<0.05$) and 6:35 ($t=-1.423$, $p<0.05$). However, GLM analysis revealed a significant association between internal directors and board

involvement in the evaluation process of strategic decision-making as indicated in Table 6:85.

Proponents of strategic choice report that inside directors provide valuable insights and information to boardroom since they initiate discussions and are actively involved in the strategic decision-making process (Baysigner and Hoskisson, 1990). Previous studies indicate inside directors with company and industry experience and knowledge play an important role in the strategic decision-making process (Goodstein and Boeker, 1991; Johnson et al., 1993; Judge and Zeithaml, 1992). Ford (1988) found that inside directors are associated with board involvement in the strategic decision-making process. Similarly, Tashakori and Boulton (1983) concluded that insiders were related to greater participation in the strategic planning process. However, in a sample of Swiss companies, Ruigrok et al. (2006) examined how board characteristics affect involvement in the strategic decision-making process but without providing any evidence of insider or outsider board representation to their involvement in the strategic decision-making process. Empirical results that derived from the GLM seem to be on the same lines with previous studies in the field providing a strong association between inside representation and the level of board participation in the strategic decision-making process of Greek listed organisation in the ASE.

H3c: The higher the frequency of board meetings, the higher the board's strategic involvement will be.

Hypothesis H3c indicates a positive relationship between the frequency of the board meetings and the involvement of board members in the strategic decision-making process. Regression analysis findings concluded with controversial findings between frequency of board meetings and board involvement as indicated in Tables 6:27, 6:29, 6:31 and 6:33. However, it is interesting to report that two specific frequencies of the board meeting (once a year and quarterly) were found to have a significant but negative effect on the various stages of board involvement. The results that derived from GLM analysis provide a straight forward support to our research hypothesis as it can be seen in Tables 6:83, 6:86 which shows that frequent board meetings increase the board involvement in the formation process of strategic decision making.

Weick (1995) highlighted the importance of participation by encouraging the use of meetings as a sense-making mechanism. Organisations operating in complex and uncertain environments are likely to become successful if they implement multiple approaches for decision-making, multiple sensors and information processors are part of strategic decision-making approach. Board meetings is the number of general meetings that each board has every year and is regarded a proxy for board activism (Vafeas, 1999). The board meetings enable the board to act as a governing body and their directors have the opportunity to meet and discuss the main issues of the research agenda and propose solutions to the problems that the organisation is facing (Huse, Postma, Ruess and Zattoni, 2006). The board meetings allow to the Boards of Directors to perform their roles; namely control, strategy and service (Zahra and Pearce, 1989). The board meetings have been associated with the board involvement in strategic decision-making process. In particular, the frequency of the board meetings is related to the involvement in organisational strategic decisions. In an empirical study that has been conducted in small Norwegian firms, Huse et al. (2006) concluded that the higher the frequency of the board meetings, the higher the board strategic involvement. Similarly, Buchholtz et al. (2005) found a positive relationship between team power as a moderator of the relationship between board involvement and affective conflict. In our study, the relationship between the frequency of the board meetings and the level of involvement has been partially confirmed. The frequent Greek board meetings increase the level of involvement in the formation process of strategic decision making.

H3d: The longer the board meetings, the higher the board's strategic involvement will be.

Hypothesis H3d advocates an association between the duration of board meetings and the extent of board members' involvement in strategic decision-making process. The results from the regression analysis suggest a strong and positive relationship between duration of board meeting and board involvement. In particular, board meetings that last more than two hours, two hours, one and half hour or even an hour have an effect on board involvement with respect to board involvement in INVSDM2: formation and evaluation of strategic decision and on the forced factors INVSDM1: evaluation of strategic decision-making and on INVSDM2: evaluation of strategic decision-making process.

The significant results from regression analyses can be found in Tables 6:29, 6:31 and 6:33. The findings that were drawn from the GLM indicate that a strong relationship between duration of board meetings and the board members' evaluation phase in strategic

decision-making process as can be seen in Tables 6:85 and 6:87. The results from both statistical approaches provide full support of the research hypothesis.

Apart from the frequency of the board meetings, another criterion of board participation is the duration of board meetings. According to recent regulatory reforms regarding the board composition, the majority of board members are outsiders or non-executives, these executives devote limited time to the firm (Huse, Postma, Ruess and Zattoni, 2006). Therefore, if the agenda of board meetings includes topics such as strategic choices, strategic context or strategy formulation, then the board meetings should last at least quite a long time (Stiles, 2001). Although, the duration of board meetings does not assure board effectiveness, longer board meetings allow to the board members to focus more on the evaluation of strategic alternatives and provide a better judgment regarding the organisational strategic choices and decisions (Huse, Postma, Ruess and Zattoni, 2006). Similar to the findings from Norwegian small sized companies (Huse et al., 2006); Greek Boards of Directors are more actively involved in strategic decisions after attending long board meetings.

H3e: The more uncertain the environment, the more involved the board will be in the strategic decision-making process

The final hypothesis regarding the explanatory effect of environmental munificence or otherwise called hostile towards the board the board involvement in the several stages of strategic decision making processes concluded with insignificant results both with regression as well as with GLM analysis as Tables 6:27, 6:29, 6:31, 6:33, 6:35, 6:83,6:84, 6:85, 6:86 and 6:87 indicate.

Uncertainty is defined as “an individual’s inability to predict something accurately” (Milliken, 1987, p. 136). Response uncertainty represents managers’ inability to evaluate the impact of potential approaches that firms could adopt. Response uncertainty is most relevant when the management of a firm perceives “a need to act because of a pending event or change is perceived to pose a threat or to provide some unique opportunity to the organisation” (Milliken, 1987, p. 137). Uncertainty is described as a doubt about future events or cause and effect relationships regarding the environment (DiFonzo and Bordia, 1998). Environmental uncertainty can be managed through information seeking in interpersonal (Berger and Bradac, 1982) and organisational contexts (Ashford and Black,

1996; Kramer, 1999; Morrison, 2002). Participation is a process in which decision-making is shared between superiors and subordinates (Sagie, Elizur and Koslowsky, 1995). The strategic decision-making process requires high levels of social interaction and linkage to social complex resources (Barney, 1995). Participation in strategic decision-making increases the exchange of information (Ashmos, Duchon and McDaniel, 1998). Organisations operating in uncertain environments are required to have organisational flexibility and high levels of participation in strategic decision-making (Ashmos, Duchon and McDaniel, 1998). A volatile world requires more sensors, faster processing information and action taking (Peters, 1988, p.109). Organisations can achieve a competitive advantage through people because people participate in decisions and people share information with organisations (Pfeffer, 1994). In addition, Barney (1995) argues for “social complex resources” such as teamwork and cooperation as key elements for the organisation competitive advantage. Wheatley (1992) underlines that involvement in the strategic decision-making process acts as a response to various ambiguous and unpredictable environments.

Weick (1995) argued that participation facilitates process of organisations to cope with uncertainty. Participation acts as a managerial response to strategic issues and increases the comprehensiveness of analytical activities in organisations (Topping and Hernandez, 1991). Participation in strategic decision making can reduce the levels of uncertainty (Bordia, Jones, Gallois and Callan, 2004). Macy, Peterson and Norton (1989) concluded that individuals that have participated in strategic decision-making claimed that there is a clarity in the criteria and the procedures of strategic decisions. Clemens et al. (2007) provided empirical evidence that there is a positive relationship between the level of uncertainty and the level of strategic response.

In environmental circumstances where the future of the organisations is unpredictable, the companies have to adjust their internal processes. Research findings have shown that organisations become more active as the level of uncertainty increases (Ansoff and McDonnell, 1990; Parnell et al., 1992). Carpenter and Westphal (2001) found that Boards of Directors are positively associated with involvement in implementation and negative advice on new strategic alternatives in turbulent environments. On the contrary, Bordia, Jones, Gallois and Callan (2004) found that participation in strategic decision-making is not influenced by the environmental uncertainty. The research findings are consistent with

the lateral findings where it was found that environmental uncertainty is not explanatory factor to the board involvement in the strategic decision-making process in Greek firms.

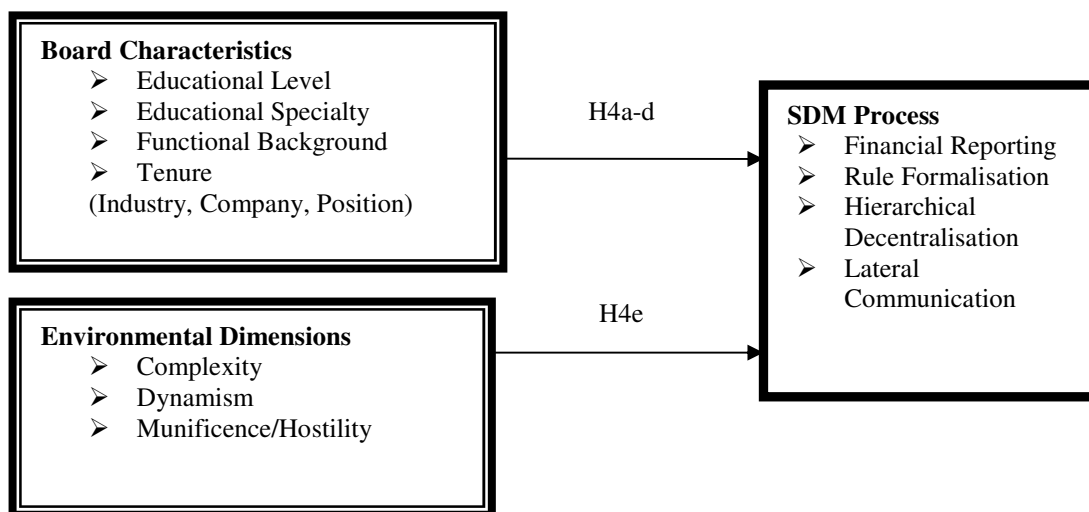
6.9 Board Demographic Characteristics, Environmental Circumstances and Strategic Decision-Making Process

6.9.1 Introduction

In the strategic management literature, upper echelons demography is a critical determinant of organisational processes including strategic decision making process with a direct effect on organisational performance (Goll and Rasheed, 2005). Demography refers to “*the composition, in terms of basic attributes such as age, sex, educational level, length of service or residence, race, and so forth of the social entity under study*” (Pfeffer, 1983, p. 303). Upper echelons demography acts as proxies for “*real*” cognitive and social processes (Pfeffer, 1983) and it has been regarded as a determinant of various organisational outcomes. The antecedents and outcomes of strategic decisions have been examined in previous studies (Rajagopalan et al., 1993; Bryson and Bromiley, 1993; Dean and Sharfman, 1996). However, organisational studies that have examined top management teams through a macro-organisational methodology have concluded with contradictory findings (Lawrence, 1997; Pettigrew, 1992; Priem et al., 1999).

In this thesis, Boards of Directors’ characteristics as well as external environmental dimensions are regarded as predictors of strategic decision-making process and organisational performance. Figure 6:4 presents the demographic predictors and the role of environmental dimensions to strategic decision-making processes namely: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

Figure 6:4 Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Strategic Decision-Making Process



H4a: Educated executives tend to pursue the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

Hypotheses H4a suggests that the higher the executives' educational level the more likely they will be to follow the following strategic decision-making processes. For the purpose of the hypotheses testing, two statistical approaches were applied: first, regression analysis (where the educational level of high school was considered as a baseline variable, therefore it has been deleted from the analysis) and second, GLM analysis. The findings from regression analysis revealed no significant association between managerial educational level and strategic decision-making processes of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication as Tables 6:37; 6:39; 6:41, 6:43; 6:45; 6:47; 6:49; 6:51; 6:53; 6:55; 6:57 indicate (Appendix F). Similarly, the results from GLM analysis (see Tables: 6:89- 6:96, Appendix G) were found to be along the same lines with the results from regression analysis. Neither statistical approach supports the suggested hypothesis.

Education level is regarded as an indicator of knowledge and skill base (Hambrick and Mason, 1984). It has been associated with tolerance for ambiguity, capacity for information processing and ability to identify and analyse alternative solutions (Wiersema and Bantel, 1992). Executives who have obtained a higher general educational level or

management educational level focus more on the analytical techniques in the strategic decision-making process compared to “*self-made*” executives (Goll and Rasheed, 2005). Scholars have reported an influence of boards’ characteristics on the strategic decision-making process (Tushman and Romanelli, 1985; Bantel, 1993; Smith et al., 1994). In particular, Goll and Rasheed (2005) found a positive relationship between educational background and the rationality in the strategic decision-making process. As in previous studies, top management team’s level of education is related to rationality (Hambrick and Mason, 1984; Wiersema and Bantel, 1992; Bantel and Jackson, 1989). This is in line with previous argumentation about the tendency of educated executives to pursue hierarchical decentralised strategic decisions (e.g. Hambrick and Mason, 1984; Papadakis, 2006).

In current study of Greek listed organisations, the demographic characteristics and the composition of boards’ members provide no statistical significant association with most of the strategic decision-making processes. A similar study conducted in 70 industrial firms in Greece, Papadakis and Barwise (2002) found that CEOs and top management teams’ educational level has no significant association with any of the strategic decision-making process characteristics.

In a sample of Greek manufacturing firms, Papadakis, Lioukas and Chambers (1998) found that education level is positively associated with financial reporting. Education level shows the degree of people’s information analysis (Dollinger, 1984). Educated CEOs are likely to demand detailed information and extensive financial reporting (Bantel, 1993).

Although, most of the studies in the strategic management field provide evidence of the relationship between educational level and characteristics of strategic decision-making process; it will be useful to take into account that previous studies have taken place in different cultural contexts which might affect the results of this study. In this respect, the strategic decision-making process and other organisational phenomena were examined according to their economic and cultural effects (Child, 2000).

H4b: The executives’ educational specialty is associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

This hypothesis is actually an expansion of the previous one, aiming to investigate the effect of demographic characteristics on different forms of strategic decision-making

process. More specifically, it interrogates the impact of different educational disciplines on financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. For the purpose of this hypothesis, GLM and multiple regression analyses were conducted by excluding the variable of civil engineering as a baseline variable. The results derived from GLM analysis do not provide significant evidence for the suggested hypothesis as illustrated in Tables (6:89-7:96, Appendix G) which in most of the cases are in accordance with the results extracted from regression analyses. Nevertheless, the statistical findings for hierarchical decentralisation show that executives with an educational specialty in sciences as well in social sciences tend to pursue lower level hierarchical decentralisation in the strategic decision-making processes as Tables 6:45 (sciences, $t=2.229$, $p<0.05$, social sciences, $t=2.440$, $p<0.05$) and Table 6:47 show (sciences, $t=2.249$, $p<0.05$, social sciences, $t=2.446$, $p<0.05$). Thus, this hypothesis is partially supported.

Apart from educational level, executives with different types of education are supposed to develop different problem-solving skills (Hitt and Tyler, 1991). Executives with formal education training in sciences and engineering have a better understanding of a company's technological base and are more likely to establish cooperative opportunities (Tyler and Steensma, 1998). Heilmeier (1993) suggested that technically trained executives have technical knowledge and are able to predict, comprehend and anticipate long-term change by identifying opportunities.

However, executives with only a formal management education are more likely to pursue short-term performance goals at the expense of innovation and long-term asset building compared to executives with other educational backgrounds (Hambrick and Mason, 1984). They claimed that business schools are not effective at developing risk-taking tendencies compared to technical schools that are risk-averse oriented. In summary, executives with technical education emphasise opportunities rather than on threats (Tyler & Steensma, 1998).

The empirical findings from Greek listed organisations revealed that the educational specialty of executives does not play a predominant role on the kind of strategic decision-making process. Greek executives in quoted organisation in the ASE might come from various educational backgrounds and not from a particular one in order to be able to

identify the explanatory power of a certain educational specialty on the firms' strategic decision-making processes.

H4c: The executives' functional background is associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication

Hypothesis H4c examines the effect of Greek executives' functional background on the strategic decision-making processes of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. The functional background of board members has been distinguished into two broad categories: the "*output*" and the "*throughput*" functions. The "*output*" functions includes functional areas relating to marketing, sales, merchandising as well as product research and development (R&D) whereas the "*throughput*" functions include areas of productions/operations, engineering, finance and accounting. Statistical multiple regression and GLM analyses with factors extracted with eigenvalue greater than one as well as forced factors did not produce any conclusive finding (see Tables 6:37; 6:39; 6:41; 6:43; 6:45; 6:47; 6:49; 6:51; 6:53; 6:55; 6:57; and 6:89-6:96, Appendices F,G). Thus, for the purposes of evaluating H4c, it can be claimed that these findings do not provide support for the hypothesis.

Functional background is a lens through which business situations are viewed (Guthrie and Datta, 1997), the way in which problems are defined (Dearborn and Simon, 1958). Hambrick and Mason (1984) have distinguished functional background into two broad categories the "*output*" functions which focus on opportunities and the "*throughput*" functions which focus on transformation process. This classification provides a linkage between functional background and organisational decision-making. The organisation's strategy partly determines the types of functional background that are essential for the firm's success (Hitt, Ireland and Palia, 1982). Technology oriented companies encourage the appointment of executives whose functional expertise is related to the firm's success (Datta and Guthrie, 1994). Executives with "*output*" background tend to have greater ambiguity and less control whereas those with "*throughput*" background tend more to control (Herrmann and Datta, 2002). Throughput backgrounds are important in industries which are characterized by high capital intensity or concentration and lower growth (Rajagopalan and Datta, 1996).

In a sample of 105 Greek quoted organisations, the executives come from various functional backgrounds, which did not allow us to provide any association between their functional background and the process of strategic decision-making that they pursue.

H4d: Long tenured executives in terms of industry, company and position tenure are associated with the following strategic decision-making processes: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

Hypothesis H4d attempts to associate one of the upper echelons' demographic characteristics, the tenure in terms of industry, company and position with the strategic decision-making process. The research outcomes that derived after multiple regression and GLM analyses are not able to explain the effect of tenure on the strategic decision-making processes of financial reporting, rule formalisation and lateral communication. However, the GLM analysis provides evidence of the effect of industry tenure on upper level hierarchical decentralisation factor which included the two influential individuals of the firm: the owner and the Chief Executive Officer, as well as on forced factor of hierarchical decentralisation as Tables 6:93 (sig.024, $p < 0.05$) and 6:94 (sig.053, $p < 0.05$) indicate. Therefore, partial support for H4d was observed.

The tenure of executives might influence the organisational processes and choices in various ways (Goll and Rasheed, 2005). On the one hand, long tenured executives might be passive (Hambrick and Mason, 1984), resistant to strategic changes (Wiersema and Bantel, 1992) and pursue strategies that they are more familiar and favourable for them (Herrmann and Datta, 2002). On the other hand, they are more familiar with the decision-making process and they have more experience and knowledge within the organisation (Herrmann and Datta, 2002) which allows them to pursue risky decisions (Finkelstein and Hambrick, 1996). In several studies, the effect of long tenured executives on the strategic decision-making processes has been examined.

Tushman and Romanelli (1985) argued that long tenured executives tend to pursue less rational decisions. However, Goll and Rasheed (2005) found a positive relationship between the tenure and the strategic decision-making process. Similarly, findings from a sample of Greek firms provide evidence that tenure is positive related to hierarchical decentralisation and to lateral communication (Papadakis and Barwise, 2002; Papadakis, 2006). The empirical findings are not in line with previous findings and apart from the

effect of tenure on hierarchical decentralisation (upper level); Greek echelons' tenure does not affect the strategic decision-making process in Greek boardrooms.

H4e: The various environmental dimensions influence the process of the strategic decision-making in terms of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

Finally, hypothesis H4e attempts to examine the moderating effect of various environmental dimensions on the strategic decision-making processes. Following the same statistical approaches as previously, the analysis disclosed significant results. Multiple regression analysis showed that Greek executives of listed organisations tend to pursue financial reporting in strategic decision-making during environmental dynamism in marketing practices (Tables 6:37; $t=2.754$, $p<0.05$ and Table 6:39; $t=2.498$, $p<0.05$). Additionally, Greek organisations operating in environmental competitors' dynamism are inclined to have rule formalisation in the strategic decision-making process as Table 6:41 indicates ($t=2.088$, $p<0.05$). Furthermore, in the case of environmental munificence or hostility, firms obtain a hierarchical decentralisation approach in the strategic decision-making process in periods of environmental munificent/hostility (see Table 6:53, $t=2.223$, $p<0.05$). Finally, companies that adopt lateral communication in their strategic decisions mainly in dynamic marketing practices (Table 6:55, $t= 3.106$, $p<0.05$) and in complex environments (see Table 6:55, $t= 2.372$, $p<0.05$). Similarly, Table 6:57 ($t=3.303$, $p<0.05$) shows a significant relationship between the forced factor of environmental dynamism and lateral communication.

The statistical outcomes that derived from GLM analysis demonstrate similar findings with those of regression analysis. Regarding the financial reporting, as illustrated in Tables 6:88 (sig.008, $p<0.05$) and Table 6:89 (sig. 016, $p<0.05$) environmental dynamic environments favour financial reporting in the strategic decision-making process. In accordance with the previous result, companies operating in competitors' dynamic environments follow rule formalisation in their strategic decisions (see Table 6:90; sig.042, $p<0.05$). Hierarchical decentralisation as a strategic decision making process is adopted within hostile or munificent environments (see Table 6:94; sig. 030, $p<0.05$). Concerning lateral communication, the results reveal that this strategic approach is adopted in complex environments (see Table 6:95; sig. 022, $p<0.05$) of with forced factors in dynamic

environments (see Table 6:96, sig. 011, $p < 0.05$) and in complex environmental circumstances (Table 6:96, sig. 002, $p < 0.05$).

Scholars argue that organisations are required to respond to environmental changes by introducing strategic changes (Child, 1972; Pfeffer and Salancik, 1978; Tushman and Romanelli, 1985). Hitt and Tyler (1991) attempted to identify the factors that influence the strategic decision-making process in order to provide a better understanding of strategic decision-making processes. Most of the scholars have attempted to examine the influence of environmental characteristics on the rationality of strategic decision-making process (e.g. Agor, 1989; Bresser and Bishop, 1983; Cyert and March, 1963; Hart, 1992; Miller et al., 1988). Elbanna and Child (2007) have reported a significant influence of environmental dimensions on the strategic decision-making process which is consistent with the results of other scholars (e.g. Bourgeois and Eisenhardt, 1988; Kukalls, 1991; Bresser and Bishop, 1983; Fredrickson and Mitchell, 1984). Furthermore, rationality has been associated with outperforming organisations operating in munificent or dynamic environments. In addition, Goll and Rasheed (2005) concluded that environmental munificence has a moderating effect on the rationality of strategic decision-making process. Similarly, Priem et al. (1995) reported a positive relationship between rationality and performance in organisations operating in dynamic rather than stable environments.

Most of the studies so far, have examined the impact of environmental dimensions on the rationality of the strategic decision-making process.

The current study examines the impact of various environmental dimensions on different strategic decision-making characteristics namely: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. The findings suggest an effect of environmental dynamism and munificent/hostility on the strategic decision-making process of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. This indicates that the strategic decision-making processes have been influenced mainly by two environmental dimensions: dynamism and munificence or hostility.

Papadakis and Barwise (2002) suggested that environmental hostility had little influence on SDM processes and particularly in the hierarchical decentralisation. Their work reported a marginally significant association between environmental hostility and

hierarchical decentralisation. This indicates that in hostile environments, executives might have a tighter centralisation in decision-making and a restrained flow of information (Child, 1972). The research findings that derived from 105 Greek firms showed that the external environment in which companies operate play an influential role in their strategic decision-making processes. It seems that environmental dimensions are more important determinants of Boards of Directors' strategic decisions rather than their demographic or composition characteristics.

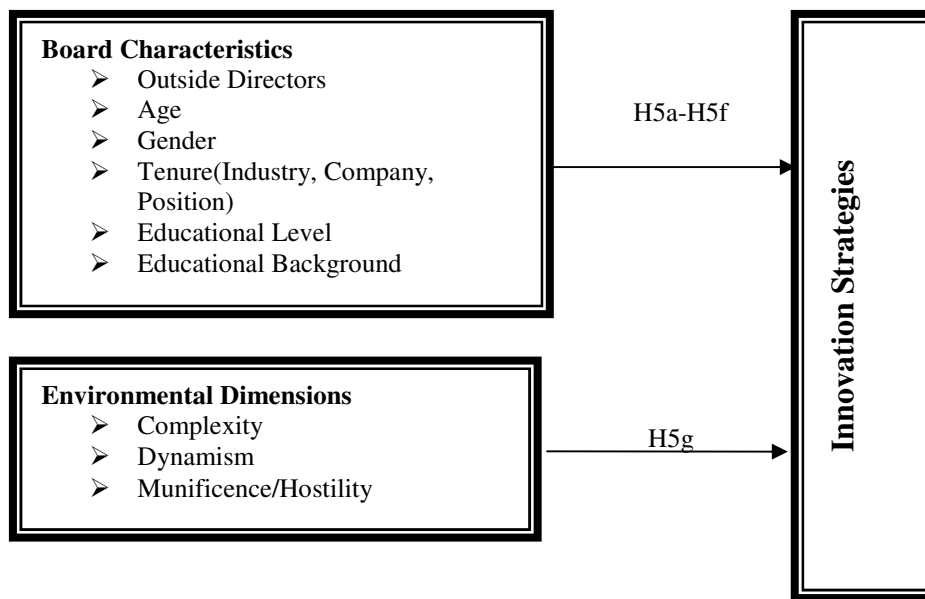
6.10 Board Characteristics, Environmental Dimensions and Innovation Strategies

6.10.1 Introduction

The strategic choice paradigm (Child, 1972) postulates that key decision-makers have considerable control over an organisation's future direction. In the Upper Echelons perspective, Hambrick and Mason (1984) introduced the coalignment between strategy and managerial characteristics. It provides a framework, which examines how executives influence the strategic choices (Wiersema and Bantel, 1992; Bantel and Jackson, 1989; Finkelstein and Hambrick, 1990). However, the studies so far, resulted in inconclusive findings (e.g. Tushman and Romanelli, 1985; Murray, 1978; Smith et al., 1994). This can be explained by the fact that is not very clear which demographic characteristics influence the strategic choice of innovation and under which environmental circumstances.

Many researchers attempted to examine the key parameters that enhance firm's innovation policies. The following hypotheses aim to identify whether board composition and external environment have any influential role on how Greek executives pursue innovation practices. Figure 6:5 presents the interrelationships between board characteristics and innovation policies.

Figure 6:5 Hypothesised Research Model between Board Characteristics, Environmental Dimensions and Innovation Strategies



H5a: Outside directors are positively related to firm’s innovation strategies.

Hypothesis H5a examines whether the proportion of outside or external directors contribute to the innovation. Statistical results that derived from both multiple regression (see Tables: 6:59, 6:61, 6:63, 6:65, 6:67, Appendix F) and GLM (see Tables 6:97-6:101, Appendix G) disclosed insignificant findings. Therefore, this hypothesis found no support. Few studies so far, have found an association between board demographic variables and innovation practices which is limited in the board composition. Proponents of strategic choice theory report that inside directors provide valuable insights and information to boardroom, since they initiate discussions and actively participate in the strategic decisions (Baysigner and Hoskisson, 1990). Researchers have found that inside directors enhance innovation practices (Baysigner, Kosnik and Turk, 1991; Zahra, 1996; Hoskisson, Hitt, Johnson and Grossman, 2002). However, agency theorists argue that outsiders tend to be vigilant and actively participate in board tasks and in firm’s strategy. In addition, outsiders, due to the fact that they are not employees of the organisation, are not controlled by the executives and particularly by the CEO, and therefore they can propose innovation strategies contrary to CEO will (Johnson et al., 1993). The results demonstrate that the proportion of outside or inside directors respectively has no effect on the innovation strategies. Apparently, board composition is not an influential factor for Greek Boards of

Directors to pursue innovative practices. This is aligned to what was reported in a recent study carried out in Italian firms (Zona, Huse, Minichilli and Zattoni, 2006).

H5b: Young executives are more likely to pursue innovative practices

Hypothesis H5b suggests a relationship between executive's age and innovation practices with respect to product, process and organisational innovation. The results from multiple regression analysis revealed a strong but negative association between the age and product and process innovation (see Table 6:59, $t = -2.037$, $p < 0.05$) as well as age and the forced factor of process innovation (see Table 6:65, $t = -2.429$, $p < 0.05$).

Similarly, the results derived from GLM analysis were in line with those of regression analysis, since the analysis showed significant findings between age and the factor of process and product innovation (Table 6:97, sig.049, $p < 0.05$) as well as the forced factor of process innovation (Table 6:100, sig.020, $p < 0.05$). Therefore, the findings support the suggested hypothesis.

Age is regarded as an indicator of experience and a signal of a person's propensity for risk-taking and change (Herrmann and Datta, 2005). An individual's age is expected to influence strategic decisions and choices (Wiersema and Bantel, 1992); as age increases, flexibility and resistance to change decrease. Younger managers are more willing to adopt new ideas and behaviours such as innovation and they may pursue risky strategies (Hambrick and Mason, 1984). In addition, age is associated with corporate growth and innovation strategies (Child, 1974; Hart and Mellons, 1970). Studies conducted by Child (1974) and Norburn and Birley (1988) indicated that younger managers achieve superior performance. In addition, they are expected to be better educated and to have more current technical knowledge (Bantel and Jackson, 1989).

On the contrary, older managers consider financial and career security very important, thus they might avoid risky actions that could change the firm's strategic direction (Vroom and Pahl, 1971). Older executives tend to have less confidence in their decisions and therefore they may lack the conviction necessary to provide leadership for strategic change (Taylor, 1975). In a study of 500 top executives conducted by MacCrimmon and Wehrung (1990), it was found that the most mature executives proved to be risk averse and resistant to change. In addition, other scholars (Grimm and Smith, 1991; Wiesema and Bantel, 1992) reported that the younger executives contribute to organisational change. However, Bantel

and Jackson (1989) found no impact of average Top Managers' age on firm's innovation. Similar findings have been reported in other studies where age does not significantly affect initiation, adoption decision or implementation, innovation (Huber and Durfee, 1993; Nystrom et al., 2002; Damanpour and Schneider, 2006). The findings from the study suggest a strong but negative relationship between executives' age and product, process and organisational innovation. The majority of Greek listed firms consist of mature executives who are reluctant to pursue innovative strategies and high risk strategies.

H5c: Gender is unrelated to firm's innovative practices

Hypothesis H5c argues that the gender of Greek executives did not affect their decisions towards innovation policies. In order to test this hypothesis two statistical approaches were applied regression and GLM. However, the results that derived with both statistical methods concluded that gender has no impact on innovation practices for Greek listed firms as tables 6:59, 6:61, 6:63, 6:65, 6:67 and 6:97-6:101, Appendices F, G indicate. Thus, this hypothesis is confirmed.

Several studies have attempted to examine the influential role of certain demographic attributes, among them the executives' gender on innovation practices resulting in mixed results. Stelter (2002) argued that women have a transformational leadership style which encourages innovation adoption. Sonfield et al. (2001) claimed that there is no difference between the gender of business owners and venture innovation practices. Damanpour and Schneider (2006), also, could not provide any support between gender and innovation adoption or implementation. Consistent with previous studies are the results of this study which indicate no effect of gender on the innovation practices of Greek corporations.

This is explained by the fact that female representation in Greek boardrooms is very low. Despite the fact that Greek women are well-educated, they are under-represented not only in managerial positions but generally in Greek business community (Papalexandris and Bourantas, 1991; Petraki Kottis, 1996).

H5d: Executives' tenure (in terms of industry, company and position) is related to firm's innovation practices

Hypothesis H5d suggests that the number of years that Greek board members have spent in the current industry, company or position is associated with innovation practices. However, the results of this study are not able to support this proposition. The empirical findings extracted from multiple regressions and GLM did not provide any association between tenured executives and innovation policies as Tables 6:59, 6:61, 6:63, 6:65, 6:67, and 6:97-6:101 illustrate in the Appendices F, G.

Tenure is regarded as a key indicator of managers' ability to gather information, as tenure increases the amount of information gathered and processed declines (Miller, 1991). Newly appointed directors are willing to learn and expand their skills and expertise (Zona, Huse, Minichilli and Zattoni, 2006) and are open to innovation (Huber and Durfee, 1993). As Finkelstein and Hambrick (1996) claimed executives over time develop new habits, establish routines and rely more on their previous experiences. In addition, they accept the organisation as it is and they are reluctant to suggest or adopt new ways of doing things (Hambrick and Mason, 1984; Huber and Durfee, 1993). Long tenured managers prefer to focus more on stability rather than on pursuing innovation strategies (Barker and Mueller, 2002; Thomas et al., 1991). Hambrick and Mason (1984) stated that CEO tenure encourages R&D investment and product development.

The findings demonstrate no effect of Greek executives' tenure on any innovation practices which are aligned to what reported in similar studies (Damanpour and Schneider, 2006; Zona, Huse, Minichilli and Zattoni, 2006).

H5e: The amount of formal education is positively related to formal innovation strategies.

Hypothesis H5e advocates a positive relationship between educational level and innovation strategies. This hypothesis was tested with regression analysis (high school was omitted as a baseline variable) and GLM analysis, where the results disclosed insignificant associations between the Greek executives' educational level and the degree of innovation practices. Therefore, this hypothesis was rejected.

The educational level of executives reflects the degree of knowledge and skills and their ability to suggest creative solutions in order to solve complex problems (Bantel and Jackson, 1989). Scholars (e.g. Kimberly and Evanisko, 1981; Bantel and Jackson, 1989; Rogers and Shoemaker, 1971) state that educated executives are aware of the need for

change and they are receptive to innovation. Camelo-Ordaz et al. (2005) found that the TMT's educational level exerts a positive effect on organisational innovation. On the contrary, Damanpour and Schneider (2006) did not support any evidence between the executives' educational level and the firm's innovation practices. Greek educated managers engage excessive analysis to the disadvantages of the decision-making process due to their ability to process information and to forecast the threats and the opportunities prior to any decision; therefore, they seem to be reluctant to pursue innovation practices.

H5f: Specific educational specialty favours firm's innovation strategies.

This hypothesis is actually an expansion of the previous one aiming to investigate the effect of different educational disciplines on the innovation practices of product, process and organisation. For the purpose of this hypothesis, GLM and multiple regression analyses were conducted by excluding the variable of civil engineering as a baseline variable. The results derived from GLM analysis do not provide significant evidence for the suggested hypothesis as illustrated in Tables (6:97-6:101, Appendix G) which is in accordance with the results extracted from regression analyses (Tables: 6:59, 6:61, 6:63, 6:65, 6:67). Thus, for the purposes of evaluating H5f, it can be claimed that these findings do not provide support for the hypothesis.

Executives with formal education training in sciences and engineering are likely to understand the technological base of the company and to be more favourable to cooperative opportunities. Heilmeier (1993) suggested that technically trained executives are aware of relevant technologies and are able to predict, comprehend and anticipate long-term change. The empirical studies of Gupta and Govindarajan (1984) have indicated that experience in marketing and sales were associated more with taking growth strategies than taking harvest strategies.

Executives with only formal management education are more likely to pursue short-term performance goals at the expense of innovation and long-term asset building compared to executives with other educational background (Hambrick and Mason, 1984). They claimed that business schools are not effective at developing risk-taking tendencies compared to technical schools that are risk-averse oriented. Focusing on business education and more specifically on MBA programmes, students are risk-averse and resistant to innovation (Finkelstein and Hambrick, 1996). However, executives with technical education in science and engineering have a complete understanding of technology and innovation and are likely to focus more on opportunities than on threats (Tyler & Steensma, 1998). The

empirical findings did not support the association between educational specialty and innovation practices. Greek executives come from various educational specialties which does not allow us to conclude that managers from certain fields are more receptive to innovation compared to others.

H5g: The various environmental dimensions influence the innovation strategies.

The final hypothesis attempts to investigate how Greek executives pursue innovation strategies within various environmental dimensions. More specifically, it examines the moderating role of the external environment towards Greek firms' innovation processes. Following the same statistical approaches as previously, the analysis disclosed significant results. More specifically, the regression analysis that was conducted with factors for environment and innovation with eigenvalue greater than one showed that Greek companies pursue product and process innovation practices while they operate in dynamic marketing practices environments (Table 6:59, $t=2.862$, $p<0.05$) and in competitors' dynamic environment (Table 6:59, $t=2.807$, $p<0.05$). Furthermore, the results derived from forced factors concluded with significant findings. The results indicate that Greek executives adopt product innovation practices (Table 6:63, $t=2.076$, $p<0.05$) and process innovation (Table 6:65, $t=1.979$, $p<0.05$) respectively when their organisations operate in complex environments. GLM analysis revealed the same results. Table 6:97 illustrates that organisations which face environmental dynamism in marketing practices (sig. 007, $p<0.05$) as well as environmental competitors' dynamism (sig.008, $p<0.05$) obtain product and process innovation practices. In addition, GLM disclosed the same findings with forced factors. It has been proved that firms operating in complex environments are likely to pursue product innovation (Table 6:99, sig.045, $p<0.05$) as well as process innovation practices (Table 6:100, sig.055, $p<0.05$). Thus, for the purposes of evaluating H5g, it can be claimed that these findings provide support for the hypothesis.

Innovation has been of central interest in recent years because of its importance for organisational survival and competitive advantage due to global competition, technological and market changes (Tushman and O'Reilly, 2002; Damanpour and Schneider, 2006). Competition increases the chances for organisational innovation (Utterback, 1974) and Kimberly and Evanisko (1981) found it to be an important predictor for technological and administrative innovation.

Empirical studies have examined the adoption of various innovation strategies within certain environmental dimensions. The global environment is driving companies to find new ways to conduct businesses in order to survive (Stopford, 2001). Managers have to understand the different environmental dimensions in which their organisations operate and act accordingly. Firms operating in dynamic or turbulent environments are externally oriented, proactive in pursuing emerging market opportunities and undertake innovation strategies (Crant, 2000; Naman and Slevin, 1993; Dess et al., 1997; Markides, 1998). Firms operating in hostile environments introduce new products, are risk-taking and proactive compared to those operating in dynamic environments that are technology-oriented (Miller and Friesen, 1983). Other studies have shown that both environmental turbulence and complexity are associated with innovation and risk taking (Naman and Slevin, 1993; Zahra, 1991).

The empirical results from a sample of 105 Greek listed organisations are in accordance with previous studies indicating that companies operating in dynamic and complex environments pursue product and process innovation practices. Greek executives tend to be proactive and innovative in circumstances of environmental uncertainty in order for their organisations to maintain their competitive position in the industry.

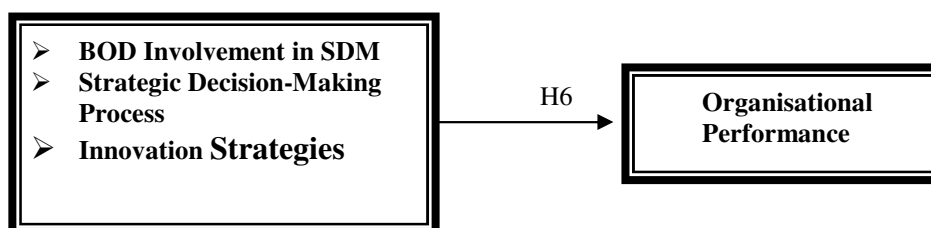
6.11 Organisational Performance

6.11.1 Introduction

Organisational performance is a complex and multidimensional phenomenon in strategic management literature (Venkatraman and Ramanujan, 1986). Recent reviews on Boards of Directors have been dominated by a tradition in which board composition is related to corporate financial performance (Johnson et al., 1996; Pettigrew, 1992; Zahra and Pearce, 1989) and mainstream research has been heavily influenced by a research tradition from financial economics and theories treating the board as a so-called “*black box*” (Daily et al., 2003; Finkelstein and Mooney, 2003). Researchers agree that predictions about the impact of board demographic characteristics and organisational performance are not clear. After extensive research on Boards of Directors, Pettigrew (1992, p. 171) concluded that “*Great inferential leaps are made from input variables such as board composition to output variables such as board performance with no direct evidence on the processes and mechanisms which presumably link the inputs to the outputs*”. The research so far is based on theoretical reflections about board role expectations, but actual board task performance is rarely measured (Gabrielsson and Huse, 2004). The research objectives of the study are to introduce an integrative theoretical framework and examine how Boards of Directors

and their demographic characteristics influence strategic decision-making processes as well on strategic choice of innovation and consequently firm's performance. The Figure 6:6 below indicates an effect of board involvement, strategic decision-making processes and innovation practices on the financial performance of Greek companies.

Figure 6:6 Hypothesised Research Model between BOD Involvement, Strategic Decision-Making, Innovation and Organisational



H6: The impact of involvement, strategic decision-making processes and innovation strategies to the firm's overall performance.

The purpose of the concluding hypothesis of the study is to examine the final outcome of board involvement in the strategic decision-making process, the strategic decision-making processes of financial reporting, rule formalisation, hierarchical decentralisation as well as lateral communication and finally the innovation practices on the organisational performance. This hypothesis was developed in order to investigate the influential role of key strategic decisions that Boards of Directors pursue towards the organisational performance. Results derived from regression analysis (Table 6:69: $t=2.223$, $p<0.05$ and Table 6:71: $t=2.590$, $p<0.05$) and GLM analysis respectively (Table 6:102, sig.033, $p<0.05$ and Table 6:103, sig.014, $p<0.05$) concluded that only financial reporting in the strategic decision-making process ameliorates firm's performance.

Few scholars have examined the impact of the strategic decision-making process to the firm's performance (e.g. Bourgeois, 1980; Bourgeois and Eisenhardt, 1988; Dess, 1987; Goll and Rasheed, 1997). In particular, Goll and Rasheed (2005) provided support for the association between rationality in the strategic decision-making process and organisational performance during munificent environments. Furthermore, researchers (Fredrickson, 1984; Fredrickson and Mitchell, 1984) found that comprehensiveness in decision-making contribute to higher organisational performance in stable rather than dynamic environments. Bourgeois and Eisenhardt (1988) concluded that the more analytical the strategic decision-making process is the higher the organisational performance during velocity environments will be. Concerning rule formalisation and performance, scholars

have reported a positive relationship (Dess and Origen, 1987; Pearce, Robins and Robinson, 1987; Grinyer and Norburn, 1977-78). The involvement of middle level management in the strategic decision-making process enhances organisational performance (e.g. Bourgeois and Eisenhardt, 1988; Burgelman, 1983; Wooldridge and Floyd, 1990). Outstanding performance can be achieved with centralised and decentralised strategic decisions (Bourgeois and Eisenhardt, 1988). Papadakis (1998) suggested a positive relationship between financial reporting and long term organisational performance. Judge and Zeithmal (1992) found that board involvement in the strategic decision-making process contributes to organisational performance. Scholars have portrayed the upper Echelons' characteristics as determinants of strategic choices and their outcome to organisational performance (Smith et al., 1994; Hambrick and Cho, 1996; Finkelstein and Hambrick, 1990). Bertrand and Schoar (2003) conducted a longitudinal study and concluded that certain strategic choices: cash holdings, advertising investments, acquisitions, R&D have improved the financial position of the firm. In a study of microcomputers manufacturing firms, innovation is related to performance during dynamic environments. Additionally, fast innovation practices (Lawless and Anderson, 1996) as well as R&D (Chaney and Devinney, 1992) enhance organisational performance.

The organisational performance of Greek listed organisations in the ASE seems to be influenced by neither the strategic-decision-making process nor the strategic choice of innovation. The findings showed that companies that have adopted the financial reporting in their strategic decision-making process have higher financial performance. This might occur due to the fact that there are several organisational, environmental and decision factors that moderate the relationship between strategic decisions characteristics as well as strategic choices and organisational performance.

6.12 Presentation of the Hypothesised Empirical Framework and Results

In the part below, Tables 6:2-6:5 present the significant results of both regression and GLM analyses. Both significant and insignificant findings can be found in the Appendix H. Appendices F, G present in details the results of regression and GLM analyses.

Table 6:2Regression Analysis Results (factors with eigenvalue greater than one)	Hypotheses	t-value	p	Statement
H1e	Dynamic environment- leadership structure	2.271	.026	Significant
H2a	Firm's size-board size	3.524	.001	Significant
H2c:	Board size-executive BODs	4.494	.000	Significant
H2d	Board size-Non- executive BODs	7.853	.000	Significant
H3c	Frequency of BODmeetings- SDM involvement	-2.031 -2.031 -2.126	.009 .047 .038	Significant (INVSDM1) Significant(INVSDM1) Significant(INVSDM3)
H3d	Duration of BOD meetings- SDM involvement	2.749 2.848 2.641 3.238 2.033	.008 .006 .011 .002 .047	Significant (INVSDM2) Significant (INVSDM2) Significant (INVSDM2) Significant (INVSDM2) Significant
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.229	.030	Significant(HIER,scienc es)
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.754 2.088 3.106 2.372	.008 .042 .003 .022	Significant(ENV1,FINR EPORT) Significant(ENV3,R.F) Significant (ENV1,LC) Significant (ENV4,LC)
H5b	Age- innovation	-2.429	.020	Significant
H5g	Environment- innovation	2.076	.045	Significant (ENV3,PROD)
H6	BOD involvement , SDM and innovation- organisational performance	2.223	.033	Significant (Fin.Rep, Org.Perf)

Table 6:3 Regression Analysis Results (forced factors)	Hypotheses	t-value	p	Statement
H1e	Dynamic environment- leadership structure	2.343	.022	Significant (ENV1)
H2a	Firm's size-board size	3.524	.001	Significant
H2c	Board size-executive BODs	4.494	.000	Significant
H2d	Board size-Non- executive BODs	7.853	.000	Significant
H3c	Frequency of BODmeetings- SDM involvement	-2.031 -.2031	.009 .047	Significant (INVSDM1) Significant (INVSDM3)
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.335	.023	Significant(sciences)
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.498 2.223 2.660 3.303	.016 .030 .011 .002	Significant(ENV1,FINREPO RT) Significant (ENV1,HIERDEC) Significant (ENV1,LATCOMM) Significant (ENV3,LATCOMM)
H5b	Age- innovation	-2.429	.020	Significant (Process Inn. Age)
H5g	Environment-innovation	2.076	.045	Significant (ENV3,PROD)
H6	BOD involvement , SDM and innovation- organisational performance	2.590	.014	Significant(FR,ORGPFR)

Table 6:4 GLM Analysis Results (factors with eigenvalue greater than one)	Hypotheses	p	Statement
H1e	Dynamic environment- leadership structure	.026	Significant
H2a	Firm's size-board size	.001	Significant
H2c:	Board size-executive BODs	.000	Significant
H2d	Board size-Non-executive BODs	.000	Significant
H3b	Inside directors-SDM involvement	.019	Significant (INVSDM3)
H3c	Frequency of BODmeetings-SDM involvement	.000	Significant (INVSDM1)
H3d	Duration of BOD meetings- SDM involvement	.044	Significant (INVSDM3)
H4d	Industry,company, position tenure-financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.024	Significant (upper level hier.dec)
H4e	Environment-financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.008 .042 .003 .022	Significant(ENV1,FINREPORT) Significant(ENV3,RULEFORM) Significant (ENV1,LATCOMM) Significant (ENV4,LATCOMM)
H5b	Age- innovation	.049	Significant (Product &Process)
H5g	Environment-innovation	.007 .008	Significant (Prod&Proc.,ENV1) Significant (Prod. &Proc., ENV4)
H6	BOD involvement , SDM and innovation-organisational performance	.033	Significant (FINREPORT)

Table 6:5 GLM Analysis Results (forced factors)	Hypotheses	p	Statement
H1e	Dynamic environment- leadership structure	.022	Significant
H2a	Firm's size-board size	.001	Significant
H2c:	Board size-executive BODs	.000	Significant
H2d	Board size-Non-executive BODs	.000	Significant
H3c	Frequency of BODmeetings- SDM involvement	.000	Significant (INVSDM1)
H3d	Duration of BOD meetings- SDM involvement	.000	Significant (INVSDM2)
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.016 .030 .011 .002	Significant(ENV1,FINREPORT) Significant(ENV3,RULEFORM) Significant (ENV1,LATCOMM) Significant (ENV3,LATCOMM)
H5b	Age- innovation	.020	Significant (Pr&PC,and Age)
H5g	Environment- innovation	.045	Significant (Prod.Proc.Inn.,ENV1)
H6	BOD involvement , SDM and innovation- organisational performance	.014	Significant (FINREPORT)

6.13 Concluding Remarks

This chapter has documented the results of correlation analyses examining first, the influence of external environment to Boards of Directors' characteristics as well as on firm's strategic decisions and second, the impact of Boards of Directors' attributes on the strategic decision making processes and on the strategic choice of innovation and consequently on firm's performance. Compelling evidence was provided in support of a number of hypotheses and discussion was given to each of these bivariate relationships.

The results of the study have been compared with other studies in the area and the conclusions drawn represent the process of strategic decisions in Greek organisations.

Multivariate statistical techniques such as ordinary least squares linear regression as well as general linear model (GLM) analyses were executed in order to gain an insight into the extent of association between the variables. The test of the model presented in Chapter 2 was conducted using two statistical techniques: linear regression and GLM analyses. Enter linear regression analysis, supported some of the research hypotheses. However, the GLM revealed as well some significant relationships between the variables. It is worth mentioning that the results from GLM analysis were on lines with the regression results. The cases when the statistical analyses approaches revealed different results were only when in the regression analysis the independent variables were categorical, thus it had to be transformed into a binary variable. The results for both statistical analyses methods were presented by using factors with eigenvalue greater than one as well as by using forced factors. The purpose of using such comprehensive statistical analyses approaches was to provide an insight understanding of the robust associations between the variables. The Tables below present a comprehensive synopsis of the research findings. Tables 6:2-6:5 present detailed findings from both statistical analyses accompanied with statistical significances. The Tables in the Appendix H (Tables HA-1 to HA-4) present the empirical findings that have been derived from regression analysis with factors with eigenvalue greater than one and forced factors and from general linear model analysis with factors with eigenvalue greater than one and forced factors.

The following chapter presents the conclusions and the contributions of this study and suggests its implications for academics and business practitioners. Avenues for future research are also presented along with the areas of most worthy theoretical contributions.

CHAPTER 7

Conclusions, Contributions and Directions for Further Research

7.1 Introduction

Research on the Boards of Directors was motivated by renewed interest evinced due to recent corporate failures and scandals. Increased attention on accountability and transparency in firms led to a number of countries issuing corporate governance regulations, codes and principles. The establishment of formal regulations would result in a better governance system that could improve organisational performance.

Boards of Directors are considered as a social construction groups which are expected to play a more active role in discharging their fiduciary role for improving organisational performance. This thesis was set up to investigate the factors that shape strategic decisions in Greek listed organisations in an attempt to assist executives to improve organisational performance. This study is applied to Boards of Directors of Greek listed organisations. More specifically, it attempted to examine the impact of external environment on board composition; to identify the characteristics of board members that have an effect on the involvement in strategic-decision making; on the strategic decision-making processes; and on the strategic choice of innovation. Finally, it investigated the impact of strategic decisions on the performance of Greek firms.

Based on different theoretical perspectives and a review of extant literature, an integrative theoretical framework was developed which is composed of environmental dimensions, board characteristics (composition, demographic attributes), board involvement in the decision-making process, strategic decisions (processes and innovation as a strategic choice) and organisational performance. Alongside the theoretical framework a set of hypotheses have been developed.

The data for this study was drawn from publicly listed firms on the Athens Stock Exchange during 2007. The sample consists of 105 Greek listed organisations. Multiple regression as well as GLM techniques were used to test the hypothesized relationships.

7.2 Conclusions of the Study

Chapter Seven summarises the findings of the study. It refers to the conceptual framework of the study and it allies the research objectives with the conclusions of the study. Specific research objectives are proposed and a summary of the conceptualisation is proposed which are followed by presentation of the results. Furthermore, this chapter also refers to the main contributions of the thesis, the implementations for business practitioners and suggestions for future research.

The analysis and discussion presented in Chapter Six provide an insight into the key factors that influence the strategic decisions of Greek executives. The results of this study have been compared with previous studies and they are linked with relevant theories in strategic management. Tables (6:1a, 6:1b, 6:2, 6:3a, 6:3b, 6:4a1, 6:4b1, 6:4b2, 6:4b3, 6:4b4, 6:4b5, 6:5a, 6:5b, 6:6a, 6:6b, Appendix E) illustrate the results of bivariate correlation with forced as well as with factors with eigenvalue greater than one. Furthermore, the Tables demonstrate the results from multiple linear regression (Appendix F) and GLM (Appendix G) which were used in order to test the research hypotheses. The study suggests the driven forces of strategic decision making among Greek executives. The empirical examination of the hypotheses developed from the conceptual framework presented in this study revealed a set of mixed results.

First, the external environment was found not to be significantly associated with the board composition with respect to board size and the number of interlocking directorates. However, the findings suggest a strong association between dynamic or otherwise uncertain environments and the dual leadership structure. The results indicate that Greek listed organisations tend to have a unified leadership structure that facilitates the strategic decision-making during dynamic environments. In case of uncertainty, Greek companies tend to rely on a dominant CEO which is attributed to the large power distance in Greek society (Hofsted, 1980) and the expected small and medium size of many Greek firms run by a dominant owner-manager. Single and powerful leadership is more proactive and effective on strategic decisions. Therefore, Greek firms rely on a single leader when they need guidance and direction which become more intense during crisis.

Second, organisational theorists have linked organisational characteristics with board characteristics with an outcome on firm's financial performance (Kakabadse, 1991). Multiple regression and GLM analyses revealed a positive and strong relationship between

organisational size and board size as well as board size and number of executives and non-executive directorates. Nevertheless, the findings could not provide evidence for any effect of board size on organisational performance. Apparently, there are other factors that contribute to firm's performance of Greek listed organisations and not the number of board members.

Third, results from multiple regression analysis revealed that apart from the duration of board meetings, none of board composition characteristics or the external environment has an effect on the strategic decision-making process. However, the GLM analysis concluded with slightly different results; inside directors were found to be related to the evaluation process of board involvement (INVSDM2), the frequency of board meetings to be related to formation process of strategic decision-making (INVSDM1) and also, the duration of board meetings to evaluation stage of board involvement in the strategic decision-making. Overall, the findings show that Greek companies place a great emphasis on formal procedures –board meetings frequency and duration- rather than the demographic characteristics of the board in the board strategic involvement. Greek executives focus a lot on the interaction within the boardroom and they try to explore how to contribute to the “value creation process”. This shows that Greek companies are moving towards a more team-based management which requires an increased participation in the making of major decisions.

Fourth, in the strategic management literature, Boards of Directors are regarded as the apex of each organisation. Forbes and Milliken (1999) present the board as a social construction and employ cognitive theories to understand boards. They argue that boards should be understood through attributes of the board members, the board's working styles, and actual board task performance. They align attributes to boards, as with any other decision-making group, including preparation and the use of knowledge and skills, cognitive conflicts, effort norms. In this thesis, Boards of Directors as well as their demographic characteristics and external environment are regarded as predictors of the strategic decision-making process of financial reporting, rule formalisation, hierarchical decentralisation and lateral communication. Multiple regression analysis was executed and demonstrated that only environment has an effect on the Greek firms' on strategic decision-making process. Nevertheless, GLM analysis revealed some interesting findings. Greek executives with an educational specialty in social sciences tend to have a lower level hierarchical decentralised strategic decision-making process. On the contrary, executives with high

tenure showed a tendency towards an upper level hierarchical decentralisation process where the two individuals that participate in the strategic decisions are the owner of the company and the CEO. Regarding the effect of external environment, the results from GLM analysis are consistent with multiple regression analysis. Basically, our findings suggest that companies operating in either dynamic or complex environments are more likely to pursue a set of strategic decision-making processes. The findings are novel for a country like Greece.

Although we could expect to find that the personal attributes of dominant executives would be influential in the strategic decision-making, the results have shown that the external environment matters more for the strategic decisions of Greek Directors. The lack of CEO dominance over strategic decisions can be explained first, by the fact that our sample consist of large Greek organisations in which all Board members participate equally in strategic decisions. A second explanation is that Greek organisations are operating in an increasingly competitive global environment, and in order to survive Directors have to be responsive to external stimuli by introducing effective changes in the structures and procedures including a more team-based style of decision-making.

Although we could expect that Greek managers would defer to a higher level of authority, the environmental uncertainty facing business in the region made them consider external threats such as high interest rate, changes in the system problem of contracting, problem of lack in liquidity and declining demand lack prior to any strategic decisions. The results of the study allowed us to draw some general overviews on how Greek Boards of Directors affect the strategic decision making-process alongside the influence of the external environment.

Fifth, the strategic choice paradigm (Child, 1972) postulates that key decision-makers have considerable control over an organisation's future direction. In the Upper Echelons perspective, Hambrick and Mason (1984) introduced the coalignment between strategy and managerial characteristics. It provides a framework, which examines how managers influence organisational outcomes. Organisational outcomes such as strategies and performance are expected to reflect the characteristics of the leaders. This research attempted to examine how demographic characteristics of the executives and the environmental circumstances influence the strategic choice of innovation. Both multiple regression and GLM analyses revealed an association between the executives and the product and process innovation as well between age and the forced factor of process

innovation. The findings suggest that the older the Greek executives the more reluctant they will be to pursue innovation practices. This is explained by the fact that average age of Greek executives is higher compared to the other counterparts. The organisational structure in Greek companies is hierarachical and the employees are promoted slowly to the organisational hierarchy. Regarding the external environment, the findings show that companies operating in dynamic environments in terms of marketing practices as well as competitors tend to be proactive and pursue product and process innovation practices. So far the majority of Greek organizations lack financial and technological resources, outdated production methods and at the same time they are characteriuzed by “passivity” in marketing, autocratic systems and limited use of modern management tools and systems to support strategic decisions (Bourantas and Papadakis, 1997; Bourantas, Anagnostelis and Mantes, 1990, Makridakis et al., 1997). However, the situation in Greece has changed dramatically after its integration in EMU. The institutional environment has exerted strong pressures towards modernization and the improvement of the competitiveness on macro- and microeconomics fronts (Kazakos, 2001). Therefore, Greek organisations adopt several innovative strategies in order to compete with more advanced economies and play a key decision-making role in Balkan countries.

Finally, the results derived from multiple regression and GLM analyses are consistent indicating that only financial reporting contributes to firm’s financial performance. The empirical results show that a key determinant of organisational performance is the financial reporting as a strategic decision-making process. It implies that Greek firms rely on formal financial reporting activities when making strategic decisions as multinational counterparts.

According to the above findings, we have rehypothsized the proposed model presented in Figure 2:2. A new empirical model has derived from the multiple regression analysis (Figure 7:1), from the GLM analysis (Figure 7:2) and a final comprehensive model presented in Figure 7:3.

Figure 7:1 shows how Greek executives pursue strategic decisions. The results suggest that dynamic environments favour the dual leadership structure. A positive association was found between organisational characteristics and board characteristics. Also, the frequency and the duration of board meetings have an effect on board participation in strategic decisions. One of the key findings of the study is that external environment influence the strategic decisions in terms of process as well as for innovation practices. Contrary to the hypothesis, demographic characteristics apart from tenure and age are not key factors of Greek firms' strategic decisions. Finally, the organisational performance is improved by the adoption of financial reporting activities.

Figure 7:2 presents a rehypotherised theoretical framework that has derived after GLM analysis. The study tested the relationships among board attributes, external environments, board involvement, strategic decisions and organisational performance. The findings suggest that in dynamic environments Greek executives prefer the dual leadership structure. A positive relationship was found between organisational characteristics and board characteristics. In particular, organisational size is positively associated with board size and consequently board size with the number of non-executives and executive directors. Board involvement in strategic decision-making was found to be related to a number of inside directors as well as to two formal processes: frequency and duration of board meetings. Strategic decisions are associated with tenure and high level of dynamism in the external environment. Also, product and process innovation strategies have been affected by the external environment as well as the age of the executives. The empirical model derived from GLM analysis showed that only financial reporting activities led to better organisational performance.

Finally, Figure 7:3 is a comprehensive empirical framework that shows that the dynamic and complex environments are the driven forces in strategic decisions with respect to strategic processes as well as choices. In contrast to the hypotheses, Boards of Directors attributes do not have a significant impact on strategic decisions. Organisational performance is significantly related to financial reporting only.

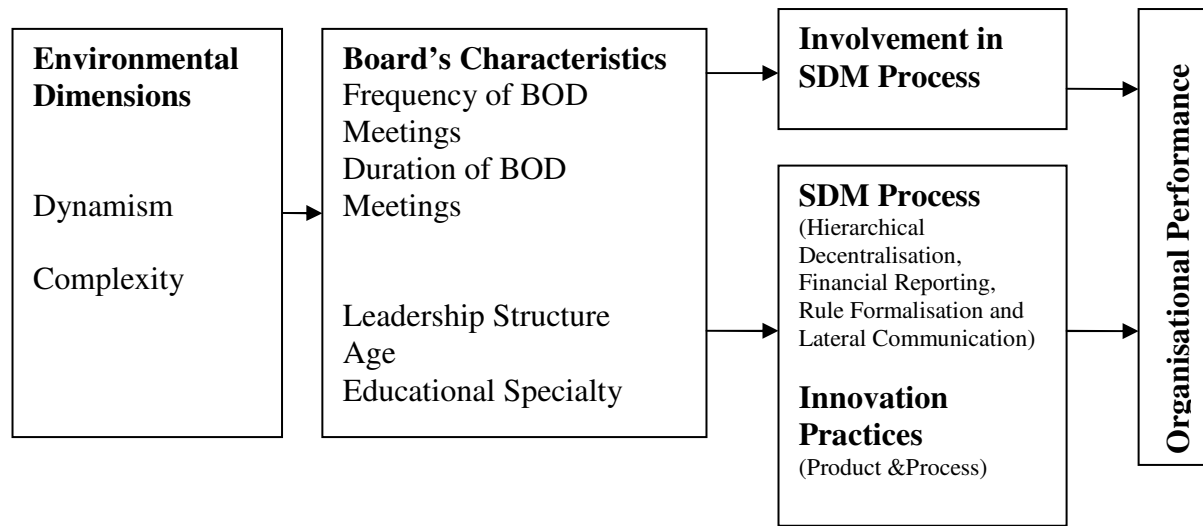


Figure 7:1 Empirical Model Derived from Multiple Regression Analysis

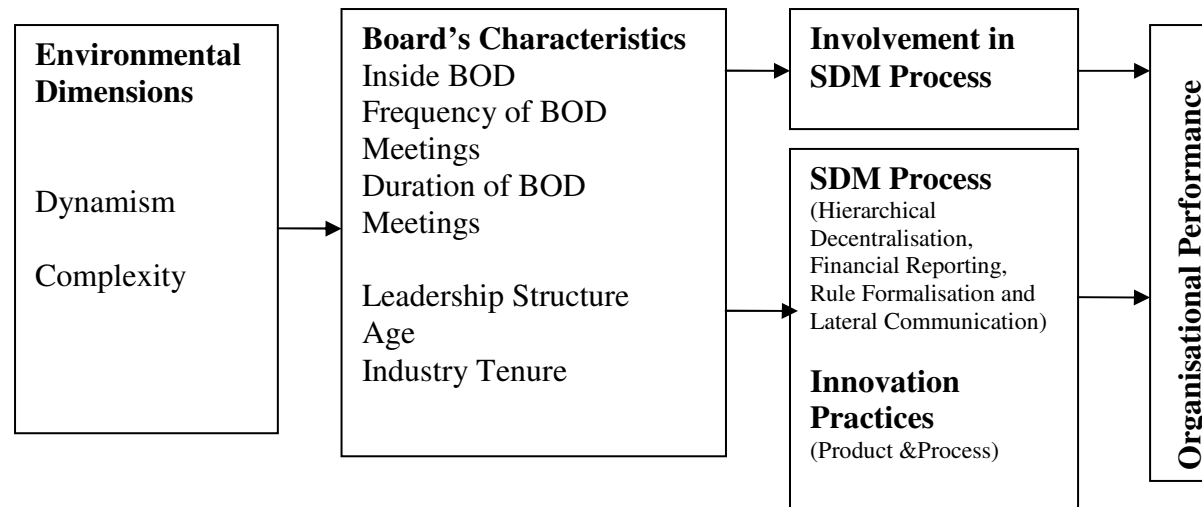


Figure 7:2 Empirical Model Derived from General Linear Model Analysis

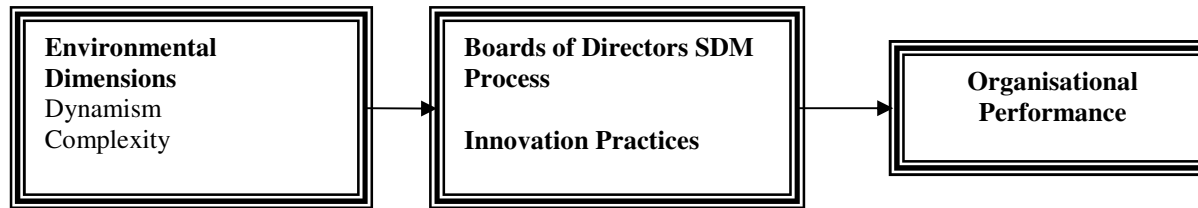


Figure 7:3 Final Empirical Model of the Study: The Influential Factors of Greek Executives' on Board Decision

7.3 Novelty and Contributions

The novelty of the thesis is based on the development of a comprehensive theoretical framework that examines the factors that influence the Boards of Directors' strategic decisions in Greek listed organisations on the Athens Stock Exchange. The theoretical framework is tested for the first time empirically and theoretically. Previous studies that have been conducted in the area of strategic management did not focus on Boards of Directors and failed to establish an association between managerial characteristics and strategic decisions. This study develops an integrative theoretical framework that combines a set of factors that influence the organisational strategy. The study aims to investigate the effects of managerial characteristics along with the environment to both content and process strategy and how they might contribute to organisational performance.

Several contributions emerge from this research. The major theoretical contributions of this thesis are:

First, one of the distinctive contributions is the development of an integrated model based on Hambrick and Mason's upper echelons model, which attempted to depict and explain strategic decision-making processes and the strategic choice of innovation with an outcome to the organisational performance. In the present study, an integrative model was developed that combines factors associated with certain perspectives of board involvement, on the strategic decision-making process and on strategic choice of innovation: (1) environmental dimensions, (2) board structure characteristics and (3) board members demographic characteristics. Most of the previous studies have focused on the strategic decision-making process; this study suggests an integrative model that combines strategic decisions both process and content. This is the first study to the best of our knowledge that combines both the composition and demographic characteristics of board members and investigates their effect on strategic decisions and on innovation policies.

Second, another contribution to knowledge is that it is the first study to report that has valuable data from Greek listed organisations on Athens Stock Exchange. In addition, the study contributed to the limited so far knowledge on how Greek executives pursue strategic decisions and address the questions which are those factors that influence their decisions. The study reports in detail how Greek executives participate in strategic

decisions, the process that they follow to take their decisions and which are those decisions that assist them to improve the organisational performance. It examines the board involvement in strategic decisions, the strategic decision-making process as well the innovation practices of the Greek listed organisations.

The study combines a set of key factors-board composition characteristics, demographic characteristics and environmental dimensions and examines certain characteristics of strategic decision-making processes, namely: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication as well as innovation practices.

Third, it uses a multi-dimensional empirically grounded representation of the strategic decision-making process and on strategic choice of innovation in order to test their effect on performance. In this study, the board is considered as a social construction and board members are understood through their attributes, working styles, and actual board task performance and the processes inside the boardroom. This is an advantage over related empirical efforts which focus on specific process dimensions mainly on rationality (Fredrickson, 1985; Dean and Sharfman, 1993). This study examines the attributes of executives on specific not well examined strategic decision-making processes namely: financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

Fourth, a strong point of the research relates to the fact that it brings empirical evidence from a relatively new cultural context taking into account that most of the studies have taken place in the U.K, U.S.A and Canada. This is the first study reported on strategic decisions on Greek publicly listed companies in the ASE. This is significant in permitting a test of a wider validity of findings derived from research conducted in Anglo-Saxon context.

Fifth, the accessibility to Boards of Directors allowed us to collect really rare and valuable data, since we are not able to attend board meetings and observe how in fact “boards work”. The fact that this study was completed allowed us to draw some general overviews on how Greek Boards of Directors affect the strategic decisions alongside the influence of the external environment. The sample consists of 105 Greek listed organisations with an overall number of approximately 290 companies listed in the Athens Stock Exchange. The sample is regarded as a reasonably representative sample of the Athens Stock market

companies that allowed us to draw some conclusions on how Greek Boards of Directors take their strategic decisions and which individual attributes and composition characteristics affect their strategic choices during various environmental circumstances.

Finally, the results show that the external environmental forces are better predictors of strategic decision-making processes. The findings are novel for a country like Greece. Although we could expect to find that the personal attributes of dominant executives would be influential in the strategic decision-making, the results have shown that the external environment matters more for the strategic decisions of Greek Directors.

7.4 Implications of the Study

7.4.1 Introduction

The research findings of the study have several practical implications. In the section below, specific implications for business practitioners and academics will be highlighted.

7.4.2 Implications for Practitioners

The study offers a few important implications for Greek executives in listed organisations in the ASE. This thesis examined the extent to which certain characteristics of board members and the dimensions of external environment influence the firm's strategic decisions and finally, the organisational performance.

First, it highlighted the importance of external environment to executives' strategic decisions. The results showed that Greek executives pursue their strategic decisions according to the environment that their companies are operating in. When executives perceive the business environment to be either dynamic or complex, they are more likely to integrate certain strategic decision-making characteristics such as financial reporting, rule formalisation, hierarchical decentralisation and lateral communication.

Second, the extent of board participation in the strategic decision-making process is mainly influenced by the duration of board meetings.

Third, Greek executives were found to be proactive and to pursue innovative strategies during dynamic environments. Fourth, financial reporting has an effect on firm's financial performance. Future research should pay more attention to identifying the factors that affect the firm's performance.

Previous results have reported that environmental variables exert the greater influence on strategic decisions (e.g. Hannan and Freeman, 1977; Jemison, 1981). The findings suggested that Greek companies are more responsive to external stimuli and introduce changes in their structures and policies in order to survive. However, when directors perceive the business environment to be either complex or dynamic, they have to develop a proactive environmental strategy by introducing long-term guidelines in order to cope with various environmental dimensions.

In this way, a plan for a sustainable business model will be incorporated that will reduce the effect of the external environment on managerial decisions. Greek listed organisations will become more proactive in their strategic decisions regardless of the influence of external forces. Public policy makers encourage greater proactivity in environmental practices by introducing clear regulations and long-term policies.

These regulations ought to be part of the firms' strategic plans regardless of the various environments in which companies are operating and they will facilitate companies to enhance their effectiveness. Greek directors should act as a linkage between the firm and the external environment and firms, in order to respond to the environment they have to alter the board composition and perform their strategic role.

Organisational directors and stakeholders should have a comprehensive understanding of the external environment in which their firms operate and should be able to determine the types of directors that will be more effective in fulfilling the resource dependency role.

Regarding the demographic characteristics, findings suggest that the executives' attributes do not provide any insight into how Greek executives take their strategic decisions. In particular, regression results suggest that executives with an educational specialty in sciences participate in lower level hierarchical decisions. Findings from GLM analysis recommend that the higher the industry tenure, the upper level hierarchical decisions are taken. Apart from these two significant demographic findings on strategic decisions, the aforementioned composition and demographic attributes have no effect on strategic decisions.

Apparently, Greek executives tend to discount the composition of the board as a significant factor of their strategic decisions. This can be explained by the fact that our sample

consists of large Greek organisations and the decisions are not taken by a single individual but a group of people. Therefore, the demographic characteristics of the board members might be heterogeneous and do not allow us to conclude with the demographic or composition factors that affect strategic decisions.

Finally, it was found that mature managers are less likely to pursue innovative strategies. Old executives, due to the fact that they want to maintain their financial security and their status, they are reluctant to initiate innovation policies. Hence, Greek executives are advised not to appoint mature managers in their organisations who are risk averse and reluctant to organisation changes but to rely more on young executives who have innovative ideas and can bring change to the firm.

Overall, Greek companies, in order to survive and achieve financial prosperity, are forced to adopt a more flexible management style (Bourantas and Papadakis, 1996) that is more like a team-based style of decision making. There are various external forces such as technology, EU membership, expansion of Balkan countries that lead Greek firms to adopt the “*Western-type/professional style of management*”. Furthermore, Greek executives, during complex or unstable environmental circumstances have to be flexible and not to emphasise too much the formality of their decisions but on how to make necessary changes according to the situation that the company faces. Greek Boards of Directors are requested to develop a flexible decision-making process and to adjust their decision according to the current environment (Papadakis, 2006).

7.5 Suggested Avenues for Future Research

Based on the current findings, we would like to point out some avenues for future research.

First, future research should also examine whether different organisational and environmental contexts have an impact on corporate elites’ demographic preferences, structure and composition.

Second, another significant research direction is to treat Boards of Directors as decision-making groups and to encourage researchers to focus on board process and on what boards have to do in order to enhance their effectiveness. It will be beneficial for the executives to discern the factors that influence their strategic decisions and any potential influence on organisational performance.

Third, we have taken into account the lack of large-scale empirical research examining Boards of Directors and strategic decision-making processes, therefore further examination might offer fruitful direction for future research. In addition, a set of demographic characteristics such as heterogeneity, commitment to status quo, power of board members could conclude with more interesting findings.

Fourth, 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 strategic decision-making process 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 a longitudinal research design. Future research using qualitative and longitudinal methods (Kesner and Sebra, 1984), case studies as well as field experiments (Pitcher, Chreim and Kisfalvi, 2000) would be useful in examining the validity of our findings.

Finally, studies on Boards of Directors have so far taken place predominantly in the United States and the U.K, so future research might generate further insights if it were to be implemented in cultural settings where Boards of Directors and corporate governance practices are in their infancy. It will be interesting to investigate how Boards of Directors take strategic decisions in other Balkan countries or less developed European countries such as Poland or Hungary. This will open up a promising research avenue on comparative decision-making practices across different cultural or national settings (Papadakis and Barwise, 1996).

7.6 Concluding Remarks

This chapter presents the conclusions of the study and develops a rehypothetized theoretical framework of the findings of the study that have derived from General Linear Model and multiple regression analyses as they have been reported in Chapters Six of the thesis. Additionally, implications of the study relating to business practice are summarised, aiming at stimulating practitioners to examine strategic decisions from multiple theoretical perspectives. Researchers should not only focus on the demographic and composition characteristics of strategic decisions but also the competitive global environment in which their organisations operate. Finally, it suggests avenues for future research that could provide some useful insights for upper echelons and how they influence firm's strategy.

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APPENDIX A Survey: Pilot Study

“Reflections of Environment and Board of Directors on Strategic Decision-Making Process and on Strategic Choices: A Study of Greek Listed Organisations”

We are collecting information from Greek listed firms in the Athens Stock Exchange on a range of board of directors, strategic decision-making processes as well on strategic choices characteristics. Your cooperation in completing this questionnaire is critical for the success of this research project and it should only take you about 15 minutes of your time. Please answer all the questions as honest and accurate as possible. Please note that there is not “right” or “wrong” answer to any of the questions and it is your first impression and response that we are looking for. The questionnaire has been designed for you to be able either to tick or circle most of the items in order to complete it in the shortest possible time.

ALL THE INFORMATION PROVIDED IN THIS QUESTIONNAIRE WILL REMAIN ABSOLUTELY CONFIDENTIAL AND WOULD BE SEEN ONLY BY THE ACADEMIC RESEARCHERS INVOLVED IN THIS STUDY

Once completed please return the questionnaire in the self-addressed envelop

Maria Elisavet Balta BSc,MSc
Doctoral Researcher
Brunel Business School
BRUNEL UNIVERSITY
Chadwick Building
UB8 2TR, Uxbridge, Middlesex
United Kingdom
E-mail: Maria.Balta@brunel.ac.uk
baltamariliza@yahoo.co.uk

SECTION A: COMPANY'S BACKGROUND

- Q1. Please, indicate how many people does your firm employ
- Q2. Please, indicate the age of the firm.....
- Q3. Please, indicate how many years your firm is listed in the ASE.....
- Q4. In what sector of economic activity is your firm engaged? (check only one)

Oil and Gas		Health Care	
Chemicals		Retail	
Basic Resources		Media	
Construction and Material		Travel and Leisure	
Industrial Goods and Services		Telecommunications	
Food and Beverage		Utilities	
Personal and Household Goods		Banks	
Insurance		Financial Services	
Technology		Other (please specify)	

Q5. What is your approximately annual sales turnover (in Euros).....

SECTION B: BOARD COMPOSITION

- Q6. What is the total number of board members.....
- Q7. What is the number of inside/internal board members
- (As inside/internal board members are defined as those who are employees of your company)
- Q8. What is the number of outside/external board members?.....
- (As outside/external board members are defined those who **are not** employees of the firm)
- Q8a. How many of outside/external board members can be characterised as affiliate?.....
- (As affiliate board members are defined as those that meet **any** of the following conditions: affiliation with your firm as a supplier, banker or creditor within the past two years association with a law firm engaged by your firm, being an employee of your firm's subsidiaries or holding companies or relation by blood/marriage with a member of the board).
- Q8b. How many of the outside /external board members can be characterised as independent? (As independent board members are defined as those who **are both outside/external and not affiliate**).....
- Q9. How many of board members are interlocking?
- (As interlocking is characterised the director that serve simultaneously to more than one boards)

SECTION C: DEMOGRAPHIC CHARACTERITICS OF THE BOARD

Q10. Please, specify your age.....

Q11: Please, indicate your gender:

Male	
Female	

Q12: Please, specify your highest educational attainment:

High-school graduate	
Bachelor’s Degree (equal to National Degree/Greek Ptychion)	
College	
Postgraduate Degree (Master’s)	
Ph.D (Doctorate)	

Q13: Please indicate your highest educational specialty:

Engineering	
Sciences (Physics, Chemistry, etc)	
Business Administration	
Business (Accounting, Finance, HRM, etc)	
Social Sciences-economics-sociology	
Marketing	
Civil Engineering	
Other(please,specify)	

Q14: Please indicate the area which best represents your functional background:

Finance Treasurer		Information Systems	
Human Resource Management		Marketing/ Sales/ Customer Service	
Public Affairs		Operations/Field Service	
General Management		Accounting/ Controller	
Maintenance/Field Service		Other (please, specify)	

Q15: Please, specify the number of years you work in the current industry.....

Q16: Please, specify the number of years you work in current company.....

Q18: Please, specify the number of years you work in this position.....

Q19: Please, specify the number of years you work abroad.....

SECTION D: EXTERNAL CORPORATE ENVIRONMENT

Q20: How you should characterize the external environment within which your company functions?

Environmental Complexity/Homogeneity-Heterogeneity

Market activities of your key competitors:	Have become far more predictable	1 2 3 4 5 6 7	No Change	Have become far Less predictable
--	----------------------------------	---------------	-----------	----------------------------------

The tastes and preferences of your customers in your principal industry:	Have become much more stable and predictable	1 2 3 4 5 6 7	No Change	Have become much more hard to forecast
--	--	---------------	-----------	--

Rate of innovation of new Operating processes and New products or services in Your principal industry:	Rate has fallen dramatically	1 2 3 4 5 6 7	No Change	Rate has dramatically increased
--	------------------------------	---------------	-----------	---------------------------------

Your principal industry's Downswings and upswings:	Have become far more predictable	1 2 3 4 5 6 7	No Change	Have become far less predictable
--	----------------------------------	---------------	-----------	----------------------------------

Market activities of your key competitors:	Have become far more hostile	1 2 3 4 5 6 7	No Change	Have become far less hostile
--	------------------------------	---------------	-----------	------------------------------

Market activities of your key competitors:	Now affect the firm in far fewer areas	1 2 3 4 5 6 7	No Change	Now affect the firm in many more areas (e.g. pricing, delivery, service, quality,etc)
--	--	---------------	-----------	---

Needed diversity in Your production methods and marketing tactics to cater to your different customers:	Diversity has dramatically decreased	1 2 3 4 5 6 7	No Change	Diversity has dramatically increased
---	--------------------------------------	---------------	-----------	--------------------------------------

Environmental Dynamism:
Dynamism in Marketing Practices

Changes in mix of products/brands carried 1 2 3 4 5 6 7

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Changes in sales strategies

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Changes in sales promotion/advertising strategies

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Competitor Dynamism

Changes in competitor's mix of products/brands

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Changes in competitor's sales strategies

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Changes in competitor's sales promotions/advertising strategies

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Customer Dynamism

Changes in customer preferences in product features

1	2	3	4	5	6	7
No Change						Very Frequent Changes

Changes in customer preferences in brands

1	2	3	4	5	6	7
---	---	---	---	---	---	---

No Change Very Frequent Changes

Changes in customer preferences in product quality/price

1	2	3	4	5	6	7
---	---	---	---	---	---	---

No Change Very Frequent Changes

Environment Munificence/Hostility:

Very safe little threat to the survival and well-being of the company	1 2 3 4 5 6 7	Very risky, one false step can mean my company's undoing
Rich in investment and marketing opportunities	1 2 3 4 5 6 7	Very stressful, exacting, hostile; very hard to keep a float
An environment that the company can control and manipulate to its own advantage, such as a dominant firm has in an industry with little competition and few hindrances	1 2 3 4 5 6 7	A dominating environment in which my company's initiatives count for very little against the tremendous political, technological or competitive forces

SECTION F: INVOLVEMENT IN THE STRATEGIC DECISION-MAKING

Q25: Please, indicate to what extent you believe that the board of directors has been involved in the formation and evaluation of the strategic decisions (1=Never, 7=Always):

Formation of New Strategic Decisions

The board is usually not involved with the formation of strategic decisions	1 2 3 4 5 6 7
The board usually ratifies strategic proposals that are formed solely by top management	1 2 3 4 5 6 7
The board usually asks probing questions and then ratifies strategic proposals that are formed primarily by top management	1 2 3 4 5 6 7
The board usually asks probing questions which lead to revisions of strategic proposals that are formed by top management	1 2 3 4 5 6 7
The board usually helps to form strategic decisions with top management in board meetings	1 2 3 4 5 6 7
The board usually helps to form strategic decisions with top management within and between board meetings	1 2 3 4 5 6 7
The board usually forms strategic decisions separate from	1 2 3 4 5 6 7

top management	
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Evaluation of Prior Strategic Decisions

The board is usually not involved with monitoring the progress of strategic decisions	1 2 3 4 5 6 7
The board usually accepts the evaluation given to it by top management without asking probing questions	1 2 3 4 5 6 7
The board usually accepts the evaluation given to it by top management after asking probing questions	1 2 3 4 5 6 7
The board usually determines the timing and criteria of evaluation, but that information is supplied by top management and it is rarely challenged by the board	1 2 3 4 5 6 7
The board usually determines the timing and criteria of evaluation , but that information and it often requests additional information after receiving the progress report from top management	1 2 3 4 5 6 7
The board determines the timing and criteria of evaluation and it is often request additional information after receiving the progress report from top management	1 2 3 4 5 6 7
The board usually collects its own information about the progress of the strategic decision in addition to top management reports	1 2 3 4 5 6 7

Frequency of Board Meetings

Q26: Please, indicate the frequency of the board meetings:

Once a year	Every six months	Quarterly	Every month	Every 15 days	Weekly
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Length of Board Meetings

Q27: Please, indicate the duration of board meetings:

More than two hours	Two hours	One and half hour	One hour	30 minutes	Less than 30 minutes
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SECTION G: STRATEGIC DECISION MAKING PROCESS

Rationality/Comprehensiveness

Q28: Please, indicate what YOUR FIRM would do to determine the cause of the problem To answer the following questions, please check the one choice that *best describes* what would be done in YOUR FIRM.

In your firm *primary* for determining the problem cause would be assigned to (check only one):

- a. No specific individual or group
- b. One specific individual

- c. Two people jointly
- d. An existing committee of three or more
- e. A specially formed group of three or more

In attempting to determine the cause of the problem your firm would (check only one):

- a. Not be willing to rely on outsiders for any assistance
- b. Be willing to rely on one or two outsiders to provide limited assistance
- c. Be willing to rely on one or two outsiders for moderate assistance
- d. Be willing to rely on outsiders significant assistance
- e. Rely entirely on outsiders if necessary

In your firm possible problem causes would be identified primarily through (check one):

- a. The ideas of a single individual
- b. Informal discussions among managers
- c. Scheduled meetings among managers
- d. Scheduled meetings and some analysis
- e. Scheduled meetings and extensive analysis

Approximately how many *employees* would be directly involved in determining the cause of the problem (check only one):

2 or less	3 -4	5-6	7-8	9-10	11-12	More than 12
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Approximately how many years of historical data (e.g. productivity, cost per board foot) would be reviewed to help determine the cause of the problem (check only one):

Less than 1	1	2	3	4	5	More than 5
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Financial Reporting

Q29: Please, indicate the extent to which you believe that your firm pursue the following financial reporting activities in the strategic decision- making process (1=Strongly disagree, 7= Strongly agree).

Use of internal rate of return (IRR) as capital budgeting method	1	2	3	4	5	6	7
Use of net present value as capital budgeting methods	1	2	3	4	5	6	7
Inclusion of proforma financial statements	1	2	3	4	5	6	7
Detailed cost studies	1	2	3	4	5	6	7
Incorporation of strategic decision	1	2	3	4	5	6	7

Rule Formalisation

Q30: Please, indicate the extent to which you believe that your organisation follows the following rule formalisation procedures in the strategic decision-making process (1=Strongly disagree, 7= Strongly agree).

Written procedures guiding the process	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

Formal procedures to identify alternative ways of action	1 2 3 4 5 6 7
Formal screening procedures	1 2 3 4 5 6 7
Formal documents guiding the final decision	1 2 3 4 5 6 7
Predetermined criteria for strategic decision evaluation	1 2 3 4 5 6 7

Hierarchical Decentralisation

Q31: Please, indicate to what extent the following individuals or groups participate in the strategic decision- making process (1=no involvement, 7= active involvement and influence).

Owner-main shareholder	1 2 3 4 5 6 7
Chief Executive Officer	1 2 3 4 5 6 7
First level directors	1 2 3 4 5 6 7
Middle management	1 2 3 4 5 6 7
Lower management	1 2 3 4 5 6 7

Lateral Communication

Q32: Please, indicate to what extent that the following departments of your firm are involved in the strategic decision- making process (1=no involvement, 7= active involvement and influence).

Finance-Accounting	1 2 3 4 5 6 7
Production	1 2 3 4 5 6 7
Marketing-Sales	1 2 3 4 5 6 7
Personnel	1 2 3 4 5 6 7
Purchasing	1 2 3 4 5 6 7

Politicisation

Q33: Please, indicate the extent to which you believe that your organisation follows the following politicisation procedures in the strategic decision-making process (1= Strongly disagree, 7= Strongly agree).

Coalition formation	1 2 3 4 5 6 7
Negotiation taking place among major participants	1 2 3 4 5 6 7
External resistance encountered	1 2 3 4 5 6 7
Process interruptions	1 2 3 4 5 6 7

Problem-Solving Dissension

Q34: Please, indicate the degree of problem –solving dissension during the initial stages of the process: disagreement that you believe that your organisation faces during the following actions (1= Strongly disagree, 7= Strongly agree).

Objectives sought by the decision	1 2 3 4 5 6 7
Proper methodology to follow	1 2 3 4 5 6 7
Problem solution to the problem	1 2 3 4 5 6 7

SECTION: INNOVATION

Q34: Please, indicate the extent to which your organisation pursues the following innovation practices (from 1: no emphasis to 7: extreme emphasis)

Product Innovation

Being the first company in the industry to introduce new products	1 2 3 4 5 6 7
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Creating new products for fast market introduction	1 2 3 4 5 6 7
Creating new variations to existing product lines	1 2 3 4 5 6 7
Increasing the revenue from new products less than 3 years old	1 2 3 4 5 6 7

Process Innovation

Being the first company in the industry to introduce new technology	1 2 3 4 5 6 7
Being the first company in the industry to introduce technological improvements	1 2 3 4 5 6 7
Creating innovative technologies	1 2 3 4 5 6 7
Investing heavily in cutting edge process technology-oriented R&D	1 2 3 4 5 6 7
Developing radical new technology	1 2 3 4 5 6 7

Organisational Innovation

Developing systems that encourage initiatives and creativity among employees	1 2 3 4 5 6 7
Encouraging innovation in the organisation	1 2 3 4 5 6 7
Supporting an organisational unit that drive innovation	1 2 3 4 5 6 7

SECTION : COMPANY'S FINANCIAL PERFORMANCE

Q35: This section is concerned with the performance of your firm in the past five years. To the best of your knowledge, please: Circle the number **best estimating** how YOUR FIRM **compared to close competitors** in your industry on each item.

1. After-tax return on total assets:

1	2	3	4	5
Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%

2. After-tax return on total sales:

1	2	3	4	5
Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%

3. Firm's total sales growth:

1	2	3	4	5
Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%

4. Overall firm performance and success:

1	2	3	4	5
Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%

5. Our competitive position:

1	2	3	4	5
Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%

APPENDIX B: Survey Questionnaire in English

To Whom It May Concern:
Dear Sir/ Madam,

RE: “The Impact of the Corporate Environment and the Board of Directors on the Strategic Decision-Making Process and on Strategic Choices: A Study of Greek Stock Exchange Listed Organisations”

We are conducting a survey on the Corporate Governance practices in Greece and especially on the Boards of Directors of companies listed in the Greek Stock Exchange, with the support of the Brunel Business School. The purpose of the study is to examine the corporate environmental dimensions associated with the board of directors of a firm and the impact of the board of directors and its demographic characteristics on the strategic decision-making processes, as well as on the strategic choices of innovation and diversification.

Your co-operation is critical to the success of the project. Thus, we would be grateful if you could kindly complete the enclosed questionnaire, which does not require more than fifteen minutes.. Please note, that there are no “right” or “wrong” answers to any of these questions, so answer all questions as spontaneously as possible.

This research is strictly confidential and is being carried out for academic purposes only. Your replies will be treated with confidentiality and nobody will be able to identify any individual or firm in the final report.

In return for your cooperation, a summary of the findings will be provided to you after the project is finalized. In addition, we will be delighted to discuss our findings with you if this could be beneficial to your organisation.

A self-addressed envelope is enclosed for the reply. **All replies will be treated as strictly confidential.**

We would be extremely grateful if you could return this questionnaire to us as soon as possible.

Thank you for your time and co-operation.

Yours sincerely,

Maria Elisavet Balta
Doctoral Researcher
Maria.Balta@brunel.ac.uk
baltamariliza@yahoo.co.uk

**“The Impact of the Corporate Environment and the Board of Directors
on the Strategic Decision-Making Process and on Strategic Choices: A
Study of Greek Stock Exchange Listed Companies”**

We are collecting information from Greek firms, listed in the Athens Stock Exchange, on a range of board of director's strategic decision-making processes, as well as on strategic choices characteristics. Your cooperation in completing this questionnaire is critical for the success of this research project and it should only take about 15 minutes of your time. Please, answer all the questions as honestly and accurately as possible. The questions are designed to avoid sensitive or confidential issues. However, if you do not wish to answer any particular question, please feel free to move to the next one. Please note, that there is not "right" or "wrong" answer to any of the questions and it is your first impression and response that we are looking for. The questionnaire has been designed to allow you to either tick or circle most of the items, in order to complete it in the shortest possible time.

*ALL THE INFORMATION PROVIDED IN THIS QUESTIONNAIRE WILL REMAIN
ABSOLUTELY CONFIDENTIAL AND WOULD BE SEEN ONLY BY THE ACADEMIC
RESEARCHERS INVOLVED IN THIS STUDY*

Once completed please return the questionnaire in the self-addressed envelope.

Maria Elisavet Balta BSc,MSc
Doctoral Researcher
Brunel Business School
BRUNEL UNIVERSITY
Chadwick Building
UB8 3PH, Uxbridge, Middlesex
United Kingdom
E-mail: Maria.Balta@brunel.ac.uk
baltamariliza@yahoo.co.uk

SECTION A: COMPANY'S BACKGROUND (Questions 1-5)

In this section, please provide us with background information regarding your company.

Q1: What is the number of full-time employees working in your company?

Q2: What year your company was established?

Q3: What year your company entered the Athens Stock Exchange?

Q4: In what sector of economic activity is your firm engaged? (check only one)

Oil and Gas..... Health Care.....

Chemicals..... Retail.....

Basic Resources..... Media.....

Construction and Material..... Travel and Leisure.....

Industrial Goods & Services..... Telecommunications.....

Food & Beverages..... Utilities.....

Personal & Household Goods..... Banks.....

Insurance..... Financial Services.....

Technology..... Other (*please specify*).....

Q5: Please fill in the table below by indicating the annual sales turnover and the annual sales turnover domestically in Euros and by indicating the annual sales turnover per market segment % domestically and internationally approximately:

Annual sales turnover (€)					
Domestic sales turnover (€)					
Markets	1	2	3	4	5
Market segment (i.e food, insurance, etc)					
Domestic sales (%)					
International sales (%)					

SECTION B: BOARD COMPOSITION (Questions 6-11)

In this section, please provide us with some information regarding your company's board of directors composition

Q6: What is the total number of board members ?

Q7: What is the number of inside/internal board members ?

Q8: How many of the outside /external board members can be characterised as independent?

Q9: How many of board members are interlocking?

(Interlocking are characterised the board members that join more than two boards)

Q10: The positions of CEO and Chairman are held by the same person? YES NO

Q11: Please, indicate the number of female board members

SECTION C: DEMOGRAPHIC CHARACTERISTICS OF THE BOARD (Questions 12-20)

In this section, please provide us with some information regarding your personal demographic characteristics.

Q12: Please, specify your age.

Q13: Please, indicate your gender:

Male

Female

Q14: Please, specify your highest educational degree.

- High-school graduate.....
- Bachelor's Degree (equal to National Degree/Greek Ptychion).....
- Postgraduate Degree (Master's).....
- PhD (Doctorate).....

Q15: Please, indicate your highest educational specialty.

- Engineering.....
- Sciences (Physics, Chemistry, etc).....
- Business Administration.....
- Business (Accounting, Finance, HRM, etc).....
- Social Sciences-economics-sociology.....
- Marketing.....
- Civil Engineering.....
- Other (please, specify).....

Q16: Please, indicate the area which best represents your functional background.

- | | | | |
|--------------------------------|--------------------------|--------------------------------------|--------------------------|
| Finance Treasurer..... | <input type="checkbox"/> | Information Systems..... | <input type="checkbox"/> |
| Human Resource Management..... | <input type="checkbox"/> | Marketing/ Sales/ Customer Service.. | <input type="checkbox"/> |
| Public Affairs..... | <input type="checkbox"/> | Operations/Field Service..... | <input type="checkbox"/> |
| General Management..... | <input type="checkbox"/> | Accounting/Controller..... | <input type="checkbox"/> |
| Maintenance/Field Service..... | <input type="checkbox"/> | Other(please, specify)..... | <input type="checkbox"/> |

Q17: Please, specify the number of years you work in the current industry.

Q18: Please, specify the number of years you work in current company.

Q19: Please, specify the number of years you work in this position.

Q20: Please, specify the number of years you have worked abroad.

SECTION D: EXTERNAL CORPORATE ENVIRONMENT (Question 21)

In this section, please provide us with information regarding the external environment in which your firm operates

Q 21: Please, indicate the extent to which you believe that your firm operates under the following environmental circumstances (1=Strongly disagree, 7= Strongly agree).

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
Predictability in the market activities of your key competitors in your sector	1	2	3	4	5	6	7
Predictability in the tastes and preferences of your customers in your principal industry during the recent years	1	2	3	4	5	6	7
Increase in the innovation rate of new operating processes and new products or services in your principal industry	1	2	3	4	5	6	7
Hostility in the market activities of your key competitors	1	2	3	4	5	6	7
Influence of the market activities from your key competitors	1	2	3	4	5	6	7
Increase in the needed diversity in your production methods and marketing tactics to cater your different customers	1	2	3	4	5	6	7
Changes in the mix of products/brands carried	1	2	3	4	5	6	7
Changes in the sales strategies	1	2	3	4	5	6	7
Changes in the sales promotion/advertising strategies	1	2	3	4	5	6	7
Changes in the competitor's mix of products/brands	1	2	3	4	5	6	7
Changes in the competitor's sales strategies	1	2	3	4	5	6	7
Changes in the competitor's sales promotions/advertising strategies	1	2	3	4	5	6	7
Changes in the customer preferences of the product features	1	2	3	4	5	6	7
Changes in the customer preferences of the brands	1	2	3	4	5	6	7
Changes in the customer preferences of the product quality/price	1	2	3	4	5	6	7
Little threat to the survival and well-being of the company	1	2	3	4	5	6	7
Rich in investment and marketing opportunities	1	2	3	4	5	6	7
An environment that the company can control and manipulate to its own advantage, such as a dominant firm has in an industry with little competition and few hindrances	1	2	3	4	5	6	7

SECTION E: THE BOARD'S INVOLVEMENT IN THE STRATEGIC DECISION – MAKING Process (Question 22)

In this section, we seek information of the involvement of your Boards of Directors in your company's overall strategy.

Q 22: Please, indicate the extent to which you believe that the board of directors participates in the formation and the evaluation of your company's strategic decisions (1=Strongly disagree, 7=Strongly agree)

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
<i>Formation of New Strategic Decisions</i>							
The board is not usually involved with the formation of the strategic decisions	1	2	3	4	5	6	7
The board usually ratifies strategic proposals which are formed solely by the top management	1	2	3	4	5	6	7
The board usually asks probing questions and then ratifies strategic proposals formed primarily by the top management	1	2	3	4	5	6	7
The board usually asks probing questions which lead to revisions of strategic proposals formed by the top management	1	2	3	4	5	6	7
The board usually helps to form strategic decisions with the top management in board meetings	1	2	3	4	5	6	7
The board usually helps the top management to form strategic decisions within and between board meetings	1	2	3	4	5	6	7
The board usually forms the strategic decisions separately from the top management	1	2	3	4	5	6	7
<i>Evaluation of Prior Strategic Decisions</i>							
The board is not usually involved with the monitoring of the progress of strategic decisions	1	2	3	4	5	6	7
The board usually accepts the evaluation of strategic decisions by the top management without asking probing questions	1	2	3	4	5	6	7
The board usually accepts the evaluation of strategic decisions by top management after asking probing questions	1	2	3	4	5	6	7
The board usually determines the timing and criteria of the evaluation, but that information is supplied by the top management and it is rarely challenged by the board	1	2	3	4	5	6	7
The board usually determines the timing and criteria of the evaluation and often requests additional information after receiving the progress report from the top management	1	2	3	4	5	6	7
The board usually collects its own information about the progress of the strategic decision, in addition to the top management reports	1	2	3	4	5	6	7

Q23. Please, indicate the frequency of the board meetings

- One a year Quarterly Every 15 days
Every six months Every month Weekly

Q24. Please, indicate the duration of board meetings

- More than two hours One and a half hour 30 minutes
Two hours One hour Less than 30 minutes

SECTION F: STRATEGIC DECISION - MAKING PROCESS (Questions 25-31)

In this section, we seek information on the activities which your Board of Directors pursues in the strategic decision-making process.

Q25: In your firm, the responsibility of determining the cause of a problem would be assigned to (check only one):

- a. No specific individual or group
 b. One specific individual
 c. Two people jointly
 d. An existing committee of three or more employees
 e. A specially formed group of three or more employees

Q26: In attempting to determine the cause of a problem, your firm would (check only one):

- a. Not be willing to rely on outsiders for any assistance
 b. Be willing to rely on one or two outsiders to provide limited assistance
 c. Be willing to rely on one or two outsiders for moderate assistance
 d. Be willing to rely on outsiders for significant assistance
 e. Rely entirely on outsiders if necessary

Q27: In your firm, possible problem causes would be identified primarily through (check only one):

- a. The ideas of a single individual
 b. Informal discussions among managers
 c. Scheduled meetings among managers
 d. Scheduled meetings and some analysis
 e. Scheduled meetings and extensive analysis

Q28: How many *employees* approximately would be directly involved in determining the cause of a problem (check only one):

- Two or less Five to six Nine to ten More than twelve
Three to four Seven to eight Eleven to twelve

Q29: How many years of historical data approximately (e.g. productivity, cost per board foot) would be reviewed to help determine the cause of a problem in your firm (check only one):

- Less than one Two Four More than five
One Three Five

Q30: Please, indicate the extent to which you believe that your firm pursues the following activities in the strategic decision- making process (1=Strongly disagree, 7= Strongly agree).

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
<u>Financial Reporting</u>							
Use of internal rate of return (IRR) as capital budgeting method	1	2	3	4	5	6	7
Use of net present value as capital budgeting method	1	2	3	4	5	6	7
Inclusion of pro-forma financial statements	1	2	3	4	5	6	7
Detailed cost studies	1	2	3	4	5	6	7
Incorporation of strategic decision	1	2	3	4	5	6	7
<u>Rule Formalisation</u>							
Written procedures guiding the process	1	2	3	4	5	6	7
Formal procedures to identify alternative ways of action	1	2	3	4	5	6	7
Formal screening procedures	1	2	3	4	5	6	7
Formal documents guiding the final decision	1	2	3	4	5	6	7
Predetermined criteria for strategic decision evaluation	1	2	3	4	5	6	7

	No Involvement	Very Low Involvement	Low Involvement	Moderate Involvement	Involvement	High Involvement	Active Involvement
<u>Hierarchical Decentralisation</u>							
Owner/Shareholders	1	2	3	4	5	6	7
Chief Executive Officer	1	2	3	4	5	6	7
First level directors	1	2	3	4	5	6	7
Middle level management	1	2	3	4	5	6	7
Lower level management	1	2	3	4	5	6	7
<u>Lateral Communication</u>							
Finance-Accounting department	1	2	3	4	5	6	7
Production department	1	2	3	4	5	6	7
Personnel department	1	2	3	4	5	6	7
Purchasing department	1	2	3	4	5	6	7

Q31: Please, indicate to what extent the following individuals/ groups or departments participate in the strategic decision-making process in your firm (1=No involvement, 7= Active involvement).

SECTION G: INNOVATION (Question 32)

In this section, we seek information on the innovative activities of your Board of Directors pursues.

Q32: Please, indicate the extent to which your organisation emphasise on the following innovation practices (from 1: No emphasis to 7: Extreme emphasis).

	No Emphasis	Very Low Emphasis	Low Emphasis	Moderate Emphasis	Emphasis	A Lot of Emphasis	Extreme Emphasis
Product Innovation							
Being the first company in the industry to introduce new products/services	1	2	3	4	5	6	7
Creating new products for fast market introduction	1	2	3	4	5	6	7
Creating new variations to existing product lines	1	2	3	4	5	6	7
Increasing the revenue from less than 3 years old new products	1	2	3	4	5	6	7
Process Innovation							
Being the first company in the industry to introduce new technology	1	2	3	4	5	6	7
Being the first company in the industry to introduce technological improvements	1	2	3	4	5	6	7
Creating innovative technologies	1	2	3	4	5	6	7
Investing heavily in cutting edge process technology-oriented R&D	1	2	3	4	5	6	7
Developing radical new technology	1	2	3	4	5	6	7
Organisational Innovation							
Developing systems that encourage initiatives and creativity among employees	1	2	3	4	5	6	7
Encouraging innovation in the organisation	1	2	3	4	5	6	7
Supporting an organisational unit that drive innovation	1	2	3	4	5	6	7

SECTION H: COMPANY'S FINANCIAL PERFORMANCE (Question 33)

In this section, we seek information on your firm's performance during the last five years.

Q33: Please, circle in each category the number estimating to the best of your knowledge how your company compares to its close competitors in your industry.

	Lowest 20%	Lower 20%	Middle 20%	Next 20%	Top 20%
After-tax return on total assets	1	2	3	4	5
After-tax return on total sales	1	2	3	4	5
Firm's total sales growth	1	2	3	4	5
Overall firm performance and success	1	2	3	4	5
Our competitive position	1	2	3	4	5

If you would like to make any comments regarding any of the items included in the questionnaire, please write them in the space provided below.

Do you wish to receive a complementary copy of results of this study? Yes No

Please note that this code is included to avoid sending you unnecessary reminders

Please attach your business card in order to receive a complementary copy of the study results.

Business Card

THANK YOU FOR YOUR PARTICIPATION IN THIS STUDY

Please return this completed questionnaire in the self-addressed envelope provided.

All information in this questionnaire will remain absolutely confidential and will be seen only by academic researchers involved in this study.

APPENDIX C: Survey Questionnaire in Greek

Θέμα : « *Ο Ρόλος του Επιχειρηματικού Περιβάλλοντος και των μελών του Διοικητικού Συμβουλίου στη διαδικασία λήψης στρατηγικών αποφάσεων και στις στρατηγικές επιλογές: Έρευνα των Ελληνικών Εταιριών εισηγμένων στο ΧΑΑ*».

Αξιότιμοι κύριοι,

Διεξάγουμε μια μελέτη με την υποστήριξη του Τμήματος Οργάνωσης & Διοίκησης του Πανεπιστημίου Brunel (Λονδίνο), πάνω στις πρακτικές της Εταιρικής Διακυβέρνησης στην Ελλάδα και ιδιαίτερα των μελών του Διοικητικού Συμβουλίου εισηγμένων στο χρηματιστήριο εταιριών. Η έρευνα μας αποσκοπεί στην εξέταση της επίδρασης του επιχειρηματικού περιβάλλοντος (σε σχέση με τα μέλη του Διοικητικού Συμβουλίου) των εισηγμένων στο ΧΑΑ εταιριών, καθώς και της επίδρασης των διοικητικών μελών και των δημογραφικών τους χαρακτηριστικών στη λήψη στρατηγικών διοικητικών αποφάσεων και επιλογών, πάσης φύσεως καινοτομιών και διαφοροποιήσεων.

Η συμμετοχή σας στην ανωτέρω έρευνα κρίνεται καθοριστική για την επιτυχή έκβασή της. Παίρνοντας λοιπόν αυτή την πρωτοβουλία, σας αποστέλλουμε το επισυναπτόμενο ερωτηματολόγιο που δημιουργήθηκε για τους λόγους που προαναφέρθηκαν, εκφράζοντας συγχρόνως θερμά την παράκληση να το συμπληρώσετε, διότι χωρίς την πολύτιμη βοήθειά σας θα είναι αδύνατη η όποια ορθή αντιμετώπιση του ερευνώμενου ζητήματος. Η συμπλήρωση του επισυναπτόμενου ερωτηματολογίου δεν θα απαιτήσει πάνω από δεκαπέντε λεπτά του πολύτιμου χρόνου σας.

Παρακαλώ να απαντήσετε αυθόρμητα, λαμβάνοντας υπόψη ότι δεν υπάρχουν σωστές ή λάθος απαντήσεις σε καμία από τις ερωτήσεις. Η έρευνα είναι αυστηρά εμπιστευτική και διεξάγεται καθαρά για ακαδημαϊκούς σκοπούς και για το λόγο αυτό οι απαντήσεις σας θα επεξεργαστούν με εμπιστευτικότητα και κανένας δεν θα είναι σε θέση να προσδιορίσει την ταυτότητα του συμμετέχοντος προσώπου ή οργανισμού στην τελική έκθεση. Σε ανταπόδοση της συνεργασίας σας θα σας σταλεί περίληψη των αποτελεσμάτων μετά το πέρας της μελέτης. Επίσης, ευχαρίστως θα συζητούσαμε μαζί σας τα αποτελέσματα της έρευνας μας, αν αυτό το κρίνετε χρήσιμο για την εταιρία/οργανισμό σας. Εκτιμώντας τον περιορισμένο χρόνο σας, σας παρακαλούμε να επιστρέψετε το επισυναπτόμενο ερωτηματολόγιο συμπληρωμένο το συντομότερο δυνατό.

Ευχαριστούμε εκ των προτέρων για την πολύτιμη βοήθειά σας και τη συνεργασία σας.

Με τιμή

Διδακτορική ερευνήτρια
Μαρία –Ελισάβετ Μπαλτά

Ο Ρόλος του Επιχειρηματικού Περιβάλλοντος και των μελών του Διοικητικού Συμβουλίου στη διαδικασία λήψης στρατηγικών αποφάσεων και στις στρατηγικές επιλογές

Στα πλαίσια της έρευνας που διεξάγουμε με την υποστήριξη του Τμήματος Οργάνωσης & Διοίκησης του Πανεπιστημίου Brunel (Λονδίνο), συγκεντώνουμε πληροφορίες Ελληνικών εταιρών εισηγμένων στο Χρηματιστήριο Αξιών Αθηνών, εστιάζοντας στη διαδικασία λήψης στρατηγικών αποφάσεων του Διοικητικού Συμβουλίου καθώς και στα χαρακτηριστικά των στρατηγικών τους επιλογών.

Κρίνουμε απαραίτητη τη συνεργασία σας για τη συμπλήρωση αυτού του ερωτηματολογίου που δεν απαιτεί άνω των 15 λεπτών από τον πολύτιμο χρόνο σας και αποτελεί βάση για την ομαλή έκβαση της έρευνάς μας. Παρακαλώ να απαντήσετε σε όλες τις ερωτήσεις με ειλικρίνεια και σαφήνεια. Οι ερωτήσεις έχουν σχεδιαστεί με τέτοιο τρόπο ώστε να μην θίγουν ευαίσθητα ή εμπιστευτικά ζητήματα. Παρολαυτά, αν δεν επιθυμείτε να απαντήσετε σε κάποια από τις ερωτήσεις προχωρήστε στην επόμενη. Σημειώσατε δε, ότι δεν υπάρχουν σωστές ή λάθος απαντήσεις, αλλά η πρώτη σας εντύπωση πάνω στη θεματολογία και η απάντησή σας είναι αυτό που ζητάμε. Η σχεδίαση του ερωτηματολογίου έχει γίνει με τέτοιο τρόπο ώστε να σας επιτρέπει το μαρκάρισμα ή το κύκλωμα των διακριτικών στοιχείων του.

Οι πληροφορίες που θα μας διαθέσετε θα χρησιμοποιηθούν εμπιστευτικά από την ομάδα ερευνητών που ασχολείται με την ανωτέρω έρευνα.

Παρακαλώ όπως επιστρέψετε το ερωτηματολόγιο στο φάκελο που εσωκλείεται.

Μαρία – Ελισάβετ Μπαλτά
Διδακτορική ερευνήτρια
Brunel Business School
BRUNEL UNIVERSITY
Chadwick Building
UB8 3PH, Uxbridge, Middlesex
United Kingdom
E-mail: Maria.Balta@brunel.ac.uk
baltamariliza@yahoo.co.uk

ΜΕΡΟΣ Α: ΙΣΤΟΡΙΚΟ ΤΗΣ ΕΤΑΙΡΙΑΣ (Ερωτήσεις 1-5)

Σε αυτό το τμήμα παρακαλούμε αναφέρατε πληροφορίες σχετικά με το ιστορικό της εταιρίας.

E1: Αριθμός των υπαλλήλων με πλήρες ωράριο

E2: Ποια η χρονολογία ίδρυσης της εταιρίας σας;

E3: Ποια η χρονολογία εισαγωγής της εταιρίας σας στο ΧΑΑ;

E4: Σε ποιο τομέα οικονομικής δραστηριότητας ανήκει η εταιρία σας (σημειώστε μόνο ένα)

Πετρέλαιο & Αέριο..... Υγεία..... Χημικά..... Εμπόριο..... Πρώτες Ύλες..... Μέσα Ενημέρωσης..... Κατασκευαστική..... Ταξίδια & Αναψυχή..... Βιομηχανικά Πρ. & Υπηρεσίες..... Τηλεπικοινωνίες..... Τρόφιμα & Ποτά..... Υπηρεσίες Κοινής Ωφέλειας..... Προσωπικά & Οικιακά Αγαθά..... Τράπεζες..... Ασφαλιστικά..... Χρηματοοικονομικές Υπηρεσίες..... Τεχνολογία..... Λοιπά (προσδιορίστε).....

E5: Παρακαλώ αναγράψατε στο παρακάτω πίνακα τον ετήσιο κύκλο εργασιών και τον εγχώριο κύκλο εργασιών σε €, και αναφέρατε σε ποσοστά (%) επίσης τον εγχώριο ετήσιο κύκλο εργασιών ανά τομέα και τον διεθνή ετήσιο κύκλο εργασιών ανά τομέα:

Ετήσιο κύκλο εργασιών (€)					
Εγχώριο κύκλο εργασιών (€)					
Τομείς	1	2	3	4	5
Τομείς υπηρεσιών/ προϊόντων (λ.χ. τρόφιμα, ασφάλειες, κτλ)					
Εγχώριες πωλήσεις (%)					
Διεθνείς πωλήσεις (%)					

ΜΕΡΟΣ Β: ΣΥΣΤΑΣΗ ΤΟΥ ΔΙΟΙΚΗΤΙΚΟΥ ΣΥΜΒΟΥΛΙΟΥ (Ερωτήσεις 6-11)

Σε αυτό το τμήμα παρακαλούμε να μας παράσχετε πληροφορίες σχετικά με τη σύνθεση του Δ.Σ

E6: Από πόσα μέλη απαρτίζεται το Διοικητικό Συμβούλιο της εταιρίας;

E7: Ποιος ο αριθμός των εσωτερικών μελών του Διοικητικού Συμβουλίου;

E8: Πόσα από τα μέλη του Διοικητικού Συμβουλίου είναι ανεξάρτητα;

E9: Πόσα από τα μέλη του Διοικητικού Συμβουλίου είναι αλληλοσυνδεδεμένα;

(Αλληλοσυνδεδεμένα χαρακτηρίζονται τα μέλη του Δ.Σ που είναι μέλη περισσότερα από δυο Δ.Σ)

E10: Η θέση του Διευθ/ντος Συμβούλου και του Προέδρου κατέχονται από το ίδιο άτομο **Ναι/Όχι**

E11: Ποιος ο αριθμός των γυναικών που είναι μέλη του Δ.Σ;

ΜΕΡΟΣ Γ: ΔΗΜΟΓΡΑΦΙΚΑ ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΤΩΝ ΜΕΛΩΝ ΤΟΥ Δ.Σ (Ερωτήσεις 12-20)

Σε αυτό το τμήμα παρακαλώ δώστε μας πληροφορίες σχετικά με τα δημογραφικά χαρακτηριστικά σας.

E12: Παρακαλώ να δηλώσετε την ηλικία σας.

E13: Παρακαλώ να δηλώσετε το φύλο σας: Άρρεν

Θήλυ

E14: Παρακαλώ να δηλώσετε την υψηλότερη εκπαιδευτική σας βαθμίδα.

Απόφοιτος Λυκείου.....

Πτυχιούχος ΑΕΙ/ΤΕΙ

Μεταπτυχιακός τίτλος (Μάστερ).....

Διδακτορικός τίτλος.....

E15: Παρακαλώ να δηλώσετε την εκπαιδευτική σας εξειδίκευση.

Μηχανικός

Επιστήμες (Φυσική,Χημεία κλπ).....

Οργάνωση & Διοίκηση Επιχειρήσεων.....

Επιχειρήσεις (Λογιστικά, Χρηματοοικονομικά, Ανθρώπινοι Πόροι,κλπ).....

Κοινωνικές Επιστήμες-οικονομικά-κοινωνιολογία.....

Μάρκετινγκ.....

Πολιτικοί Μηχανικοί.....

Άλλο (αναφέρατε).....

E16: Παρακαλώ δηλώστε το αντικείμενο που σας αντιπροσωπεύει καλύτερα στη λειτουργία της εταιρίας σας

Ταμίας..... Συστήματα Πληροφορικής.....

Διοίκηση Ανθρώπινων Πόρων..... Τμήμα Πωλήσεων.....

Δημόσιες Σχέσεις..... Οικοδομικές Επιχειρήσεις.....

Μάνατζμεντ..... Λογιστική.....

Συντήρηση..... Άλλο (προσδιορίστε).....

E17: Παρακαλώ να προσδιορίσετε τα έτη εργασίας σας στο τρέχον αντικείμενο

E18: Παρακαλώ να προσδιορίσετε τα έτη εργασίας σας στην παρούσα εταιρία.

E19: Παρακαλώ να προσδιορίσετε τα έτη εργασίας σας στην παρούσα θέση.

E20: Παρακαλώ να προσδιορίσετε τα έτη που εργαστήκατε στο εξωτερικό.

ΜΕΡΟΣ Δ: ΕΞΩΤΕΡΙΚΟ ΠΕΡΙΒΑΛΛΟΝ (Ερώτηση 21)

Σε αυτό το τμήμα παρακαλούμε να δώσετε πληροφορίες σχετικά με το επιχειρηματικό περιβάλλον της εταιρίας σας.

Ε 21: Παρακαλώ να προσδιορίσετε το βαθμό που πιστεύεται ότι η εταιρία σας λειτουργεί κάτω από τις ακόλουθες εξωτερικές συνθήκες περιβάλλοντος (1=Διαφωνώ απόλυτα, 7= Συμφωνώ απόλυτα).

	Διαφωνώ απόλυτα	Διαφωνώ	Μερικώς διαφωνώ	Ούτε συμφωνώ ούτε διαφωνώ	Μερικώς συμφωνώ	Συμφωνώ	Συμφωνώ απόλυτα
Προβλεψιμότης των δραστηριοτήτων στην αγορά των βασικών ανταγωνιστών του κλάδου.	1	2	3	4	5	6	7
Προβλεψιμότης των προτιμήσεων των καταναλωτών στον κύριο κλάδο δραστηριότητας σας τα τελευταία χρόνια.	1	2	3	4	5	6	7
Αύξηση του βαθμού καινοτομίας στις μεθόδους λειτουργίας των νέων προϊόντων ή υπηρεσιών στο κύριο κλάδο δραστηριότητας σας.	1	2	3	4	5	6	7
Αντιπαλότητα των δραστηριοτήτων στην αγορά των βασικών ανταγωνιστών του κλάδου.	1	2	3	4	5	6	7
Επιρροή στην αγορά των δραστηριοτήτων σας των βασικών ανταγωνιστών του κλάδου.	1	2	3	4	5	6	7
Αύξηση της ανάγκης διαφοροποίησης των μεθόδων παραγωγής και των τρόπων διαφήμισης με σκοπό την προσέγγιση διαφορετικού καταναλωτικού κοινού. Αλλαγές στο μείγμα των προϊόντων/μάρκες.	1	2	3	4	5	6	7
Αλλαγές στη στρατηγική των πωλήσεων.	1	2	3	4	5	6	7
Αλλαγές στην προώθηση των πωλήσεων/στρατηγική διαφήμισης.	1	2	3	4	5	6	7
Αλλαγές στο μείγμα των προϊόντων/μάρκες των ανταγωνιστών.	1	2	3	4	5	6	7
Αλλαγές της στρατηγικής πωλήσεων των ανταγωνιστών. Αλλαγές στην προώθηση των πωλήσεων/στρατηγική διαφήμισης ανταγωνιστών .	1	2	3	4	5	6	7
Αλλαγές στις προτιμήσεις των καταναλωτών σχετικά με το χαρακτηριστικό γνώρισμα των προϊόντων.	1	2	3	4	5	6	7
Αλλαγές στις προτιμήσεις των καταναλωτών σχετικά με τις μάρκες των προϊόντων/υπηρεσιών.	1	2	3	4	5	6	7
Αλλαγές στις προτιμήσεις των καταναλωτών σχετικά με την ποιότητα/τιμή του προϊόντος.	1	2	3	4	5	6	7
Περιορισμένος φόβος για την επιβίωση και ευημερία της εταιρίας.	1	2	3	4	5	6	7
Πλούσιο σε επενδυτικές & διαφημιστικές ευκαιρίες.	1	2	3	4	5	6	7
Περιβάλλον το οποίο η εταιρία μπορεί να ελέγξει και να χειριστεί προς όφελός της όπως λ.χ μια κυρίαρχη εταιρία με περιορισμένο ανταγωνισμό & εμπόδια.	1	2	3	4	5	6	7

ΜΕΡΟΣ Ε: ΣΥΜΜΕΤΟΧΗ ΤΩΝ ΜΕΛΩΝ ΤΟΥ Δ.Σ ΣΤΗ ΛΗΨΗ ΣΤΡΑΤΗΓΙΚΩΝ ΑΠΟΦΑΣΕΩΝ

Σε αυτό το τμήμα παρακαλούμε να αποδώσετε πληροφορίες σχετικά με τη συμμετοχή των μελών του Δ.Σ στη διαδικασία λήψης στρατηγικών αποφάσεων.

Ε 22: Παρακαλώ να δηλώσετε το βαθμό που θεωρείται ότι τα μέλη του Δ.Σ συμμετέχουν στη διαμόρφωση και αξιολόγηση των στρατηγικών αποφάσεων της εταιρίας (1=Διαφωνώ απόλυτα, 7=Συμφωνώ απόλυτα)

	Διαφωνώ απόλυτα	Διαφωνώ	Διαφωνώ μερικώς	Ούτε συμφωνώ/διαφωνώ	Μερικώς συμφωνώ	Συμφωνώ	Συμφωνώ απόλυτα
<u>Διαμόρφωση καινούργιων στρατηγικών αποφάσεων</u>							
Τα μέλη του Δ.Σ συνήθως δεν συμμετέχουν στη διαμόρφωση στρατηγικών αποφάσεων.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως επικυρώνουν στρατηγικές προτάσεις που διαμορφώνονται κυρίως από ανώτατα Διοικητικά Στελέχη.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως διερευνούν και εν συνεχεία επικυρώνουν στρατηγικές προτάσεις που έχουν διαμορφωθεί κυρίως από ανώτατα Διοικητικά Στελέχη.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως διερευνούν προκειμένου να αναθεωρήσουν στρατηγικές προτάσεις που έχουν διαμορφωθεί από ανώτατα Διοικητικά Στελέχη.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως συμμετέχουν στη διαμόρφωση στρατηγικών αποφάσεων με τα ανώτατα διοικητικά στελέχη στα διοικητικά συμβούλια.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως συμμετέχουν στην διαμόρφωση στρατηγικών αποφάσεων κατά τη διάρκεια και τη διενέργεια των Δ.Σ.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως διαμορφώνουν στρατηγικές αποφάσεις συνήθως ανεξάρτητα από τα ανώτατα διοικητικά στελέχη.	1	2	3	4	5	6	7
<u>Αξιολόγηση προηγούμενων στρατηγικών αποφάσεων</u>							
Τα μέλη του Δ.Σ συνήθως δεν συμμετέχουν στην εξέλιξη των στρατηγικών αποφάσεων.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως δέχονται την αξιολόγηση των στρατηγικών αποφάσεων από τα ανώτατα διοικητικά στελέχη χωρίς διερευνητικές ερωτήσεις.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως αποδέχονται την αξιολόγηση των στρατηγικών αποφάσεων από τα ανώτατα διοικητικά στελέχη μετά από διερευνητικές ερωτήσεις.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως καθορίζουν το χρόνο και τα κριτήρια αξιολόγησης αλλά η πληροφόρηση παρέχεται από τα ανώτατα διοικητικά στελέχη & σπανίως αμφισβητείται από το Δ.Σ.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως καθορίζουν το χρόνο και τα κριτήρια αξιολόγησης στρατηγικών αποφάσεων ζητώντας επιπρόσθετη πληροφόρηση συχνά, για την εξέλιξη της έρευνας από τα ανώτατα διοικητικά στελέχη.	1	2	3	4	5	6	7
Τα μέλη του Δ.Σ συνήθως συγκεντρώνουν πληροφορίες σχετικά με την εξέλιξη των στρατηγικών αποφάσεων επιπρόσθετα με τις αναφορές των ανωτάτων διοικητικών στελεχών.	1	2	3	4	5	6	7

E23: Παρακαλώ να δηλώσετε τη συχνότητα των συναντήσεων του Δ.Σ.

Μια φορά το χρόνο Κάθε 4 μήνες Κάθε 15 μέρες
Κάθε έξι μήνες Κάθε μήνα Εβδομαδιαία

E24: Παρακαλώ να δηλώσετε τη διάρκεια των συναντήσεων του Δ.Σ.

Πάνω από 2 ώρες Μία και μισή ώρες 30 λεπτά
2 ώρες Μία ώρα Λιγότερο από 30 λεπτά

ΜΕΡΟΣ ΣΤ: ΔΙΑΔΙΚΑΣΙΑ ΛΗΨΗΣ ΣΤΡΑΤΗΓΙΚΩΝ ΑΠΟΦΑΣΕΩΝ (Ερωτήσεις 25-31)

Σε αυτό το τομέα αναζητούμε πληροφορίες σχετικά με τις ενέργειες των μελών του Δ. Σ προκειμένου να αναλάβουν στρατηγικές αποφάσεις .

E25: Στην εταιρία σας η ευθύνη καθορισμού των αιτιών ενός προβλήματος ανατίθεται:(αναφέρεται μόνο ένα):

- α. Οχι σε συγκεκριμένο άτομο ή ομάδα
- β. Ένα συγκεκριμένο άτομο
- γ. Δύο άτομα ταυτόχρονα
- δ. Μια υπάρχουσα επιτροπή τριών ή παραπάνω εργαζομένων
- ε. Μία ειδικά διαμορφωμένη ομάδα τριών ή παραπάνω εργαζομένων

E26: Στην προσπάθεια καθορισμού της αιτίας ενός προβλήματος η εταιρία (αναφέρεται μόνο ένα):

- α. Δεν επιθυμεί να βασιστεί σε τρίτους για οιαδήποτε βοήθεια
- β. Επιθυμεί να βασιστεί σε ένα ή δυο τρίτους που θα παρέχουν περιορισμένη βοήθεια
- γ. Επιθυμεί να βασιστεί σε ένα ή δυο τρίτους που θα παρέχουν μετρημένη βοήθεια
- δ. Επιθυμεί να βασιστεί σε τρίτους για σημαντική βοήθεια
- ε. Βασίζεται εξολοκλήρου σε τρίτους αν κριθεί αναγκαίο

E27: Στην εταιρία σας οι πιθανές αιτίες του προβλήματος εντοπίζονται κυρίως μέσα (αναφέρεται μόνο ένα) στις:

- α. Ιδέες ενός ατόμου
- β. Ανεπίσημες συζητήσεις μεταξύ διευθυντών
- γ. Καθορισμένες συζητήσεις μεταξύ διευθυντών
- δ. Καθορισμένες συναντήσεις και σε μερική ανάλυση
- ε. Καθορισμένες συναντήσεις και σε εκ βάθους ανάλυση

E28: Κατά προσέγγιση πόσοι υπάλληλοι συμμετέχουν άμεσα στον προσδιορισμό της αιτίας ενός προβλήματος (αναφέρεται μόνο ένα):

Δύο ή λιγότερα 5 με 6 9 με 10 Παραπάνω από 12
3 με 4 7 με 8 11 με 12

E29: Πόσα χρόνια κατά προσέγγιση με μέτρηση στοιχείων αρχείου χρειάζονται προκειμένου να εντοπιστεί η αιτία ενός προβλήματος στην εταιρία σας (π.χ παραγωγικότητα); (αναφέρεται μόνο ένα):

Λιγότερα από ένα Δύο Τέσσερα Πάνω από πέντε
Ένα Τρία Πέντε

E30: Παρακαλώ να δηλώσετε το βαθμό που πιστεύετε ότι η εταιρία σας ακολουθεί τις κάτωθι ενέργειες στη διαδικασία λήψης στρατηγικών αποφάσεων (1=Διαφωνώ απόλυτα, 7= Συμφωνώ απόλυτα).

	Διαφωνώ	Διαφωνώ	Διαφωνώ	Δεν	Συμφωνώ	Συμφωνώ	Συμφωνώ	Συμφωνώ
	1	2	3	4	5	6	7	7
<u>Χρηματοοικονομικές καταστάσεις</u>								
Χρήση δείκτη εσωτερικής απόδοσης ως μεθόδου κεφαλαιακού προϋπολογισμού	1	2	3	4	5	6	7	7
Χρήση καθαρής παρούσης αξίας ως μεθόδου κεφαλαιακού προϋπολογισμού	1	2	3	4	5	6	7	7
Συνυπολογισμός μη κατατιθεμένων χρηματοοικονομικών καταστάσεων.	1	2	3	4	5	6	7	7
Αναλυτικές κοστολογικές καταστάσεις	1	2	3	4	5	6	7	7
Συγχώνευση στρατηγικών αποφάσεων	1	2	3	4	5	6	7	7
<u>Επίσημοι Κανονισμοί</u>								
Γραπτές εντολές που καθορίζουν τη διαδικασία	1	2	3	4	5	6	7	7
Επίσημες διαδικασίες προσδιορισμού εναλλακτικού τρόπου δράσης	1	2	3	4	5	6	7	7
Επίσημες διαδικασίες προτεραιότητας	1	2	3	4	5	6	7	7
Επίσημα έγγραφα καθοδήγησης τελικών αποφάσεων	1	2	3	4	5	6	7	7
Προκαθορισμένα κριτήρια αξιολόγησης στρατηγικών αποφάσεων.	1	2	3	4	5	6	7	7

E31: Παρακαλώ να δηλώσετε σε τι βαθμό θεωρείτε ότι τα κάτωθι άτομα/ομάδες ή τμήματα συμμετέχουν στη διαδικασία λήψης στρατηγικών αποφάσεων (1=Καμία ανάμειξη, 7= Ενεργή συμμετοχή).

	Καμία	Πολύ μικρή	Χαμηλή	Μερική	Συμμετοχή	Υψηλή	Ενεργή
	1	2	3	4	5	6	7
<u>Ιεραρχική αποσυγκέντρωση</u>							
Ιδιοκτήτες/Μέτοχοι	1	2	3	4	5	6	7
Διευθύνων Σύμβουλος	1	2	3	4	5	6	7
Διευθυντές	1	2	3	4	5	6	7
Μεσαία Στελέχη	1	2	3	4	5	6	7
Χαμηλά Στελέχη	1	2	3	4	5	6	7
<u>Εμμεση επικοινωνία</u>							
Χρηματοοικονομικό και Λογιστικό Τμήμα	1	2	3	4	5	6	7
Τμήμα Παραγωγής	1	2	3	4	5	6	7
Τμήμα Προσωπικού	1	2	3	4	5	6	7
Τμήμα Πωλήσεων	1	2	3	4	5	6	7

ΜΕΡΟΣ Ζ: ΚΑΙΝΟΤΟΜΙΑ (Ερώτηση 32)

Σε αυτό το τμήμα αναζητούμε πληροφορίες στη νεωτεριστική διάθεση που δείχνουν τα μέλη του Δ.Σ .

E32: Παρακαλώ να δηλώσετε το βαθμό που θεωρείται ότι η εταιρία σας δίνει έμφαση στις κάτωθι νεωτεριστικές πρακτικές (1: Χωρίς έμφαση , 7: Υπερβάλλουσα έμφαση).

	Χωρίς έμφαση	Πολύ χαμηλή έμφαση	Χαμηλή έμφαση	Μερική έμφαση	Έμφαση	Πολύ έμφαση	Υπερβάλλουσα έμφαση
Καινοτομίες προϊόντων							
Πρώτη εταιρία του κλάδου που θα εισάγει καινούργια προϊόντα ή υπηρεσίες	1	2	3	4	5	6	7
Δημιουργία νέων προϊόντων για γρήγορη είσοδο στην αγορά	1	2	3	4	5	6	7
Δημιουργία νέων ποικιλιών σε υπάρχουσες σειρές προϊόντων ή υπηρεσιών	1	2	3	4	5	6	7
Αύξηση εσόδων λιγότερο από τρία χρόνια νέων προϊόντων	1	2	3	4	5	6	7
Διαδικασία Καινοτομίας							
Πρώτη εταιρία του κλάδου που εισάγει νέα τεχνολογία	1	2	3	4	5	6	7
Πρώτη εταιρία στον κλάδο που εισάγει βελτιωμένη τεχνολογία	1	2	3	4	5	6	7
Δημιουργία καινοτομικών τεχνολογιών	1	2	3	4	5	6	7
Αύξηση της επένδυσης σε ακραία τεχνολογία – προσανατολισμένη στην έρευνα και ανάπτυξη	1	2	3	4	5	6	7
Δημιουργία ριζικά νέων τεχνολογιών	1	2	3	4	5	6	7
Οργανωτική Καινοτομία							
Δημιουργία συστημάτων που ενθαρρύνουν την πρωτοβουλία και δημιουργικότητα μεταξύ των εργαζομένων	1	2	3	4	5	6	7
Ενθάρρυνση καινοτομιών μέσα στην εταιρία	1	2	3	4	5	6	7
Στήριξη οργανωτικής ομάδας που αποσκοπεί στην καινοτομία	1	2	3	4	5	6	7

ΜΕΡΟΣ Η: ΟΙΚΟΝΟΜΙΚΗ ΚΑΤΑΣΤΑΣΗ ΤΗΣ ΕΤΑΙΡΙΑΣ (Ερώτηση 33)

Σε αυτό το τμήμα αναζητούμε πληροφορίες σχετικά με την οικονομική κατάσταση της εταιρίας τα τελευταία πέντη έτη.

E33: Παρακαλώ κυκλώσετε τον αριθμό που κατά την εκτίμησή σας περιγράφει κατά προσέγγιση την οικονομική κατάσταση της εταιρίας σας σε σχέση με τους ανταγωνιστές σας στον ίδιο κλάδο.

	Χαμηλότερο 20%	Χαμηλότερο 20%	Μεσαίο 20%	Επόμενο 20%	Υψηλό 20%
Καθαρή απόδοση μετά τους φόρους στο σύνολο του Ενεργητικού	1	2	3	4	5
Καθαρή απόδοση μετά τους φόρους στις συνολικές πωλήσεις	1	2	3	4	5
Ρυθμός αύξησης συνολικών πωλήσεων της εταιρίας	1	2	3	4	5
Γενική επίδοση της εταιρείας και επιτυχία	1	2	3	4	5
Η ανταγωνιστική θέση της εταιρίας σας	1	2	3	4	5

Αν επιθυμείτε να κάνετε κάποιο σχόλιο για κάποια από τα στοιχεία που περιλαμβάνονται στο ανωτέρω ερωτηματολόγιο χρησιμοποιήστε το χώρο που βρίσκεται κατωτέρω:

Επιθυμείτε να λάβετε συμπληρωματικό αντίγραφο με τα πορίσματα της έρευνας; Ναι Όχι

Παρακαλώ να χρησιμοποιείται αυτός ο κώδικας για να αποφευχθούν οι αποστολές επιπρόσθετων υπενθυμιστικών σημειωμάτων

Παρακαλώ να επισυνάψετε την επαγγελματική σας κάρτα προκειμένου να λάβετε ένα συμπληρωματικό αντίγραφο με τα πορίσματα της έρευνας.

ΕΥΧΑΡΙΣΤΟΥΜΕ ΓΙΑ ΤΗ ΣΥΜΜΕΤΟΧΗ ΣΑΣ ΣΤΗΝ ΕΡΕΥΝΑ

Παρακαλώ να επιστρέψετε συμπληρωμένο το ανωτέρω ερωτηματολόγιο στον εσώκλειστο φάκελο που σας έχει αποσταλλεί .

Όλες οι πληροφορίες στο ερωτηματολόγιο θα παραμείνουν απόλυτα εμπιστευτικές και θα επεξεργαστούν από τους ακαδημαϊκούς ερευνητές που συμμετέχουν στην έρευνα.

Επαγγελματική Κάρτα

APPENDIX D: Correlation Matrix between Factor Items

D: 1 Correlation Matrix of External Corporate Environment																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1.	1																		
2.	.445	1																	
3.	.181	.101	1																
4.	.225	.095	.199	1															
5.	.142	-.007	.230	.556	1														
6.	.127	.182	.233	.463	.307	1													
7.	.084	.270	.256	.417	.190	.557	1												
8.	.247	.224	.340	.259	.297	.624	.677	1											
9.	.200	.285	.215	.267	.183	.691	.659	.818	1										
10.	.115	.113	.190	.527	.466	.573	.706	.610	.555	1									
11.	.111	.092	.105	.520	.464	.432	.600	.575	.507	.842	1								
12.	.282	.153	.158	.380	.246	.527	.537	.596	.638	.611	.736	1							
13.	.244	.270	.241	.325	-.010	.469	.578	.498	.526	.605	.511	.525	1						
14.	.123	.283	.231	.429	-.009	.545	.560	.451	.425	.555	.442	.452	.785	1					
15.	.049	.203	.128	.329	.147	.312	.312	.325	.255	.334	.320	.309	.498	.589	1				
16.	.155	.083	.005	-.069	.021	.139	.262	.343	.247	.209	.185	.246	.434	.322	.235	1			
17.	.202	.178	.351	.278	.085	.202	.113	.150	.084	.172	.031	.126	.291	.360	.260	.080	1		
18.	.286	.300	.197	-.032	-.045	.092	-.148	-.087	-.034	-.103	-.201	-.073	.073	.091	.272	.013	.388	1	11

1. Predictability in the market activities of your key competitors in your sector
2. Predictability in the tastes and preferences of your customers in your principal industry during the recent years
3. Increase in the innovation rate of new operating processes and new products or services in your principal industry
4. Hostility in the market activities of your key competitors
5. Influence of the market activities of your key competitors
6. Increase in the needed diversity in your production methods and marketing tactics to cater your different customers
7. Changes in the mix of products/brands carried
8. Changes in the sales strategies
9. Changes in the sales promotion/advertising strategies
10. Changes in the competitor's mix of products/brands
11. Changes in the competitor's sales strategies
12. Changes in the competitor's sales promotions/advertising strategies
13. Changes in the customer preferences of the product features
14. Changes in the customer preferences of the brands
15. Changes in the customer preferences of the product quality/price
16. Little threat to the survival and well-being of the company
17. Rich in investment and marketing opportunities
18. An environment that the company can control and manipulate to its own advantage such as a dominant firm has in industry with little competition and few hindrance

D:2 Correlation Matrix of Involvement in Strategic Decision-Making Process													
	1	2	3	4	5	6	7	8	9	10	11	12	13
1.	1												
2	.404	1											
3.	-.037	.466	1										
4.	-.037	.405	.702	1									
5.	-.214	.162	.410	.483	1								
6.	-.247	.033	.295	.380	.728	1							
7.	-.069	-.300	-.291	-.172	-.221	.065	1						
8.	.537	.294	-.033	-.107	-.232	-.265	-.098	1					
9.	.334	.028	-.170	-.162	-.282	-.223	.140	.450	1				
10.	.145	.463	.397	.275	.116	.094	-.152	.169	.121	1			
11.	.164	.318	.258	.267	.281	.155	-.121	.226	-.004	.457	1		
12.	-.094	.159	.246	.494	.530	.399	-.074	-.197	-.394	.199	.440	1	
13.	-.180	-.071	.090	.154	.155	.261	.270	-.377	-.096	-.036	-.038	.414	1

1. The board usually is not involved with the formation of the strategic decisions
2. The board usually ratifies strategic proposals which are formed solely by the top management
3. The board usually asks probing questions and then ratifies strategic proposals formed primarily by top management
4. The board usually asks probing questions which lead to revisions of strategic proposals formed by the top management
5. The board usually helps to form strategic decisions with the top management in board meetings
6. The board usually helps the top management to form to form strategic decisions within and between board meetings
7. The board usually forms the strategic decisions separately from the top management
8. The board is not usually involved with the monitoring of the progress of strategic decisions
9. The board usually accepts the evaluation of strategic decisions by the top management without asking probing questions
10. The board usually accepts the evaluation of strategic decisions by top management after asking probing questions
11. The board usually determines the timing and criteria of the evaluation, but that information is supplied by the top management and it is rarely challenged by the board
12. The board usually determines the timing and criteria of the evaluation and often requests additional information after receiving the progress report from the top management
13. The board usually collects its own information about the progress of the strategic decision, in addition to the top management reports.

D:3 Correlation Matrix of Financial Reporting in SD Making					
	1	2	3	4	5
1.	1				
2	.572	1			
3.	.399	.567	1		
4.	.294	.411	.355	1	
5.	.399	.549	.525	.633	1

Correlation Matrix of Financial Reporting in SD Making: Matrix Notation

1. Use of internal rate of return (IRR) as capital budgeting method
2. Use of net present value as capital budgeting method
3. Inclusion of pro-forma financial statements
4. Detailed cost studies
5. Incorporation of strategic decision

D:4 Correlation Matrix of Rule Formalisation in SD Making					
	1	2	3	4	5
1.	1				
2	.814	1			
3.	.628	.763	1		
4.	.685	.706	.719	1	
5.	.661	.712	.645	.658	1

Correlation Matrix of Rule Formalisation in SD Making: Matrix Notation

1. Written procedures guiding the process
2. Formal procedures to identify alternative ways of action
3. Formal screening procedures
4. Formal documents guiding the final decision
5. Predetermined criteria for strategic decision evaluation

D:5 Correlation Matrix of Hierarchical Decentralisation in SD Making					
	1	2	3	4	5
1.	1				
2	.338	1			
3.	.299	.592	1		
4.	.157	.288	.641	1	
5.	.102	.139	.370	.684	1

Correlation Matrix of Hierarchical Decentralisation in SD Making: Matrix Notation

1. Owner/Shareholders
2. Chief Executive Officer
3. First Level Directors
4. Middle Level Management
5. Lower level Management

D:6 Correlation Matrix of Lateral Communication in SD Making				
	1	2	3	4
1.	1			
2	.574	1		
3.	.380	.482	1	
4.	.428	.530	.574	1

Correlation Matrix of Lateral Communication in SD Making: Matrix Notation

1. Finance-accounting department
2. Production department
3. Personnel department
4. Purchasing department

D:7 Correlation Matrix of Innovation												
	1	2	3	4	5	6	7	8	9	10	11	12
1	1											
2	.799	1										
3	.692	.780	1									
4	.669	.757	.777	1								
5	.715	.747	.699	.616	1							
6	.738	.797	.736	.676	.922	1						
7	.578	.654	.650	.595	.832	.820	1					
8	.497	.601	.618	.490	.672	.675	.834	1				
9	.505	.604	.574	.512	.657	.642	.789	.915	1			
10	.510	.554	.528	.500	.568	.615	.536	.581	.557	1		
11	.502	.543	.485	.486	.550	.625	.513	.545	.563	.829	1	
12	.437	.485	.551	.511	.509	.583	.558	.603	.584	.799	.874	1

Correlation Matrix of Innovation: Matrix Notation

- 1Being the First Company in the Industry to introduce new Products/Services
- 2Creating New Products for Fast Market Introduction
- 3Creating New Variations to Existing Product Lines
- 4Increasing the Revenue from less than 3 Years Old New Products
- 5Being the First Company in the Industry to Introduce New Technology
- 6Being the First Company in the Industry to Introduce Technological Improvements
- 7Creating Innovative Technologies
- 8Investing Heavily in Cutting Edge Process Technology-Oriented R&D
- 9Developing Radical New Technology
- 10Developing Systems that Encourage Initiatives and Creativity among Employees
- 11Encouraging Innovation in the Organisation
- 12Supporting an Organisational Unit that Drive Innovation

D:8 Correlation Matrix of Organisational Performance					
	1	2	3	4	5
1. After-Tax Return on Total Assets	1				
2. After-Tax Return on Total Sales	.913	1			
3. Firm's Total Sales Growth	.463	.538	1		
4. Overall Firm Performance and Success	.750	.753	.691	1	
5. Our Competitive Position	.705	.710	.654	.851	1

**APPENDIX E: PEARSON PRODUCT-MOMENT CORRELATION
ANALYSIS**

Table 6:1a Hypothesis Testing: Product-moment Correlations Between Board Size, Interlocking Directors, Leadership Structure and Environmental Dimensions(factors were extracted with eigenvalue greater than one)				
Environmental Dimensions, Board Size, Interlocking Directors Measurements	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
ENV1: Dynamism in Marketing Practices	H1b+	.074	.517	Not significant
ENV2: Customer Dynamism	H1b-	-.019	.882	Not significant
ENV3: Environmental Competitor's Dynamism	H1b+	.056	.625	Not significant
ENV4: Environmental Complexity-Munificence	H1a+	.058	.609	Not significant
BODSIZ: Board Size	H1c-	-.124	.275	Not significant
INTERDIR: Interlocking Directors	H1a- and H1d-	-.058	.649	Not Significant
Leadership Structure: CEO Duality	H1e+	.250	.026	Supported

**Correlation is significant at the 0.01 level (2-tailed).

Table 6:1b Hypothesis Testing: Product-moment Correlations Between Board Size, Interlocking Directors , Leadership Structure and Environmental Dimensions(three forced factors were extracted)				
Environmental Dimensions Measurements, Board Size, Interlocking Directors	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
ENV1: Environmental Dynamism	H1b-	-.053	.640	Not significant
ENV2: Environmental Munificence/Hostility	H1c-	-.150	.188	Not significant
ENV3: Environmental Complexity	H1a+	.100	.380	Not significant
BODSIZ: Board Size	H1d-	-.150	.188	Not significant
INTERDIR: Interlocking directors	H1a-	-.091	.476	Not significant
Leadership Structure: CEO Duality	H1e+	.249	.027	Supported

**Correlation is significant at the 0.01 level (2-tailed).

Table 6:2 Hypothesis Testing: Product-moment Correlations Between Organisational Size, Executive Directors, Non-Executive Directors and Board Size				
Board Size, Organisational Size, Executive Directors, Non-Executive Directors, Organisational Performance	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
ORGSIZ: Organisational Size	H2a+	.334	.001	Supported
ORGPFORMANCE: Organisational Performance	H2b+	.205	.072	Not significant
EXECDIR: Executive directors	H2c+	.428	.000	Supported
NONEXECDIR: Non-executive directors	H2d+	.679	.000	Supported

**Correlation is significant at the 0.01 level (2-tailed).

Table 6:3a Hypothesis Testing: Product-moment Correlations Between Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty and Involvement in Strategic Decision-Making Process(three factors were extracted with eigenvalue greater than one)

Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty And INVSDM1:Formation and Process in Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
BODSIZ: Board Size	H3a+	.037	.725	Not Significant
INTERDIR: Inside directors	H3b+	.195	.070	Not Significant
FREQBODMEET: Frequency of Board Meetings	H3c+	.355	.000	Supported
DURBODMEET: Duration of Board Meetings	H3d-	-.125	.231	Not Significant
ENV4: Environmental Complexity-Munificence	H3e+	.183	.114	Not Significant
Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty And INVSDM2:Formation and Evaluation of Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
BODSIZ: Board Size	H3a+	.215	.037	Supported
INTERDIR: Inside directors	H3b+	.124	.251	Not Significant
FREQBODMEET: Frequency of Board Meetings	H3c+	.253	.014	Supported
DURBODMEET: Duration of Board Meetings	H3d-	-.125	.231	Not Significant
ENV4: Environmental Complexity-Munificence	H3e+	.031	.787	Not Significant
Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty And INVSDM3: Evaluation of Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
BODSIZ: Board Size	H3a+	.076	.465	Not Significant
INTERDIR: Inside directors	H3b-	-.208	.054	Not Significant
FREQBODMEET: Frequency of Board Meetings	H3c+	.192	.065	Not Significant
DURBODMEET: Duration of Board Meetings	H3d-	-.005	.960	Not Significant
ENV4: Environmental Complexity-Munificence	H3e+	.065	.577	Not Significant

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:3b Hypothesis Testing: Product-moment Correlations Between Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty and Involvement in Strategic Decision-Making Process(two forced factors were extracted)				
Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty And INVSDM1:Formation of Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
BODSIZ: Board Size	H3a+	.103	.328	Not Significant
INTERDIR: Inside directors	H3b+	.217	.046	Supported
FREQBODMEET: Frequency of Board Meetings	H3c+	.442	.000	Supported
DURBODMEET: duration of board meetings	H3d-	-.050	.640	Not Significant
ENV3: Environmental Complexity	H3e+	.132	.261	Not Significant
Board Size, Inside Directors, Frequency of Board Meetings, Duration of Board Meetings, Environmental Uncertainty And INVSDM2: Evaluation of Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
BODSIZ: Board Size	H3a+	.210	.045	Supported
INTERDIR: Inside directors	H3b-	-.098	.374	Not Significant
FREQBODMEET: Frequency of Board Meetings	H3c+	.233	.026	Supported
DURBODMEET: Duration of Board Meetings	H3d-	-.045	.669	Not Significant
ENV3: Environmental Complexity	H3e+	.045	.704	Not Significant

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4a1 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Financial Reporting in Strategic Decision-Making				
Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Financial Reporting	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H6a-	-.271	.016	Supported
EDUCSPEC: Educational Specialty	H6b+	.038	.742	Not Significant
FUNCBAC: Functional Background	H6c-	-.282	.012	Supported
INDTEN: Industry Tenure	H6d+	.096	.410	Not Significant
COMPTEN: Company Tenure	H6d+	.157	.174	Not Significant
POSTEN: Position tenure	H6d+	.118	.312	Not Significant
ENV1: Dynamism in Marketing Practices	H6e+	.424	.000	Supported
ENV2: Customer Dynamism	H6e+	.042	.734	Not Significant
ENV3: Environmental Competitor's Dynamism	H6e+	.108	.376	Not Significant
ENV4: Environmental Complexity-Munificence	H6e+	.325	.006	Supported

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4a2 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Rule Formalisation in Strategic Decision-Making

Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Financial Reporting	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.306	.003	Supported
EDUCSPEC: Educational Specialty	H4b+	.070	.512	Not Significant
FUNCBAC: Functional Background	H4c-	-.183	.084	Not Significant
INDTEN: Industry Tenure	H4d+	.062	.567	Not Significant
COMPTE: Company Tenure	H4d+	.036	.739	Not Significant
POSTEN: Position tenure	H4d+	.092	.396	Not Significant
ENV1: Dynamism in Marketing Practices	H4e+	.294	.010	Supported
ENV2: Customer Dynamism	H4e-	-.101	.386	Not Significant
ENV3: Environmental Competitor's Dynamism	H4e+	.215	.062	Not Significant
ENV4: Environmental Complexity-Munificence	H4e+	.205	.075	Not Significant

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4a3 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Hierarchical Decentralisation in Strategic Decision-Making

Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Hierarchical Decentralisation (Lower level Management) in Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.061	.561	Not Significant
EDUCSPEC: Educational Specialty	H4b+	.046	.658	Not Significant
FUNCBAC: Functional Background	H4c-	-.062	.560	Not Significant
INDTEN: Industry Tenure	H4d+	.095	.374	Not Significant
COMPTE: Company Tenure	H4d-	-.015	.887	Not Significant
POSTEN: Position tenure	H4d-	-.007	.950	Not Significant
ENV1: Dynamism in Marketing Practices	H4e+	.177	.120	Not Significant
ENV2: Customer Dynamism	H4e+	.044	.700	Not Significant
ENV3: Environmental Competitor's Dynamism	H4e+	.007	.953	Not Significant
ENV4: Environmental Complexity-Munificence	H4e-	-.095	.404	Not Significant
Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Hierarchical Decentralisation (Upper Level Management)	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.401	.000	Supported
EDUCSPEC: Educational Specialty	H4b+	.034	.741	Not Significant
FUNCBAC: Functional Background	H4c-	-.105	.318	Not Significant
INDTEN: Industry Tenure	H4d-	-.030	.774	Not Significant
COMPTE: Company Tenure	H4d-	-.077	.474	Not Significant
POSTEN: Position tenure	H4d+	.076	.474	Not Significant
ENV1: Dynamism in Marketing Practices	H4e+	.009	.936	Not Significant
ENV2: Customer Dynamism	H4e+	.241	.034	Supported
ENV3: Environmental Competitor's Dynamism	H4e+	.044	.700	Not Significant
ENV4: Environmental Complexity-Munificence	H4e+	.007	.953	Not Significant

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4a4 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Lateral Communication

Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Lateral Communication	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.244	.030	Supported
EDUCSPEC: Educational Specialty	H4b-	-.018	.872	Not Significant
FUNCBAC: Functional Background	H4c-	-.151	.186	Not Significant
INDTEN: Industry Tenure	H4d+	.211	.069	Not Significant
COMPTEN: Company Tenure	H4d+	.060	.606	Not Significant
POSTEN: Position tenure	H4d+	.157	.176	Not Significant
ENV1: Dynamism in Marketing Practices	H4e+	.406	.000	Supported
ENV2: Customer Dynamism	H4e-	-.103	.395	Not Significant
ENV3: Environmental Competitor's Dynamism	H4e+	.213	.075	Not Significant
ENV4: Environmental Complexity-Munificence	H4e+	.332	.006	Supported

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:5a Hypothesis Testing: Product-moment Correlations Between Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Product & Process Innovation Practices

Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors and Product and Process Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.003	.982	Not Significant
AGED: Age of Directors	H5b-	-.074	.529	Not Significant
FEMREPRES: Female representation	H5c+	.095	.414	Not Significant
INDTEN: Industry tenure	H5d-	-.098	.413	Not Significant
COMPTEN: Company tenure	H5d-	-.116	.326	Not Significant
POSTEN: Position tenure	H5d-	-.006	.957	Not Significant
EDUCLEVEL: Educational level	H5e-	-.074	.526	Not Significant
EDUCSPEC: Educational specialty	H5f+	.027	.203	Not Significant
ENV1: Dynamism in Marketing Practices	H5g+	.261	.030	Supported
ENV2: Customer Dynamism	H5g-	-.082	.502	Not Significant
ENV3: Environmental Competitor's Dynamism	H5g+	.320	.007	Supported
ENV4: Environmental Complexity-Munificence	H5g+	.441	.000	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Organisational Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.040	.732	Not Significant
AGED: Age of Directors	H5b+	.192	.099	Not Significant
FEMREPRES: Female representation	H5c-	-.159	.169	Supported
INDTEN: Industry tenure	H5d+	.177	.137	Not Significant
COMPTEN: Company tenure	H5d+	.068	.568	Not Significant
POSTEN: Position tenure	H5d-	-.035	.770	Not Significant
EDUCLEVEL: Educational level	H5e-	-.314	.006	Supported
EDUCSPEC: Educational specialty	H5f+	.148	.203	Not Significant
ENV1: Dynamism in Marketing Practices	H5g+	.283	.018	Supported
ENV2: Customer Dynamism	H5g+	.121	.322	Not Significant
ENV3: Environmental Competitor's Dynamism	H5g+	.074	.546	Not Significant
ENV4: Environmental Complexity-Munificence	H5g+	.031	.802	Not Significant

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4b1 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Financial Reporting in Strategic Decision-Making				
Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Financial Reporting	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.271	.016	Supported
EDUCSPEC: Educational Specialty	H4b+	.038	.742	Not Significant
FUNCBAC: Functional Background	H4c-	-.282	.012	Supported
INDTEN: Industry Tenure	H4d+	.096	.410	Not Significant
COMPTEN: Company Tenure	H4d+	.157	.174	Not Significant
POSTEN: Position Tenure	H4d+	.118	.312	Not Significant
ENV1: Environmental Dynamism	H4e+	.356	.003	Supported
ENV2: Environmental Munificence/Hostility	H4e+	.074	.547	Not Significant
ENV3: Environmental Complexity	H4e+	.387	.001	Supported

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4b2 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Rule Formalisation in Strategic Decision-Making				
Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Financial Reporting	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.306	.003	Supported
EDUCSPEC: Educational Specialty	H4b+	.070	.512	Not Significant
FUNCBAC: Functional Background	H4c-	-.183	.084	Not Significant
INDTEN: Industry Tenure	H4d+	.062	.567	Not Significant
COMPTEN: Company Tenure	H4d+	.036	.739	Not Significant
POSTEN: Position tenure	H4d+	.092	.396	Not Significant
ENV1: Environmental Dynamism	H4e+	.264	.021	Supported
ENV2: Environmental Munificence/Hostility	H4e-	-.075	.520	Not Significant
ENV3: Environmental Complexity	H4e+	.289	.011	Supported

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4b3 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Hierarchical Decentralisation in Strategic Decision-Making				
Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Hierarchical Decentralisation in Strategic Decision-Making	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.294	.004	Supported
EDUCSPEC: Educational Specialty	H4b+	.046	.664	Not Significant
FUNCBAC: Functional Background	H4c-	-.113	.285	Not Significant
INDTEN: Industry Tenure	H4d+	.033	.758	Not Significant
COMPTEN: Company Tenure	H4d+	.034	.753	Not Significant
POSTEN: Position tenure	H4d+	.000	.996	Not Significant
ENV1: Environmental Dynamism	H4e+	.225	.048	Supported
ENV2: Environmental Munificence/Hostility	H4e+	.230	.043	Not Significant
ENV3: Environmental Complexity	H4e+	.285	.011	Supported

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 6:4b4 Hypothesis Testing: Product-moment Correlations Between Educational Level, Educational Specialty, Functional Background, Industry, Company, Environmental Dimensions and Lateral Communication

Educational Level, Educational Specialty, Functional Background, Industry, Company, Position Tenure, Environmental Dimensions and Lateral Communication	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
EDUCLEVEL: Educational Level	H4a-	-.244	.030	Supported
EDUCSPEC: Educational Specialty	H4b-	-.018	.872	Not Significant
FUNCBAC: Functional Background	H4c-	-.151	.186	Not Significant
INDTEN: Industry Tenure	H4d+	.211	.069	Not Significant
COMP TEN: Company Tenure	H4d+	.060	.606	Not Significant
POSTEN: Position tenure	H4d+	.157	.176	Not Significant
ENV1: Environmental Dynamism	H4e+	.336	.004	Supported
ENV2: Environmental Munificence/Hostility	H4e-	-.084	.487	Not Significant
ENV3: Environmental Complexity	H4e+	.464	.000	Supported

**Correlation is significant at the 0.01 level (2-tailed)., *Correlation is significant at the 0.05 level (2-tailed)

Table 6:5b Hypothesis Testing: Product-moment Correlations Between Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Product Innovation Practices

Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors and Product Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.024	.835	Not Significant
AGED: Age of Directors	H5b+	.082	.487	Not Significant
FEMREPRES: Female representation	H5c+	.123	.292	Supported
INDTEN: Industry tenure	H5d+	.004	.976	Not Significant
COMP TEN: Company tenure	H5d-	-.045	.708	Not Significant
POSTEN: Position tenure	H5d+	.082	.490	Not Significant
EDUCLEVEL: Educational level	H5e-	-.157	.176	Not Significant
EDUCSPEC: Educational specialty	H5f-	-.033	.777	Not Significant
ENV1: Environmental Dynamism	H5g+	.166	.173	Not Significant
ENV2: Environmental Munificence/Hostility	H5g+	.173	.154	Not Significant
ENV3: Environmental Complexity	H5g+	.432	.000	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Process Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a-	-.024	.841	Not Significant
AGED: Age of Directors	H5b-	-.213	.067	Not Significant
FEMREPRES: Female representation	H5c-	-.024	.834	Supported
INDTEN: Industry tenure	H5d-	-.132	.269	Not Significant
COMP TEN: Company tenure	H5d-	-.115	.331	Not Significant
POSTEN: Position tenure	H5d-	-.108	.364	Not Significant
EDUCLEVEL: Educational level	H5e+	.052	.655	Not Significant
EDUCSPEC: Educational specialty	H5f+	.107	.360	Not Significant
ENV1: Environmental Dynamism	H5g+	.195	.108	Not Significant
ENV2: Environmental Munificence/Hostility	H5g+	.180	.140	Not Significant
ENV3: Environmental Complexity	H5g+	.261	.030	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Organisational Innovation Practices Measures				
OUTDIR: Outside directors	H5a+	.048	.683	Not Significant
AGED: Age of Directors	H5b+	.246	.099	Supported
FEMREPRES: Female representation	H5c-	-.149	.198	Supported
INDTEN: Industry tenure	H5d+	.212	.074	Supported
COMP TEN: Company tenure	H5d+	.093	.435	Not Significant
POSTEN: Position tenure	H5d-	-.007	.952	Not Significant
EDUCLEVEL: Educational level	H5e-	-.343	.002	Supported
EDUCSPEC: Educational specialty	H5f+	.127	.276	Not Significant
ENV1: Environmental Dynamism	H5g+	.269	.026	Supported
ENV2: Environmental Munificence/Hostility	H5g+	.088	.471	Not Significant
ENV3: Environmental Complexity	H5g+	.078	.526	Not Significant

**Correlation is significant at the 0.01 level (2-tailed)., *Correlation is significant at the 0.05 level (2-tailed)..

Table 6:5a Hypothesis Testing: Product-moment Correlations Between Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Product & Process Innovation Practices

Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors and Product and Process Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.003	.982	Not Significant
AGED: Age of Directors	H5b-	-.074	.529	Not Significant
FEMREPRES: Female representation	H5c+	.095	.414	Not Significant
INDTEN: Industry tenure	H5d-	-.098	.413	Not Significant
COMP TEN: Company tenure	H5d-	-.116	.326	Not Significant
POSTEN: Position tenure	H5d-	-.006	.957	Not Significant
EDUCLEVEL: Educational level	H5e-	-.074	.526	Not Significant
EDUCSPEC: Educational specialty	H5f+	.027	.203	Not Significant
ENV1: Dynamism in Marketing Practices	H5g+	.261	.030	Supported
ENV2: Customer Dynamism	H5g-	-.082	.502	Not Significant
ENV3: Environmental Competitor's Dynamism	H5g+	.320	.007	Supported
ENV4: Environmental Complexity-Munificence	H5g+	.441	.000	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Organisational Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.040	.732	Not Significant
AGED: Age of Directors	H5b+	.192	.099	Not Significant
FEMREPRES: Female representation	H5c-	-.159	.169	Supported
INDTEN: Industry tenure	H5d+	.177	.137	Not Significant
COMP TEN: Company tenure	H5d+	.068	.568	Not Significant
POSTEN: Position tenure	H5d-	-.035	.770	Not Significant
EDUCLEVEL: Educational level	H5e-	-.314	.006	Supported
EDUCSPEC: Educational specialty	H5f+	.148	.203	Not Significant
ENV1: Dynamism in Marketing Practices	H5g+	.283	.018	Supported
ENV2: Customer Dynamism	H5g+	.121	.322	Not Significant
ENV3: Environmental Competitor's Dynamism	H5g+	.074	.546	Not Significant
ENV4: Environmental Complexity-Munificence	H5g+	.031	.802	Not Significant

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed).

Table 6:5b Hypothesis Testing: Product-moment Correlations Between Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Product Innovation Practices

Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors and Product Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a+	.024	.835	Not Significant
AGED: Age of Directors	H5b+	.082	.487	Not Significant
FEMREPRES: Female representation	H5c+	.123	.292	Supported
INDTEN: Industry tenure	H5d+	.004	.976	Not Significant
COMP TEN: Company tenure	H5d-	-.045	.708	Not Significant
POSTEN: Position tenure	H5d+	.082	.490	Not Significant
EDUCLEVEL: Educational level	H5e-	-.157	.176	Not Significant
EDUCSPEC: Educational specialty	H5f-	-.033	.777	Not Significant
ENV1: Environmental Dynamism	H5g+	.166	.173	Not Significant
ENV2: Environmental Munificence/Hostility	H5g+	.173	.154	Not Significant
ENV3: Environmental Complexity	H5g+	.432	.000	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Process Innovation Practices Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
OUTDIR: Outside directors	H5a-	-.024	.841	Not Significant
AGED: Age of Directors	H5b-	-.213	.067	Not Significant

FEMREPRES: Female representation	H5c-	-.024	.834	Supported
INDTEN: Industry tenure	H5d-	-.132	.269	Not Significant
COMPEN: Company tenure	H5d-	-.115	.331	Not Significant
POSTEN: Position tenure	H5d-	-.108	.364	Not Significant
EDUCLEVEL: Educational level	H5e+	.052	.655	Not Significant
EDUCSPEC: Educational specialty	H5f+	.107	.360	Not Significant
ENV1: Environmental Dynamism	H5g+	.195	.108	Not Significant
ENV2: Environmental Munificence/Hostility	H5g+	.180	.140	Not Significant
ENV3: Environmental Complexity	H5g+	.261	.030	Supported
Outside Directors, Age of Board Members, Industry, Company, Position Tenure, Educational Level, Educational Specialty, Number of Female Directors, Environmental Dimensions and Organisational Innovation Practices Measures				
OUTDIR: Outside directors	H5a+	.048	.683	Not Significant
AGED: Age of Directors	H5b+	.246	.099	Supported
FEMREPRES: Female representation	H5c-	-.149	.198	Supported
INDTEN: Industry tenure	H5d+	.212	.074	Supported
COMPEN: Company tenure	H5d+	.093	.435	Not Significant
POSTEN: Position tenure	H5d-	-.007	.952	Not Significant
EDUCLEVEL: Educational level	H5e-	-.343	.002	Supported
EDUCSPEC: Educational specialty	H5f+	.127	.276	Not Significant
ENV1: Environmental Dynamism	H5g+	.269	.026	Supported
ENV2: Environmental Munificence/Hostility	H5g+	.088	.471	Not Significant
ENV3: Environmental Complexity	H5g+	.078	.526	Not Significant

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed).

Table 6:6a Hypothesis Testing: Product-moment Correlations Between Strategic Decision-Making Processes , Innovation Practices and Organisational Performance

Strategic Decision-Making Processes , Innovation Practices and Organisational Performance Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
INVSDM1:Formation &Process of SDM	H6a+	-.020	.863	Not Significant
INVSDM2:Formation &Evaluation of SDM	H6a+	.114	.326	Not Significant
INVSDM3: Evaluation of SDM	H6a+	-.142	.222	Not Significant
FINREP: Financial Reporting	H6a+	.311	.010	Supported
RULEFORM: Rule Formalisation	H6a+	.232	.045	Supported
HIERDECENT1:Lower Level Management	H6a+	.149	.196	Not Significant
HIERDECENT2:Upper Level Management	H6a+	.196	.087	Not Significant
LATCOM: Lateral Communication	H6a+	.030	.815	Not Significant
INN1:Product &Process Innovation	H6a+	.240	.056	Not Significant
INN2:Organisational Innovation	H6a+	.330	.008	Supported

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed).

Table 6:6b Hypothesis Testing: Product-moment Correlations Between Strategic Decision-Making Processes , Innovation Practices and Organisational Performance

Strategic Decision-Making Processes , Innovation Practices and Organisational Performance Measures	Hypothesised Relationship	Correlation Coefficient (r)	Significant Level	Conclusion of Hypothesis Test
SD1:Formation of SDM	H6a+	.009	.938	Not Significant
SD1:Evaluation of SDM	H6a+	.032	.784	Not Significant
FINREP: Financial Reporting	H6a+	.311	.010	Supported
RULEFORM: Rule Formalisation	H6a+	.232	.045	Supported
HIERDECENT: Hierarchical Decentralisation	H6a+	.245	.032	Supported
LATCOM: Lateral Communication	H6a+	.130	.815	Not Significant
INNP: Product Innovation	H6a+	.131	.301	Not Significant
INNPC: Process Innovation	H6a+	.226	.073	Not Significant
INNORG: Organisational Innovation	H6a+	.304	.014	Supported

**Correlation is significant at the 0.01 level (2-tailed), *Correlation is significant at the 0.05 level (2-tailed).

APPENDIX F: Regression Analysis Results

Table 6:7 Regression Estimates of the Board Size

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	7.999	.323		24.765	.000		
ENV1	0.212	.321	.074	.660	.511	1.000	1.000
ENV2	-0.575	.326	-.198	-1.762	.082	1.000	1.000
ENV3	-0.355	.325	-.123	-1.094	.278	1.000	1.000
ENV4	0.166	.323	.058	.514	.609	1.000	1.000

See Table 6:8 for full parameter notation

F-statistics = 1.259

Significance of F=.294

R² = .064

Adjusted R² = .013

Table 6:8 Regression Estimates (Unstandardised) of the Board Size Relationship

$$BODSIZ=f [7.999(\text{Intercept})+0.212(\text{ENV1}) -0.575(\text{ENV2}) 0.355(\text{ENV3})+0.166(\text{ENV4})]$$

Where:

ENV1: Environmental Dynamism in Marketing Practices

ENV2:Environmental Customer Dynamism

ENV3: Environmental Competitor's Dynamism

ENV4: Environmental Complexity-Munificence

Table 6:9 Regression Estimates of the Interlocking Board Members

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	3.570	.398		8.975	.000		
ENV1	-0.060	.378	-.021	-.160	.873	.996	1.004
ENV2	0.136	.459	.039	.297	.768	.980	1.021
ENV3	-0.409	.399	-.133	-1.024	.310	.984	1.016
ENV4	-0.192	.399	-.062	-.481	.632	.998	1.002

See Table 6:10 for full parameter notation

F-statistics = .364

Significance of F= .833

R² = .024

Adjusted R² = -.042

Table 6:10 Regression Estimates(Unstandardised) of the Interlocking Board Members Relationship

$$\text{INTERDIR} = f [3.570 (\text{Intercept}) -0.060 (\text{ENV1}) + 0.136 (\text{ENV2}) -0.409 (\text{ENV3}) -0.192 (\text{ENV4})]$$

Where:

ENV1: Environmental Dynamism in Marketing Practices

ENV2:Environmental Customer Dynamism

ENV3: Environmental Competitor’s Dynamism

ENV4: Environmental Complexity-Munificence

Table 6:11 Regression Estimates of the Board Size

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	8.005	.326		24.582	.000		
ENV1	-0.152	.325	-.053	-.467	.642	1.000	1.000
ENV2	-0.435	.331	-.149	-1.315	.192	1.000	1.000
ENV3	0.286	.324	.100	.884	.379	1.000	1.000

See Table 6:12 for full parameter notation

F-statistics = .912

Significance of F= .440

R² = .035

Adjusted R² = -.003

Table 6:12 Regression Estimates (Unstandardised) of the Board Size Relationship

$$\text{BODSIZ} = f [8.005(\text{Intercept}) -0.152 (\text{ENV1}) -0.435 (\text{ENV2}) + 0.286 (\text{ENV3})]$$

Where:

ENV1: Environmental Dynamism

ENV2:Environmental Hostility/Munificence

ENV3:Environmental Complexity/Homogeneity-Heterogeneity

Table 6:13 Regression Estimates of the Interlocking Board Members

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	3.556	.396		8.974	.000		
ENV1	-0.088	.387	-.029	-.228	.821	.985	1.016
ENV2	0.181	.434	.054	.417	.678	.984	1.016
ENV3	-0.287	.400	-.092	-.716	.477	.992	1.008

See Table 6:14 for full parameter notation

F-statistics = .250

Significance of F= .861

R² = 0.012

Adjusted R² = -.037

Table 6:14 Regression Estimates (Unstandardised) of the Interlocking Board Members Relationship
 $INTERDIR = f [3.556 \text{ (Intercept)} -0.088 \text{ (ENV1)} + 0.181 \text{ (ENV2)} -0.287 \text{ (ENV3)}]$

Where:
 ENV1: Environmental Dynamism
 ENV2: Environmental Hostility/Munificence
 ENV3: Environmental Complexity/Homogeneity-Heterogeneity

Table 6:15 Regression Estimates of the Leadership Structure

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	1.540	.055		27.842	.000		
ENV1	0.130	.057	.252	2.271	.026	.998	1.002
ENV2	-0.054	.055	-.109	-.983	.329	.999	1.001
ENV3	0.024	.055	.048	.430	.669	.999	1.001
ENV4	-0.053	.055	-.108	-.971	.334	1.000	1.000

See Table 6:16 for full parameter notation

F-statistics = 1.795
 Significance of F= .139
 $R^2 = .088$
 Adjusted $R^2 = 0.039$

Table 6:16 Regression Estimates(Unstandardised) of the Leadership Structure Relationship
 $CEODUALITY = f [1.540 \text{ (Intercept)} +0.130 \text{ (ENV1)} -0.054 \text{ (ENV2)} +0.024 \text{ (ENV3)} -0.053 \text{ (ENV4)}]$

Where:
 ENV1: Environmental Dynamism in Marketing Practices
 ENV2: Environmental Customer Dynamism
 ENV3: Environmental Competitor's Dynamism
 ENV4: Environmental Complexity-Munificence

Table 6:17 Regression Estimates of the Leadership Structure

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	1.540	.054		28.269	.000		
ENV1	0.130	.055	.256	2.343	.022	.998	1.002
ENV2	-0.101	.055	-.202	-1.850	.068	.999	1.001
ENV3	0.014	.055	.028	.260	.795	.999	1.001

See Table 6:18 for full parameter notation

F-statistics = 2.887

Significance of F=.041

R² = .104

Adjusted R² = .068

Table 6:18 Regression Estimates (Unstandardised) of the Leadership Structure Relationship

CEODUALITY =f [1.540 (Intercept) +0.130 (ENV1)-0.130 (ENV2) +0.014 (ENV3)]

Where:

ENV1: Environmental Dynamism

ENV2:Environmental Hostility/Munificence

ENV3:Environmental Complexity/Homogeneity-Heterogeneity

Table 6:19 Regression Estimates of the Board Size

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	7.651	.296		25.821	.000		
Organisational Size	0.000	.000	.334	3.524	.001	1.000	1.000

See Table 6:20 for full parameter notation

F-statistics = 12.419

Significance of F= .001

R² = .111

Adjusted R² = .102

Table 6:20 Regression Estimates (Unstandardised) of the Board Size Relationship
 $BODSIZ = f [7.651 (\text{Intercept}) + 0.000 (\text{ORGSIZ})]$

Where:
 ORGSIZ: Organisational Size

Table 6:21 Regression Estimates of the Organisational Performance

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-.520	.318		-1.636	.106		
Board Size	0.066	0.036	0.205	1.825	.072	1.000	1.000

See Table 6:22 for full parameter notation

F-statistics = 3.332
 Significance of F= .072
 $R^2 = .042$
 Adjusted $R^2 = .029$

Table 6:22 Regression Estimates(Unstandardised) of the Board Size-Organisational Performance Relationship
 $ORGP\text{ERF} = f [-.520 (\text{Intercept}) + 0.066 (\text{BODSIZ})]$

Where:
 BODSIZ: Board Size

Table 6:23 Regression Estimates of the Executive Directors

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	1.264	.464		2.724	.008		
Board Size	0.241	.054	.428	4.494	.000	1.000	1.000

See Table 6:24 for full parameter notation

F-statistics = 20.198
 Significance of F= .000
 $R^2 = .183$
 Adjusted $R^2 = .174$

Table 6:24 Regression Estimates(Unstandardised) of the Board Size-Executive Directors Relationship

$EX\text{ECDIR} = f [1.264 (\text{Intercept}) + 0.241 (\text{BODSIZ})]$

Where:
 BODSIZ: Board Size

Table 6:25 Regression Estimates of the Non-Executive Directors

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-1.574	.710		-2.216	.030		
Board Size	0.604	.077	.679	7.853	.000	1.000	1.000

See Table 6:26 for full parameter notation

F-statistics = 61.674
 Significance of F= .000
 R² = .461
 Adjusted R² = .454

Table 6:26 Regression Estimates (Unstandardised) of the Board Size-Non Executive Directors Relationship

$$\text{NONEXECDIR} = f[-1.574 (\text{Intercept}) + 0.604 (\text{BODSIZ})]$$

Where:
 BODSIZ: Board Size

Table 6:27 Regression Estimates of the INVSDM1 Formation and Process of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.071	.667		-.106	.916		
Board Size	-0.065	.053	-.178	-1.218	.228	.537	1.861
Inside/Internal Board Members	0.098	.077	.178	1.280	.206	.596	1.678
Once a year (1:yes, no:0)	-2.385	.885	-.595	-2.031	.009	.236	4.239
Quarterly (1:yes, no:0)	-1.674	.824	-.589	-2.031	.047	.136	7.335
Every Month (1:yes, no:0)	-0.694	.772	-.334	-.899	.373	.083	11.999
Every 15 days (1:yes, no:0)	0.488	.817	-.165	-.597	.553	.150	6.668
Weekly (1:yes, no:0)	-0.916	.780	-.248	-1.175	.245	.257	3.885
More than Two Hours(1:yes, no:0)	1.288	.764	.605	1.685	.098	.089	11.207
Two Hours (1:yes, no:0)	1.351	.793	.589	1.703	.094	.096	10.423
One and a half hour (1:yes, no:0)	1.038	.823	.379	1.262	.212	.128	7.837
One Hour (1:yes, no:0)	1.011	.854	.274	1.184	.241	.214	4.662
Thirty Minutes (1:yes, no:0)	1.746	1.281	.201	1.364	.178	.530	1.886
ENV4	.092	.130	.090	.711	.480	.723	1.383

(every six months and less than 30 minutes have been deleted from the analysis)

See Table 6:28 for full parameter notation
 F-statistics = 2.465
 Significance of F= .010
 R² = .368
 Adjusted R² = .219

Table 6:28 Regression Estimates (Unstandardised) of the INVSDM1 Formation and Process of Strategic Decision-Making Process

INVSDM1=f[-0.071 (Intercept) -0.065 (BODSIZ)+ 0.098 (INTERDIR) -2.385(Once a Year)- 1.674(Quarterly)- 0.694 (Every Six Months) -0.488(Every 15 days)-0.916(Weekly)+1.288(More than Two Hours)+1.351(Two Hours)+1.038(One and a half hour) -1.011(One Hour)+ 1.746(30 minutes) +0.092(ENV4)]

Where:

BODSIZ: Board Size

INTERDIR: Inside Directors

Once a year (1:yes, no:0)

Quarterly (1:yes, no:0)

Every Month (1:yes, no:0)

Every 15 days (1:yes, no:0)

Weekly (1:yes, no:0)

Two Hours (1:yes, no:0)

One and a half hour (1:yes, no:0)

One Hour (1:yes, no:0)

Thirty Minutes (1:yes, no:0)

ENV4: Environmental Complexity-Munificence

Table 6:29 Regression Estimates of the INVSDM2 Formation and Evaluation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-2.560	.635		-4.034	.000		
Board Size	0.072	.051	.196	1.420	.161	.537	1.861
Inside/Internal Board Members	0.007	.073	.012	.092	.927	.596	1.678
Once a year (1:yes, no:0)	-1.446	.842	-.357	-1.717	.092	.236	4.239
Quarterly (1:yes, no:0)	0.176	.784	.061	.224	.824	.136	7.335
Every Month (1:yes, no:0)	0.032	.735	.015	.043	.966	.083	11.999
Every 15 days (1:yes, no:0)	-0.632	.778	-.212	-.813	.420	.150	6.668
Weekly (1:yes, no:0)	1.017	.742	.273	1.371	.176	.257	3.885
More than Two Hours	1.999	.727	.930	2.749	.008	.089	11.207
Two Hours (1:yes, no:0)	2.148	.754	.929	2.848	.006	.096	10.423
One and a half hour (1:yes, no:0)	2.068	.783	.747	2.641	.011	.128	7.837
One Hour (1:yes, no:0)	2.630	.812	.706	3.238	.002	.214	4.662
Thirty Minutes (1:yes, no:0)	2.477	1.218	.282	2.033	.047	.530	1.886
ENV4	-0.099	.123	-.096	-.806	.424	.723	1.383

(every six months and less than 30 minutes have been deleted from the analysis)

See Table 6:30 for full parameter notation

F-statistics = 3.307

Significance of F= .001

R² = .439

Adjusted R² = .306

Table 6:30 Regression Estimates (Unstandardised) of the INVSDM2 Formation and Evaluation of Strategic Decision-Making Process

$$\text{INVSDM2} = f[-2.560 (\text{Intercept}) + 0.072 (\text{BODSIZ}) - 0.007 (\text{INTERDIR}) - 1.446 (\text{Once a Year}) + 0.176 (\text{Quarterly}) + 0.032 (\text{Every Month}) - 0.632 (\text{Every 15 days}) + 1.017 (\text{Weekly}) + 1.999 (\text{More than Two Hours}) + 2.148 (\text{Two Hours}) + 2.068 (\text{One and a half hour}) + 2.630 (\text{One Hour}) + 2.477 (\text{thirty minutes}) - 0.099 (\text{ENV4})]$$

Where:

- BODSIZ: Board Size
- INTERDIR: Inside Directors
- Once a year (1:yes, no:0)
- Quarterly (1:yes, no:0)
- Every Month (1:yes, no:0)
- Every 15 days (1:yes, no:0)
- Weekly (1:yes, no:0)
- Two Hours (1:yes, no:0)
- One and a half hour (1:yes, no:0)
- One Hour (1:yes, no:0)
- Thirty Minutes (1:yes, no:0)
- ENV4: Environmental Complexity-Munificence

Table 6:31 Regression Estimates of the INVSDM3 Evaluation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	0.424	.699		.606	.547		
Board Size	0.064	.056	.186	1.148	.256	.537	1.861
Inside/Internal Board Members	-0.147	.080	-.281	-1.832	.072	.596	1.678
Once a year (1:yes, no:0)	-1.971	.927	-.519	-2.126	.038	.236	4.239
Quarterly (1:yes, no:0)	-1.335	.864	-.496	-1.545	.128	.136	7.335
Every Month (1:yes, no:0)	-0.973	.809	-.494	-1.202	.234	.083	11.999
Every 15 days (1:yes, no:0)	-0.891	.857	-.319	-1.040	.303	.150	6.668
Weekly (1:yes, no:0)	-1.109	.817	-.317	-1.358	.180	.257	3.885
More than Two Hours (1:yes, no:0)	0.509	.801	.252	.636	.527	.089	11.207
Two Hours (1:yes, no:0)	0.596	.831	.275	.718	.476	.096	10.423
One and a half hour (1:yes, no:0)	1.001	.862	.385	1.161	.251	.128	7.837
One Hour (1:yes, no:0)	1.279	.895	.366	1.430	.158	.214	4.662
Thirty Minutes (1:yes, no:0)	1.429	1.342	.173	1.065	.292	.530	1.886
ENV4	-0.107	.136	-.110	-.789	.434	.723	1.383

(every six months and less than 30 minutes have been deleted from the analysis)

See Table 6:32 for full parameter notation

F-statistics = 1.239
 Significance of F= .278
 $R^2 = .227$
 Adjusted $R^2 = .044$

Table 6:32 Regression Estimates (Unstandardised) of the INVSDM3 Evaluation of Strategic Decision-Making Process

INVSDM3=f[0.424 (Intercept) + 0.064(BODSIZ)- 0.147 (INTERDIR) -1.971(Once a Year) -1.335 (Quarterly) - 0.973 (Every Month) -0.891(Every 15 days) -1.109 (Weekly)+ 0.509(More than Two Hours)+ 0.596 (Two Hours)+1.001 (One and a half hour) +1.279 (One Hour)+ 1.429 (thirty minutes) -0.107 (ENV4)]

Where:

BODSIZ: Board Size

INTERDIR: Inside Directors

Once a year (1:yes, no:0)

Quarterly (1:yes, no:0)

Every Month (1:yes, no:0)

Every 15 days (1:yes, no:0)

Weekly (1:yes, no:0)

Two Hours (1:yes, no:0)

One and a half hour (1:yes, no:0)

One Hour (1:yes, no:0)

Thirty Minutes (1:yes, no:0)

ENV4: Environmental Complexity-Munificence

Table 6:33 Regression Estimates of the INVSDM1 Formation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-1.126	.596		-1.890	.064		
Board Size	-0.003	.050	-.007	-.053	.958	.504	1.984
Inside/Internal Board Members	0.063	.071	.116	.884	.381	.550	1.818
Once a year (1:yes, no:0)	-2.809	.781	-.715	-3.597	.001	.239	4.184
Quarterly (1:yes, no:0)	-1.673	.737	-.601	-2.272	.027	.135	7.399
Every Month (1:yes, no:0)	-0.694	.688	-.336	-1.009	.318	.085	11.749
Every 15 days (1:yes, no:0)	-0.881	.728	-.291	-1.210	.232	.163	6.131
Weekly (1:yes, no:0)	-0.313	.694	-.087	-.451	.654	.256	3.905
More than Two Hours (1:yes, no:0)	1.938	.682	.908	2.842	.006	.092	10.817
Two Hours (1:yes, no:0)	2.136	.712	.947	3.000	.004	.095	10.551
One and a half hour (1:yes, no:0)	1.782	.740	.662	2.408	.020	.125	8.000
One Hour (1:yes, no:0)	2.049	.762	.567	2.690	.010	.213	4.701
Thirty Minutes (1:yes, no:0)	2.961	1.117	.348	2.651	.011	.549	1.823
ENV3	0.009	.121	.009	.075	.940	.706	1.416

(every six months and less than 30 minutes have been deleted from the analysis)

See Table 6:34 for full parameter notation

F-statistics = 4.069

Significance of F= .000

R² = .500

Adjusted R² = .377

Table 6:34 Regression Estimates(Unstandardised) of the INVSDM1 Evaluation of Strategic Decision-Making Process

INVSDM1=f[-1.126 (Intercept) -0.003 (BODSIZ)+ 0.063 (INTERDIR) -2.809 (Once a Year) -1.673 (Quarterly) - 0.694 (Every Month) -0.881(Every 15 days) -0.313 (Weekly)+ 1.938 (More than Two Hours)+2.136 (Two Hours)+ 1.782 (One and a half hour) + 2.049 (One Hour)+ 2.961 (thirty minutes) +0.009(ENV3)]

Where:

BODSIZ: Board Size

INTERDIR: Inside Directors

Once a year (1:yes, no:0)

Quarterly (1:yes, no:0)

Every Month (1:yes, no:0)

Every 15 days (1:yes, no:0)

Weekly (1:yes, no:0)

Two Hours (1:yes, no:0)

One and a half hour (1:yes, no:0)

One Hour (1:yes, no:0)

Thirty Minutes (1:yes, no:0)

ENV3: Environmental Complexity/Homogeneity-Heterogeneity

Table 6:35 Regression Estimates of the INVSDM2 Evaluation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-1.194	.578		-2.065	.044		
Board Size	0.083	.048	.249	1.711	.093	.504	1.984
Inside/Internal Board Members	-0.098	.069	-.198	-1.423	.161	.550	1.818
Once a year (1:yes, no:0)	-1.966	.758	-.547	-2.593	.012	.239	4.184
Quarterly (1:yes, no:0)	-0.323	.715	-.127	-.452	.653	.135	7.399
Every Month (1:yes, no:0)	-0.501	.668	-.265	-.750	.456	.085	11.749
Every 15 days (1:yes, no:0)	-0.805	.707	-.291	-1.138	.260	.163	6.131
Weekly (1:yes, no:0)	-0.154	.674	-.047	-.228	.820	.256	3.905
More than Two Hours (1:yes, no:0)	1.316	.662	.674	1.987	.052	.092	10.817
Two Hours (1:yes, no:0)	1.425	.691	.691	2.061	.044	.095	10.551
One and a half hour (1:yes, no:0)	1.807	.734	.734	2.516	.015	.125	8.000
One Hour (1:yes, no:0)	2.273	.740	.687	3.074	.003	.213	4.701
Thirty Minutes (1:yes, no:0)	1.677	1.084	.215	1.547	.128	.549	1.823
ENV3	-0.127	.117	-.133	-1.086	.282	.706	1.416

(every six months and less than 30 minutes have been deleted from the analysis)

See Table 6:36 for full parameter notation

F-statistics = 3.153

Significance of F= .002

R² = .436

Adjusted R² = .29

Table 6:36 Regression Estimates (Unstandardised) of the INVSDM2 Formation of Strategic Decision-Making Process

INVSDM2=f[-1.194(Intercept) +0.083 (BODSIZ) -0.098 (INTERDIR) -1.966 (Once a Year) -0.323 (Quarterly)-0.501(Every Month)-0.805 (Every 15 days) -0.154 (Weekly)+ 1.316(More than Two Hours) +1.425 (Two Hours)+ 1.807 (One and a half hour) + 2.273(One Hour)+ 1.677 (thirty minutes) -0.127(ENV3)]

Where:

BODSIZ: Board Size

INTERDIR: Inside Directors

Once a year (1: yes, no:0)

Quarterly (1: yes, no:0)

Every Month (1:yes, no:0)

Every 15 days (1:yes, no:0)

Weekly (1: yes, no:0)

Two Hours (1:yes, no:0)

One and a half hour (1: yes, no:0)

One Hour (1: yes, no:0)

Thirty Minutes (1:yes, no:0)

ENV3: Environmental Complexity/Homogeneity-Heterogeneity

Table 6:37 Regression Estimates of the Financial Reporting of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.227	.758		-.299	.766		
BSc (1:yes, 0:no)	0.288	.903	.167	.319	.751	.054	18.670
Master's (1:yes, 0:no)	0.552	.938	.333	.588	.559	.046	21.824
PhD (1:yes, 0:no)	0.057	.970	.024	.059	.953	.088	11.329
Engineering (1:yes, 0:no)	-0.130	.737	-.042	-.176	.861	.256	3.899
Sciences (1:yes, 0:no)	-0.371	1.066	-.056	-.348	.729	.574	1.741
Business Administration (1:yes, 0:no)	-0.300	.667	-.163	-.450	.655	.112	8.957
Business (1:yes, 0:no)	-0.167	.656	-.096	-.254	.800	.104	9.657
Social Sciences (1:yes, 0:no)	0.297	.660	.135	.450	.655	.162	6.171
Marketing (1:yes, 0:no)	-1.069	.828	-.273	-1.290	.203	.328	3.053
Functional Background (Thoughtput:0,Output:1)	0.030	.266	.018	.114	.910	.576	1.735
INDTEN	-0.001	.016	-.012	-.066	.948	.444	2.254
COMPTEN	0.010	.019	.105	.564	.575	.427	2.344
POSTEN	0.004	.021	.034	.201	.841	.522	1.915
ENV1	0.342	.124	.407	2.754	.008	.672	1.488
ENV2	0.061	.115	.074	.529	.599	.753	1.329
ENV3	0.134	.101	.170	1.331	.190	.896	1.116
ENV4	0.223	.133	.252	1.673	.101	.645	1.551

(High school and Civil engineering have been deleted from the analysis)

See Table 6:38 for full parameter notation

F-statistics = 1.303

Significance of F= .233

R² = .325

Adjusted R² = .0

Table 6:38 Regression Estimates(Unstandardised) of the Financial Reporting of Strategic Decision-Making Process

$$\text{FINREP}=f [-0.227 (\text{Intercept}) + 0.288(\text{BSc})+ 0.552(\text{Master's})+ 0.057(\text{PhD}) -0.130(\text{Engineering}) - 0.371(\text{Sciences}) -0.300(\text{Business Administration}) -0.167(\text{Business})+ 0.297(\text{Social Sciences}) -1.069(\text{Marketing})+ 0.030(\text{Functional Background})-0.001(\text{INDTEN})+0.010(\text{COMPTEN})+0.004(\text{POSTEN})+ 0.342(\text{ENV1})+0.061(\text{ENV2})+0.134(\text{ENV3})+0.223(\text{ENV4})]$$

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 Functional Background
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism in Marketing Practices
 ENV2:Environmental Customer Dynamism
 ENV3: Environmental Competitor's Dynamism
 ENV4: Environmental Complexity-Munificence

Table 6:39 Regression Estimates of the Financial Reporting of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.200	.759		-.264	.793		
BSc (1:yes, 0:no)	0.370	.903	.214	.410	.684	.054	18.578
Master's (1:yes, 0:no)	0.565	.940	.341	.601	.551	.046	21.804
PhD (1:yes, 0:no)	0.099	.970	.041	.102	.919	.089	11.275
Engineering (1:yes, 0:no)	-0.133	.730	-.043	-.182	.856	.263	3.805
Sciences (1:yes, 0:no)	-0.495	1.066	-.074	-.464	.645	.578	1.731
Business Administration (1:yes, 0:no)	-0.364	.668	-.198	-.545	.588	.112	8.937
Business (1:yes, 0:no)	-0.231	.657	-.132	-.351	.727	.104	9.642
Social Sciences (1:yes, 0:no)	0.248	.663	.113	.373	.710	.161	6.193
Marketing (1:yes, 0:no)	-1.107	.831	-.283	-1.333	.189	.327	3.054
Functional Background (Thoughtput:0,Output:1)	0.075	.262	.045	.287	.776	.598	1.672
INDTEN	-0.002	.016	-.020	-.109	.913	.442	2.261
COMPTEN	0.009	.019	.094	.503	.617	.420	2.380
POSTEN	0.001	.021	.007	.043	.966	.510	1.959
ENV1	0.315	.126	.378	2.498	.016	.645	1.551
ENV2	0.088	.111	.109	.795	.430	.789	1.267
ENV3	0.236	.131	.270	1.808	.077	.661	1.512

(High school and Civil engineering have been deleted from the analysis)

See Table 6:40 for full parameter notation

F-statistics = 1.301

Significance of F= .236

R² = .307

Adjusted R² = .071

Table 6:40 Regression Estimates (Unstandardised) of the Financial Reporting of Strategic Decision-Making Process

$$\text{FINREP} = f [-0.200(\text{Intercept}) + 0.370(\text{BSc}) + 0.565(\text{Master's}) + 0.099(\text{PhD}) - 0.133(\text{Engineering}) - 0.495(\text{Sciences}) - 0.364(\text{Business Administration}) - 0.231(\text{Business}) + 0.248(\text{Social Sciences}) - 1.107(\text{Marketing}) + 0.075(\text{Functional Background}) - 0.002(\text{INDTEN}) + 0.009(\text{COMPTEN}) + 0.001(\text{POSTEN}) + 0.315(\text{ENV1}) + 0.088(\text{ENV2}) + 0.236(\text{ENV3})]$$

Where:

- BSc
- Master's
- PhD
- Engineering
- Sciences
- Business Administration
- Business
- Social Sciences
- Marketing
- Functional Background
- Functional Background
- INDTEN: Industry Tenure
- COMPTEN: Company Tenure
- POSTEN: Position Tenure
- ENV1: Environmental Dynamism
- ENV2: Environmental Munificence/Hostility
- ENV3: Environmental Complexity

Table 6:41 Regression Estimates of the Rule Formalisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.083	.823		-.101	.920		
BSc (1:yes, 0:no)	0.403	.996	.218	.404	.688	.050	19.845
Master's (1:yes, 0:no)	-0.008	1.042	-.005	-.008	.994	.043	23.444
PhD (1:yes, 0:no)	-0.035	1.070	-.014	-.032	.974	.076	13.210
Engineering (1:yes, 0:no)	-0.353	.803	-.111	-.439	.662	.227	4.405
Sciences (1:yes, 0:no)	0.049	1.010	.009	.048	.962	.406	2.464
Business Administration (1:yes, 0:no)	-0.079	.740	-.040	-.107	.916	.103	9.723
Business (1:yes, 0:no)	-0.103	.724	-.056	-.142	.887	.095	10.476
Social Sciences (1:yes, 0:no)	0.105	.743	.041	.141	.888	.170	5.885
Marketing (1:yes, 0:no)	-0.383	.923	-.087	-.415	.680	.328	3.045
Thoughtput:0,Output:1(Functional Background)	0.143	.285	.079	.501	.618	.589	1.698
INDREN	3.88E-005	.017	.000	.002	.998	.414	2.416
COMTEN	-0.004	.020	-.038	-.186	.853	.347	2.882
POSTEN	0.018	.022	.156	.835	.407	.419	2.389
ENV1	0.211	.131	.237	1.612	.113	.675	1.481
ENV2	-0.082	.126	-.092	-.648	.520	.725	1.380
ENV3	0.224	.107	.261	2.088	.042	.931	1.074
ENV4	0.027	.135	.030	.203	.840	.685	1.460

(High school and Civil engineering have been deleted from the analysis)

See Table 6:42 for full parameter notation

F-statistics = .977
 Significance of F= .497
 $R^2 = .242$
 Adjusted $R^2 = -.006$

Table 6:42 Regression Estimates (Unstandardised) of the Rule Formalisation of Strategic Decision-Making Process

RULEFORM=f [-0.083 (Intercept) +0.403 (BSc) -0.008 (Master's) -0.035 (PhD) -0.353 (Engineering) +0.049 (Sciences) -0.079 (Business Administration) -0.103 (Business)+ 0.105 (Social Sciences) -0.383 (Marketing)+ 0.143 (Functional Background)- 3.88E-005 (INDTEN)-0.004 (COMPTEN)+0.018(POSTEN)+ 0.211 (ENV1) - 0.082 (ENV2)+0.224(ENV3)+0.027(ENV4)]

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism in Marketing Practices
 ENV2:Environmental Customer Dynamism
 ENV3: Environmental Competitor's Dynamism
 ENV4: Environmental Complexity-Munificence

Table 6:43 Regression Estimates of the Rule Formalisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.092	.830		-.111	.912		
BSc (1:yes, 0:no)	0.472	1.007	.255	.469	.641	.051	19.784
Master's (1:yes, 0:no)	-0.018	1.053	-.010	-.017	.986	.043	23.405
PhD (1:yes, 0:no)	0.090	1.079	.037	.084	.934	.076	13.094
Engineering (1:yes, 0:no)	-0.192	.810	-.060	-.237	.814	.229	4.369
Sciences (1:yes, 0:no)	0.070	1.017	.013	.069	.945	.410	2.437
Business Administration (1:yes, 0:no)	-0.042	.749	-.021	-.056	.955	.103	9.738
Business (1:yes, 0:no)	-0.096	.733	-.052	-.132	.896	.095	10.476
Social Sciences (1:yes, 0:no)	0.113	.756	.045	.150	.881	.168	5.947
Marketing (1:yes, 0:no)	-0.297	.937	-.068	-.317	.752	.327	3.060
Thoughtput:0,Output:1(Functional Background)	0.109	.287	.060	.380	.706	.595	1.681
INDTEN	-0.001	.017	-.009	-.045	.964	.413	2.419
COMTEN	-0.004	.021	-.041	-.194	.847	.340	2.941
POSTEN	0.015	.022	.125	.655	.515	.411	2.433
ENV1	0.255	.130	.295	1.955	.056	.658	1.520
ENV2	-0.098	.126	-.109	-.779	.440	.768	1.303
ENV3	0.088	.138	.095	.641	.524	.680	1.471

(High school and Civil engineering have been deleted from the analysis)

See Table 6:44 for full parameter notation
 F-statistics = .873
 Significance of F= .602
 $R^2 = .209$
 Adjusted $R^2 = -.030$

Table 6:44 Regression Estimates (Unstandardised) of the Rule Formalisation of Strategic Decision-Making Process

HIERDECENT1=f [-0.092(Intercept) +0.472(BSc)-0.018(Master's)+0.090(PhD) -0.192(Engineering) +0.070(Sciences) -0.042 (Business Administration) -0.096 (Business)+ 0.113 (Social Sciences) -0.297 (Marketing)+ 0.109 (Functional Background) -0.001 (INDTEN) -0.004 (COMPTEN)-0.098(POSTEN)+ 0.255(ENV1)-0.098(ENV2)+0.088(ENV3)]

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 Functional Background
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism
 ENV2:Environmental Munificence/Hostility
 ENV3: Environmental Complexity

Table 6:45 Regression Estimates of the Hierarchical Decentralisation (Lower Level) of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.277	.861		-.322	.749		
BSc (1:yes, 0:no)	-0.956	1.047	-.477	-.914	.365	.050	20.100
Master's (1:yes, 0:no)	-1.336	1.094	-.698	-1.222	.227	.041	24.142
PhD (1:yes, 0:no)	-1.125	1.118	-.423	-1.006	.319	.076	13.092
Engineering (1:yes, 0:no)	1.227	.809	.403	1.515	.136	.191	5.240
Sciences (1:yes, 0:no)	2.361	1.059	.406	2.229	.030	.408	2.453
Business Administration (1:yes, 0:no)	1.473	.781	.667	1.886	.065	.108	9.258
Business (1:yes, 0:no)	1.480	.761	.744	1.946	.057	.093	10.809
Social Sciences (1:yes, 0:no)	1.896	.777	.714	2.440	.018	.158	6.332
Marketing (1:yes, 0:no)	1.812	.968	.379	1.870	.067	.330	3.033
Thoughtput:0,Output:1(Functional Background)	-0.160	.291	-.081	-.551	.584	.623	1.606
INDTEN	0.027	.017	.286	1.604	.115	.426	2.345
COMTEN	0.010	.021	.089	.464	.645	.370	2.704
POSTEN	-0.042	.023	-.331	-1.843	.071	.420	2.383
ENV1	0.148	.132	.155	1.120	.268	.709	1.410
ENV2	0.132	.132	.140	.998	.323	.687	1.455
ENV3	0.073	.113	.077	.646	.521	.939	1.065
ENV4	0.247	.133	.260	1.860	.068	.691	1.448

(High school and Civil engineering have been deleted from the analysis)
 See Table 6:46 for full parameter notation

F-statistics = 1.171
 Significance of F= .318
 R² = .269
 Adjusted R² = .039

Table 6:46 Regression Estimates (Unstandardised) of the Lower Level Hierarchical Decentralisation of Strategic Decision-Making Process

$\text{HIERDECENT1} = f [-0.227 (\text{Intercept}) + 0.288(\text{BSc}) + 0.552(\text{Master's}) + 0.057(\text{PhD}) - 0.130(\text{Engineering}) - 0.371(\text{Sciences}) - 0.300(\text{Business Administration}) - 0.167(\text{Business}) + 0.297(\text{Social Sciences}) - 1.069(\text{Marketing}) + 0.030(\text{Functional Background}) - 0.001(\text{INDTEN}) + 0.010(\text{COMPTEN}) + 0.004 (\text{POSTEN}) + 0.342(\text{ENV1}) + 0.061(\text{ENV2}) + 0.134(\text{ENV3}) + 0.223(\text{ENV4})]$
<p>Where: BSc Master's PhD Engineering Sciences Business Administration Business Social Sciences Marketing Functional Background INDTEN: Industry Tenure COMPTEN: Company Tenure POSTEN: Position Tenure ENV1: Environmental Dynamism in Marketing Practices ENV2: Environmental Customer Dynamism ENV3: Environmental Competitor's Dynamism ENV4: Environmental Complexity-Munificence</p>

Table 6:47 Regression Estimates of the Lower Level Hierarchical Decentralisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient t (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.231	.854		-.271	.788		
BSc (1:yes, 0:no)	-0.975	1.040	-.486	-.937	.353	.050	20.017
Master's (1:yes, 0:no)	-1.376	1.088	-.719	-1.265	.211	.042	24.088
PhD (1:yes, 0:no)	-1.145	1.109	-.431	-1.033	.306	.077	13.003
Engineering (1:yes, 0:no)	1.259	.808	.414	1.559	.125	.190	5.265
Sciences (1:yes, 0:no)	2.361	1.050	.406	2.249	.029	.411	2.433
Business Administration (1:yes, 0:no)	1.485	.779	.673	1.906	.062	.108	9.291
Business (1:yes, 0:no)	1.471	.757	.740	1.943	.057	.093	10.810
Social Sciences (1:yes, 0:no)	1.900	.777	.715	2.446	.018	.157	6.378
Marketing (1:yes, 0:no)	1.839	.967	.385	1.903	.062	.328	3.048
Thoughtput:0,Output:1(Functional Background)	-0.161	.289	-.081	-.555	.581	.623	1.604
INDTEN	0.027	.017	.284	1.599	.115	.426	2.347
COMTEN	0.009	.021	.084	.436	.665	.364	2.748
POSTEN	-0.044	.023	-.345	-1.909	.062	.411	2.430
ENV1	0.129	.132	.139	.977	.333	.667	1.500
ENV2	0.171	.127	.180	1.344	.184	.749	1.336
ENV3	0.229	.136	.236	1.687	.097	.686	1.457

(High school and Civil engineering have been deleted from the analysis)

See Table 6:48 for full parameter notation

F-statistics = 1.224

Significance of F= .280

R² = .263

Adjusted R² = .04

Table 6:48 Regression Estimates (Unstandardised) of the Lower Level Hierarchical Decentralization of Strategic Decision-Making Process

<p>HIERDECENT1=f [-0.231(Intercept) -0.975(BSc)-1.376(Master's)-1.145(PhD) +1.259(Engineering) +2.361(Sciences) +1.485(Business Administration) -1.471(Business)+1.900(Social Sciences) +1.839(Marketing)-0.161(Functional Background)+0.027(INDTEN)-0.009(COMPTEN)-0.044(POSTEN)+0.129(ENV1)+0.171(ENV2)+0.229(ENV3)]</p> <p>Where: BSc Master's PhD Engineering Sciences Business Administration Business Social Sciences Marketing Functional Background Functional Background INDTEN: Industry Tenure COMPTEN: Company Tenure POSTEN: Position Tenure ENV1: Environmental Dynamism ENV2:Environmental Munificence/Hostility ENV3: Environmental Complexity</p>
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Table 6:49 Regression Estimates of the Upper Level Hierarchical Decentralisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	1.014	.770		1.317	.193		
BSc (1:yes, 0:no)	-0.286	.936	-.158	-.305	.761	.050	20.100
Master's (1:yes, 0:no)	-0.733	.978	-.424	-.749	.457	.041	24.142
PhD (1:yes, 0:no)	-1.344	.999	-.561	-1.344	.184	.076	13.092
Engineering (1:yes, 0:no)	0.361	.724	.132	.499	.620	.191	5.240
Sciences (1:yes, 0:no)	0.848	.947	.162	.895	.375	.408	2.453
Business Administration (1:yes, 0:no)	-0.233	.698	-.117	-.334	.740	.108	9.258
Business (1:yes, 0:no)	-0.234	.680	-.131	-.345	.732	.093	10.809
Social Sciences (1:yes, 0:no)	-0.056	.695	-.023	-.081	.936	.158	6.332
Marketing (1:yes, 0:no)	0.339	.866	.079	.392	.697	.330	3.033
Thoughtput:0,Output:1(Functional Background)	0.146	.260	.082	.561	.577	.623	1.606
INDTEN	-0.012	.015	-.145	-.823	.414	.426	2.345
COMTEN	-0.008	.019	-.079	-.419	.677	.370	2.704
POSTEN	-0.002	.020	-.014	-.078	.938	.420	2.383
ENV1	0.063	.118	.073	.532	.597	.709	1.410
ENV2	0.180	.118	.212	1.523	.134	.687	1.455
ENV3	-0.064	.101	-.075	-.631	.530	.939	1.065
ENV4	0.054	.119	.063	.453	.652	.691	1.448

(High school and Civil engineering have been deleted from the analysis)

See Table 6:50 for full parameter notation

F-statistics = 1.248

Significance of F= .261

R² = .282

Adjusted R² = .056

Table 6:50 Regression Estimates(Unstandardised) of the Upper Level Hierarchical Decentralisation of Strategic Decision-Making Process

$$\text{HIERDECENT2} = f [1.014 (\text{Intercept}) -0.286 (\text{BSc}) -0.733 (\text{Master's}) -1.344 (\text{PhD}) -0.361 (\text{Engineering}) -0.848 (\text{Sciences}) -0.233 (\text{Business Administration}) -0.234 (\text{Business}) -0.056 (\text{Social Sciences}) +0.339 (\text{Marketing}) +0.146 (\text{Functional Background}) -0.012 (\text{INDTEN}) -0.008 (\text{COMPTEN}) -0.002 (\text{POSTEN}) +0.063 (\text{ENV1}) +0.180 (\text{ENV2}) -0.064 (\text{ENV3}) +0.054 (\text{ENV4})]$$

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism in Marketing Practices
 ENV2: Environmental Customer Dynamism
 ENV3: Environmental Competitor's Dynamism
 ENV4: Environmental Complexity-Munificence

Table 6:51 Regression Estimates of the Upper Level Hierarchical Decentralisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	1.054	.761		1.385	.172		
BSc (1:yes, 0:no)	-0.243	.927	-.134	-.262	.794	.050	20.017
Master's (1:yes, 0:no)	-0.697	.969	-.404	-.719	.475	.042	24.088
PhD (1:yes, 0:no)	-1.370	.988	-.572	-1.386	.171	.077	13.003
Engineering (1:yes, 0:no)	0.259	.720	.095	.360	.720	.190	5.265
Sciences (1:yes, 0:no)	0.722	.936	.138	.772	.444	.411	2.433
Business Administration (1:yes, 0:no)	-0.353	.694	-.178	-.509	.613	.108	9.291
Business (1:yes, 0:no)	-0.331	.675	-.184	-.490	.626	.093	10.810
Social Sciences (1:yes, 0:no)	-0.174	.692	-.073	-.251	.803	.157	6.378
Marketing (1:yes, 0:no)	0.188	.862	.044	.218	.828	.328	3.048
Thoughtput:0,Output:1(Functional Background)	0.213	.258	.120	.826	.412	.623	1.604
INDTEN	-0.012	.015	-.140	-.797	.429	.426	2.347
COMTEN	-0.011	.019	-.113	-.595	.554	.364	2.748
POSTEN	0.001	.020	.011	.063	.950	.411	2.430
ENV1	0.053	.118	.063	.448	.656	.667	1.500
ENV2	0.206	.113	.241	1.820	.074	.749	1.336
ENV3	-0.020	.121	-.023	-.166	.868	.686	1.457

(High school and Civil engineering have been deleted from the analysis)
 See Table 6:52 for full parameter notation

F-statistics = 1.337
 Significance of F= .209
 R² = .280
 Adjusted R² = .071

Table 6:52 Regression Estimates (Unstandardised) of the Upper Hierarchical Decentralization of Strategic Decision-Making Process

$$\text{HIERDECENT2} = f [1.054(\text{Intercept}) - 0.243(\text{BSc}) - 0.697(\text{Master's}) - 1.370(\text{PhD}) + 0.259(\text{Engineering}) + 0.722(\text{Sciences}) - 0.0353(\text{Business Administration}) - 0.331(\text{Business}) - 0.174(\text{Social Sciences}) + 0.188(\text{Marketing}) + 0.213(\text{Functional Background}) - 0.012(\text{INDTEN}) - 0.011(\text{COMPTEN}) + 0.001(\text{POSTEN}) + 0.053(\text{ENV1}) - 0.0206(\text{ENV2}) - 0.020(\text{ENV3})]$$

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 Functional Background
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism
 ENV2: Environmental Munificence/Hostility
 ENV3: Environmental Complexity

Table 6:53 Regression Estimates of the Hierarchical Decentralisation of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	0.491	.795		.618	.539		
BSc (1:yes, 0:no)	-0.907	.968	-.469	-1.487	.143	.042	24.088
Master's (1:yes, 0:no)	-1.505	1.012	-.817	-1.700	.095	.077	13.003
PhD (1:yes, 0:no)	-1.755	1.032	-.686	-1.700	.095	.077	13.003
Engineering (1:yes, 0:no)	1.137	.752	.388	1.513	.136	.190	5.265
Sciences (1:yes, 0:no)	2.282	.977	.408	2.335	.023	.411	2.433
Business Administration (1:yes, 0:no)	0.922	.725	.434	1.272	.209	.108	9.291
Business (1:yes, 0:no)	0.926	.705	.483	1.314	.194	.093	10.810
Social Sciences (1:yes, 0:no)	1.357	.723	.530	1.877	.066	.157	6.378
Marketing (1:yes, 0:no)	1.540	.900	.334	1.711	.093	.328	3.048
Thoughtput:0,Output:1(Functional Background)	0.011	.269	.006	.042	.967	.623	1.604
INDTEN	0.013	.016	.144	.842	.404	.426	2.347
COMTEN	-5.60E-006	.019	.000	.000	1.000	.364	2.748
POSTEN	-0.033	.021	-.270	-1.545	.128	.411	2.430
ENV1	0.133	.123	.148	1.083	.283	.667	1.500
ENV2	0.262	.118	.287	2.223	.030	.749	1.336
ENV3	0.164	.126	.175	1.299	.199	.686	1.457

(High school and Civil engineering have been deleted from the analysis)
 See Table 6:54 for full parameter notation

F-statistics = 1.555
 Significance of F= .114
 R² = .311
 Adjusted R² = .111

Table 6:54 Regression Estimates (Unstandardised) of the Hierarchical Decentralization of Strategic Decision-Making Process

HIERDECENT=f [0.491(Intercept) -0.2(BSc)-1.505(Master's)-1.775(PhD) +1.137(Engineering) +2.282(Sciences) +0.922(Business Administration) -0.926(Business)+1.357(Social Sciences) +1.540(Marketing)+ 0.011(Functional Background)-0.013(INDTEN) -5.60E-006 (COMPTEEN)-0.033(POSTEN)+ 0.133(ENV1)+0.262(ENV2)+0.164(ENV3)]

Where:
 BSc
 Master's
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 Functional Background
 Functional Background
 INDTEN: Industry Tenure
 COMPTEEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism
 ENV2:Environmental Munificence/Hostility
 ENV3: Environmental Complexity

Table 6:55 Regression Estimates of the Lateral Communication of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.928	.834		-1.112	.272		
BSc (1:yes, 0:no)	0.165	.994	.077	.166	.869	.056	17.919
Master's (1:yes, 0:no)	-0.362	1.050	-.180	-.345	.732	.044	22.880
PhD (1:yes, 0:no)	-0.247	1.095	-.085	-.226	.822	.084	11.859
Engineering (1:yes, 0:no)	0.764	.763	.250	1.000	.322	.192	5.218
Sciences (1:yes, 0:no)	1.447	1.009	.248	1.434	.158	.397	2.520
Business Administration (1:yes, 0:no)	0.592	.749	.248	.791	.433	.121	8.252
Business (1:yes, 0:no)	0.751	.729	.357	1.030	.308	.099	10.068
Social Sciences (1:yes, 0:no)	0.903	.744	.324	1.215	.231	.167	5.973
Marketing (1:yes, 0:no)	1.069	.916	.223	1.167	.249	.327	3.062
Throughput:0,Output:1(Functional Background)	0.162	.301	.077	.536	.594	.580	1.723
INDTEN	0.024	.017	.243	1.449	.154	.422	2.369
COMTEN	-0.001	.020	-.009	-.048	.962	.371	2.697
POSTEN	-0.005	.022	-.035	-.214	.832	.435	2.298
ENV1	0.402	.129	.419	3.106	.003	.655	1.528
ENV2	-0.033	.132	-.033	-.248	.805	.691	1.447
ENV3	0.174	.115	.170	1.511	.138	.940	1.063
ENV4	0.314	.132	.319	2.372	.022	.661	1.514

(High school and Civil engineering have been deleted from the analysis)
 See Table 6:56 for full parameter notation

F-statistics = 2.171
 Significance of F= .019
 $R^2 = .440$
 Adjusted $R^2 = .237$

Table 6:56 Regression Estimates (Unstandardised) of the Lateral Communication of Strategic Decision-Making Process

LATCOMM=f [-0.928 (Intercept) +0.165 (BSc)-0.362 (Master's)-0.247(PhD) +0.764(Engineering) +1.447(Sciences) +0.592(Business Administration) +1.447(Business)+0.903 (Social Sciences) 1.069 (Marketing)+ 0.162(Functional Background)+0.024(INDTEN) -0.001 (COMPTEN) -0.005 (POSTEN)+ 0.402 (ENV1) -0.033 (ENV2)- 0.174(ENV3)+0.314(ENV4)]

Where:

BSc

Master's

PhD

Engineering

Sciences

Business Administration

Business

Social Sciences

Marketing

Functional Background

INDTEN: Industry Tenure

COMPTEN: Company Tenure

POSTEN: Position Tenure

ENV1: Environmental Dynamism in Marketing Practices

ENV2:Environmental Customer Dynamism

ENV3: Environmental Competitor's Dynamism

ENV4: Environmental Complexity-Munificence

Table 6:57 Regression Estimates of the Lateral Communication of Strategic Decision-Making Process

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.906	.818		-1.107	.274		
BSc (1:yes, 0:no)	0.170	.975	.079	.175	.862	.056	17.820
Master's (1:yes, 0:no)	-0.410	1.032	-.204	-.398	.693	.044	22.796
PhD (1:yes, 0:no)	-0.213	1.073	-.073	-.199	.843	.085	11.761
Engineering (1:yes, 0:no)	0.912	.754	.298	1.210	.232	.190	5.253
Sciences (1:yes, 0:no)	1.473	.988	.253	1.490	.143	.401	2.495
Business Administration (1:yes, 0:no)	0.713	.739	.299	.964	.340	.120	8.309
Business (1:yes, 0:no)	0.798	.716	.380	1.115	.271	.100	10.043
Social Sciences (1:yes, 0:no)	1.007	.736	.361	1.369	.177	.166	6.034
Marketing (1:yes, 0:no)	1.221	.903	.255	1.352	.183	.325	3.077
Thoughtput:0,Output:1(Functional Background)	0.104	.299	.049	.348	.730	.570	1.754
INDTEN	0.023	.016	.235	1.421	.162	.422	2.372
COMTEN	0.001	.020	.008	.047	.963	.364	2.744
POSTEN	-0.011	.022	-.083	-.508	.614	.430	2.328
ENV1	0.346	.130	.357	2.660	.011	.641	1.561
ENV2	-0.027	.131	-.027	-.210	.835	.688	1.453
ENV3	0.426	.129	.428	3.303	.002	.686	1.458

(High school and Civil engineering have been deleted from the analysis)
See Table 6:58 for full parameter notation

F-statistics = 2.413
Significance of F= .010
R² = .446
Adjusted R² = .26

Table 6:58 Regression Estimates(Unstandardised) of the Lateral Communication of Strategic Decision-Making Process

$$LATCOMM=f [-0.906(Intercept) +0.170(BSc)-1.410(Master's)-0.213(PhD)+ 0.912 (Engineering) - 1.473 (Sciences) + 0.713 (Business Administration) +0.798 (Business)+ 1.007 (Social Sciences) + 1.221 (Marketing)+ 0.104 (Functional Background)+ 0.023 (INDTEN) +0.001 (COMPTEN) -0.011 (POSTEN)+ 0.346(ENV1)-0.027(ENV2)+0.426(ENV3)]$$

Where:
BSc
Master's
PhD
Engineering
Sciences
Business Administration
Business
Social Sciences
Marketing
Functional Background
Functional Background
INDTEN: Industry Tenure
COMPTEN: Company Tenure
POSTEN: Position Tenure
ENV1: Environmental Dynamism
ENV2:Environmental Munificence/Hostility
ENV3: Environmental Complexity

Table 6:59 Regression Estimates of the Product and Process Innovation Strategies

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.030	1.043		-.029	.977		
OUTDIR	0.126	.098	.191	1.290	.205	.572	1.750
AGED	-0.040	.019	-.434	-2.037	.049	.277	3.613
FEMREPRES	0.078	.164	.069	.477	.636	.602	1.661
INDTEN	0.017	.020	.186	.867	.391	.275	3.642
COMTEN	0.015	.019	.148	.780	.440	.348	2.874
POSTEN	0.039	.023	.334	1.732	.091	.339	2.953
ENV1	0.357	.125	.402	2.862	.007	.639	1.566
ENV2	-0.137	.154	-.126	-.885	.382	.622	1.609
ENV3	0.376	.134	.418	2.807	.008	.567	1.762
ENV4	0.300	.149	.307	2.016	.051	.543	1.842
BSc (1:yes, 0:no)	0.187	1.004	.094	.186	.854	.049	20.469
Masters (1:yes, 0:no)	0.571	1.073	.303	.533	.597	.039	25.707
PhD (1:yes, 0:no)	0.965	1.092	.371	.884	.382	.071	14.030
Engineering (1:yes, 0:no)	0.275	.994	.082	.276	.784	.143	6.990
Sciences (1:yes, 0:no)	0.118	1.096	.023	.107	.915	.279	3.590
Business Administration (1:yes, 0:no)	0.110	.898	.052	.122	.903	.069	14.455
Business (1:yes, 0:no)	0.519	.908	.265	.572	.571	.058	17.114
Social Sciences (1:yes, 0:no)	0.487	.904	.187	.538	.593	.104	9.626
Marketing (1:yes, 0:no)	0.344	1.057	.067	.326	.747	.299	3.341

(High school and Civil engineering have been deleted from the analysis)

See Table 6:60 for full parameter notation

F-statistics = 2.186

Significance of F= .020

R² = .522

Adjusted R² = .283

Table 6:60 Regression Estimates (Unstandardised) of the Product and Process Innovation Strategies

INN1=f [-0.030 (Intercept) +0.126 (OUTDIR)-0.040 (AGED)+0.078(FEMREPRES) +0.017 (INDTEN)-0.015 (COMPTEN)+0.039(POSTEN)+0.187 (BSc) +0.571 (Master’s) +0.965 (PhD) +0.275 (Engineering) +0.118 (Sciences) +0.110 (Business Administration) +0.519(Business)+ 0.487 (Social Sciences) +0.344 (Marketing)+ 0.357 (ENV1) -0.137(ENV2)+0.376(ENV3)+0.300(ENV4)]

Where:

BSc

Master’s

PhD

Engineering

Sciences

Business Administration

Business

Social Sciences

Marketing

AGED: Age of Directors

OUTDIR: Outside directors

FEMREPRES: Female representation

INDTEN: Industry Tenure

COMPTEN: Company Tenure

POSTEN: Position Tenure

ENV1: Environmental Dynamism in Marketing Practices

ENV2:Environmental Customer Dynamism

ENV3: Environmental Competitor’s Dynamism

ENV4: Environmental Complexity-Munificence

INN1:Product and Process Innovation

Table 6:61 Regression Estimates of the Organisational Innovation Strategies

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	0.815	1.347		.605	.549		
OUTDIR	-0.051	.126	-.074	-.404	.689	.572	1.750
AGED	0.012	.025	.131	.497	.622	.277	3.613
FEMREPRES	-0.284	.212	-.239	-1.341	.188	.602	1.661
INDTEN	0.005	.025	.050	.190	.850	.275	3.642
COMPTEN	0.012	.025	.116	.495	.623	.348	2.874
POSTEN	-0.037	.029	-.303	-1.274	.211	.339	2.953
ENV1	0.119	.161	.128	.740	.464	.639	1.566
ENV2	0.067	.199	.059	.334	.740	.622	1.609
ENV3	-0.051	.173	-.054	-.293	.771	.567	1.762
ENV4	-0.017	.192	-.017	-.089	.929	.543	1.842
BSc (1:yes, 0:no)	-0.114	1.297	-.055	-.088	.930	.049	20.469
Masters (1:yes, 0:no)	-0.481	1.385	-.243	-.347	.731	.039	25.707
PhD (1:yes, 0:no)	-0.562	1.410	-.207	-.399	.692	.071	14.030
Engineering (1:yes, 0:no)	-0.838	1.284	-.239	-.653	.518	.143	6.990
Sciences (1:yes, 0:no)	0.532	1.415	.099	.376	.709	.279	3.590
Business Administration (1:yes, 0:no)	-0.378	1.159	-.171	-.326	.746	.069	14.455
Business (1:yes, 0:no)	-0.623	1.173	-.304	-.531	.598	.058	17.114
Social Sciences (1:yes, 0:no)		1.168	-.286	-.667	.509	.104	9.626
Marketing (1:yes, 0:no)	-0.041	1.365	-.008	-.030	.976	.299	3.341

(High school and Civil engineering have been deleted from the analysis)

See Table 6:62 for full parameter notation

F-statistics = .748

Significance of F= .748

R² = .272

Adjusted R² = -.092

Table 6:62 Regression Estimates(Unstandardised) of the Organisational Innovation Strategies

INN2=f [0.815 (Intercept) -0.051 (OUTDIR)+0.012 (AGED) -0.284 (FEMREPRES) +0.005 (INDTEN)+0.005 (COMPTEN)+0.012(POSTEN)-0.114 (BSc) -0.481 (Master's) -0.562 (PhD) -0.838 (Engineering) + 0.532 (Sciences) -0.378 (Business Administration) -0.623 (Business) -0.779 (Social Sciences) -0.041 (Marketing)+ 0.119(ENV1) +0.067(ENV2)-0.051(ENV3)-0.017(ENV4)]

Where

BSc

Master's

PhD

Engineering

Sciences

Business Administration

Business

Social Sciences

Marketing

AGED: Age of Directors

OUTDIR: Outside directors

FEMREPRES: Female representation

INDTEN: Industry Tenure

COMPTEN: Company Tenure

POSTEN: Position Tenure

ENV1: Environmental Dynamism in Marketing Practices

ENV2:Environmental Customer Dynamism

ENV3: Environmental Competitor's Dynamism

ENV4: Environmental Complexity-Munificence

INN2:Organisational Innovation

Table 6:63 Regression Estimates of the Product Innovation Strategies

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-1.100	1.159		-.949	.348		
OUTDIR	-0.005	.107	-.008	-.049	.961	.615	1.627
AGED	-0.023	.022	-.263	-1.073	.290	.288	3.476
FEMREPRES	-0.044	.167	-.040	-.262	.794	.746	1.340
INDTEN	0.029	.022	.331	1.340	.188	.283	3.529
COMTEN	-0.010	.022	-.105	-.466	.644	.342	2.928
POSTEN	0.049	.026	.433	1.893	.066	.330	3.028
ENV1	0.211	.156	.250	1.357	.183	.508	1.970
ENV2	0.131	.174	.128	.751	.457	.596	1.679
ENV3	0.324	.156	.336	2.076	.045	.660	1.516
BSc (1:yes, 0:no)	0.491	1.138	.256	.431	.669	.049	20.472
Masters (1:yes, 0:no)	0.814	1.213	.446	.671	.506	.039	25.643
PhD (1:yes, 0:no)	1.054	1.234	.419	.854	.398	.072	13.966
Engineering (1:yes, 0:no)	1.029	1.123	.317	.916	.366	.144	6.958
Sciences (1:yes, 0:no)	0.125	1.237	.025	.101	.920	.280	3.568
Business Administration (1:yes, 0:no)	0.993	1.017	.488	.976	.335	.069	14.461
Business (1:yes, 0:no)	0.766	1.029	.405	.744	.461	.058	17.123
Social Sciences (1:yes, 0:no)	1.204	1.021	.480	1.180	.245	.105	9.565
Marketing (1:yes, 0:no)	0.950	1.193	.191	.796	.431	.301	3.318

(High school and Civil engineering have been deleted from the analysis)

See Table 6:64 for full parameter notation

F-statistics = 1.048
 Significance of F= .434
 $R^2 = .326$
 Adjusted $R^2 = .015$

Table 6:64 Regression Estimates(Unstandardised) of the Product Innovation Strategies

INNPD=f [-1.100 (Intercept) +0.005 (OUTDIR)-0.023 (AGED) -0.044(FEMREPRES) +0.029 (INDTEN)-0.010 (COMPTEN)+0.049(POSTEN)+0.049 (BSc) +0.814 (Master’s) +1.054 (PhD) +1.029(Engineering) + 0.125(Sciences) +0.993 (Business Administration) +0.766 (Business) +1.204 (Social Sciences) +0.950 (Marketing)+ 0.211(ENV1) +0.131(ENV2)+0.324(ENV3)]

Where
 BSc
 Master’s
 PhD
 Engineering
 Sciences
 Business Administration
 Business
 Social Sciences
 Marketing
 AGED: Age of Directors
 OUTDIR: Outside directors
 FEMREPRES: Female representation
 INDTEN: Industry Tenure
 COMPTEN: Company Tenure
 POSTEN: Position Tenure
 ENV1: Environmental Dynamism
 ENV2:Environmental Munificence/Hostility
 ENV3: Environmental Complexity
 INNVPD: Product Innovation

Table 6:65 Regression Estimates of the Process Innovation Strategies

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	2.404	1.246		1.929	.061		
OUTDIR	0.113	.115	.151	.985	.331	.615	1.627
AGED	-0.056	.023	-.544	-2.429	.020	.288	3.476
FEMREPRES	-0.070	.179	-.054	-.390	.699	.746	1.340
INDTEN	0.004	.023	.041	.183	.855	.283	3.529
COMPTEN	0.044	.024	.379	1.843	.073	.342	2.928
POSTEN	-0.009	.028	-.065	-.311	.757	.330	3.028
ENV1	0.284	.167	.286	1.697	.098	.508	1.970
ENV2	-0.280	.187	-.232	-1.492	.144	.596	1.679
ENV3	0.332	.168	.293	1.979	.055	.660	1.516
BSc (1:yes, 0:no)	-0.506	1.224	-.225	-.414	.681	.049	20.472
Masters (1:yes, 0:no)	-0.261	1.305	-.122	-.200	.842	.039	25.643
PhD (1:yes, 0:no)	0.292	1.327	.099	.220	.827	.072	13.966
Engineering (1:yes, 0:no)	-0.256	1.208	-.067	-.212	.833	.144	6.958
Sciences (1:yes, 0:no)	0.247	1.331	.042	.185	.854	.280	3.568
Business Administration (1:yes, 0:no)	-0.781	1.094	-.326	-.714	.479	.069	14.461
Business (1:yes, 0:no)	0.042	1.107	.019	.038	.970	.058	17.123
Social Sciences (1:yes, 0:no)	-0.358	1.098	-.121	-.326	.746	.105	9.565
Marketing (1:yes, 0:no)	-0.339	1.283	-.058	-.264	.793	.301	3.318

(High school and Civil engineering have been deleted from the analysis)

See Table 6:66 for full parameter notation

F-statistics = 1.678

Significance of F=.087

R² = .436

Adjusted R² = .176

Table 6:66 Regression Estimates (Unstandardised) of the Process Innovation Strategies

$$\text{INNPC} = f [2.404 (\text{Intercept}) + 0.113(\text{OUTDIR}) - 0.056 (\text{AGED}) - 0.070(\text{FEMREPRES}) + 0.004 (\text{INDTEN}) + 0.044 (\text{COMPTEN}) - 0.009(\text{POSTEN}) + 0.506 (\text{BSc}) - 0.261 (\text{Master's}) + 0.292 (\text{PhD}) - 0.256(\text{Engineering}) + 0.247(\text{Sciences}) - 0.781 (\text{Business Administration}) + 0.042(\text{Business}) - 0.358 (\text{Social Sciences}) - 0.339 (\text{Marketing}) + 0.284(\text{ENV1}) - 0.280(\text{ENV2}) + 0.332(\text{ENV3})]$$

Where

BSc

Master's

PhD

Engineering

Sciences

Business Administration

Business

Social Sciences

Marketing

AGED: Age of Directors

OUTDIR: Outside directors

FEMREPRES: Female representation

INDTEN: Industry Tenure

COMPTEN: Company Tenure

POSTEN: Position Tenure

ENV1: Environmental Dynamism

ENV2: Environmental Munificence/Hostility

ENV3: Environmental Complexity

INNVC: Process Innovation

Table 6:67 Regression Estimates of the Organisational Innovation Strategies

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	0.162	1.306		.124	.902		
OUTDIR	-0.062	.120	-.090	-.515	.610	.615	1.627
AGED	0.026	.024	.269	1.058	.297	.288	3.476
FEMREPRES	-0.218	.188	-.183	-1.162	.252	.746	1.340
INDTEN	0.004	.025	.037	.144	.887	.283	3.529
COMTEN	0.004	.025	.038	.162	.872	.342	2.928
POSTEN	-0.035	.029	-.283	-1.191	.241	.330	3.028
ENV1	0.071	.175	.077	.405	.688	.508	1.970
ENV2	0.075	.196	.068	.383	.704	.596	1.679
ENV3	-0.052	.176	-.050	-.296	.769	.660	1.516
BSc (1:yes, 0:no)	0.017	1.282	.008	.013	.990	.049	20.472
Masters (1:yes, 0:no)	-0.397	1.367	-.200	-.290	.773	.039	25.643
PhD (1:yes, 0:no)	-0.619	1.390	-.227	-.446	.658	.072	13.966
Engineering (1:yes, 0:no)	-0.841	1.266	-.239	-.664	.510	.144	6.958
Sciences (1:yes, 0:no)	0.442	1.394	.082	.317	.753	.280	3.568
Business Administration (1:yes, 0:no)	-0.196	1.146	-.089	-.171	.865	.069	14.461
Business (1:yes, 0:no)	-0.629	1.159	-.306	-.542	.591	.058	17.123
Social Sciences (1:yes, 0:no)	-0.707	1.150	-.259	-.615	.542	.105	9.565
Marketing (1:yes, 0:no)	0.018	1.344	.003	.013	.989	.301	3.318

(High school and Civil engineering have been deleted from the analysis)

See Table 6:68 for full parameter notation

F-statistics = .821
 Significance of F=.666
 $R^2 = .275$
 Adjusted $R^2 = -.060$

Table 6:68 Regression Estimates (Unstandardised) of the Organisation Innovation Strategies

$INNORG=f$ [0.162 (Intercept) -0.062 (OUTDIR)+0.026 (AGED) -0.218(FEMREPRES) +0.004(INDTEN)+0.004 (COMPTEN)-0.035(POSTEN)+0.017(BSc) -0.397 (Master's) -0.619 (PhD) - 0.841(Engineering) +0.442(Sciences) -0.196 (Business Administration) -0.629(Business) -0.707 (Social Sciences) +0.018 (Marketing)+ 0.071(ENV1) +0.075(ENV2)-0.052(ENV3)]

Where

- BSc
- Master's
- PhD
- Engineering
- Sciences
- Business Administration
- Business
- Social Sciences
- Marketing
- AGED: Age of Directors
- OUTDIR: Outside directors
- FEMREPRES: Female representation
- INDTEN: Industry Tenure
- COMPTEN: Company Tenure
- POSTEN: Position Tenure
- ENV1: Environmental Dynamism
- ENV2:Environmental Munificence/Hostility
- ENV3: Environmental Complexity
- INNORG: Organisation Innovation

Table 6:69 Regression Estimates of the Organisational Performance

Parameter	Partial regression coefficient t (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.085	.159		-.531	.599		
INVSDM1FORMPROCESSSDM	-0.140	.142	-.167	-.987	.330	.745	1.343
INVSDM2FOREVOFSDM	0.012	.141	.014	.082	.935	.712	1.404
INVSDM3EVSDM	-0.004	.160	-.004	-.027	.979	.830	1.206
FINREPORTING	0.475	.214	.454	2.223	.033	.509	1.966
RULEFORM	0.009	.208	.010	.044	.965	.445	2.248
HIERDECENTR1	0.126	.217	.111	.582	.564	.580	1.725
HIERADECENTR2	-0.086	.217	-.073	-.394	.696	.628	1.593
LATCOMM	-0.009	.210	-.009	-.043	.966	.486	2.059
PRODPROCINNOV	0.034	.216	.031	.158	.875	.547	1.827
ORGINN	0.040	.233	.041	.173	.864	.385	2.595

See Table 6:70 for full parameter notation

F-statistics = 1.108
 Significance of F= .383
 $R^2 = .235$
 Adjusted $R^2 = .023$

Table 6:70 Regression Estimates(Unstandardised) of the Organisational Performance

$ORGP\text{ERF} = f [-0.085 (\text{Intercept}) -0.140 (\text{INVSDM1}) + 0.012 (\text{INVSDM2}) - 0.004 (\text{INVSDM3}) + 0.475 (\text{FINREPORTING}) + 0.009 (\text{RULEFORM}) + 0.126 (\text{HIERDECENTR1}) - 0.086 (\text{HIERADECENTR2}) - 0.009 (\text{LATCOMM}) + 0.034 (\text{PRODPROCINNOV}) + 0.040 (\text{ORGINN})]$

Where:

- INVSDM1 Formation and Process of SDM
- INVSDM2 Formation and Evaluation of SDM
- INVSDM3 Evaluation of SDM
- FINREP: Financial Reporting
- RULEFORM: Rule Formalisation
- HIERDECENTR1: Lower Level Management
- HIERDECENTR2: Upper Level Management
- LATCOM: Lateral Communication
- INN1: Product & Process Innovation
- INN2: Organisational Innovation

Table 6:71 Regression Estimates of the Organisational Performance

Parameter	Partial regression coefficient (B)	Standard error	Standardized regression coefficient (Beta)	t-statistic	Sig.	Tolerance	VIF
Intercept	-0.089	.158		-.561	.579		
INVSDM1FORMATION OF SDM	-0.145	.147	-.167	-.986	.331	.747	1.338
INVSDM2EVALUATION OF SDM	0.193	.141	.210	1.363	.182	.906	1.104
FINREPORTING	0.523	.202	.500	2.590	.014	.574	1.741
RULEFORM	-0.074	.208	-.075	-.358	.722	.487	2.052
HIERDECENTR	0.052	.247	.043	.210	.835	.514	1.947
LATCOMM	0.005	.207	.005	.026	.980	.517	1.934
PRODINN	-0.005	.187	-.005	-.025	.980	.641	1.560
PROCINN	0.083	.186	.084	.448	.657	.605	1.654
ORGINN	0.046	.225	.046	.207	.838	.425	2.354

See Table 6:72for full parameter notation

F-statistics = 1.295
Significance of F= .274
 $R^2 = .250$
Adjusted $R^2 = .057$

Table 6:72 Regression Estimates(Unstandardised) of the Organisational Performance

ORGPERF=f [-0.085 (Intercept) -0.145 (INVSDM1)+0.193(INVSDM2+0.523(FINREPORTING)-
0.074(RULEFORM)+0.052(HIERDECENTR)+0.005(LATCOMM)-
0.005(PRODINN)+0.083(PROCINN)+0.046(ORGINN)]

Where:

INVSDM1: Formation and Process of SDM
INVSDM2 :Evaluation of SDM
FINREP: Financial Reporting
RULEFORM: Rule Formalisation
HIERDECENT: Hierarchical Decentralisation
LATCOM: Lateral Communication
PRODINN:Product Innovation
PROCINN: Process Innovation
ORGINN: Organisational Innovation

APPENDIX G: General Linear Model (GLM) Analysis Results

Table 6:73 Univariate Analyses of Variance for Total Number of Board Members

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	41.479(b)	4	10.370	1.259	.294	.064	.376
Intercept	5051.616	1	5051.616	613.314	.000	.892	1.000
ENV1: Environmental Dynamism in Marketing Practices	3.593	1	3.593	.436	.511	.006	.100
ENV2: Environmental Customer Dynamism	25.566	1	25.566	3.104	.082	.040	.413
ENV3: Environmental Competitor's Dynamism	9.851	1	9.851	1.196	.278	.016	.190
ENV4: Environmental Complexity-Munificence	2.178	1	2.178	.264	.609	.004	.080
Error	609.508	74	8.237				
Total	5723.000	79					
Corrected Total	650.987	78					

Computed using alpha = .05, R Squared = .064 (Adjusted R Squared = .013)

Table 6:74 Univariate Analyses of Variance for Total Number of Board Members

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	22.904(b)	3	7.635	.912	.440	.035	.241
Intercept	5060.556	1	5060.556	604.286	.000	.890	1.000
ENV1: Environmental Dynamism	1.829	1	1.829	.218	.642	.003	.075
ENV2: Environmental Munificence/Hostility	14.488	1	14.488	1.730	.192	.023	.255
ENV3: Environmental Complexity	6.545	1	6.545	.782	.379	.010	.141
Error	628.083	75	8.374				
Total	5723.000	79					
Corrected Total	650.987	78					

Computed using alpha = .05, R Squared = .035 (Adjusted R Squared = -.003)

Table 6:75 Univariate Analysis of Variance for Interlocking Directors

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	14.488(b)	4	3.622	.364	.833	.024	.127
Intercept	801.541	1	801.541	80.547	.000	.577	1.000
ENV1: Environmental Dynamism in Marketing Practices	.255	1	.255	.026	.873	.000	.053
ENV2: Environmental Customer Dynamism	.877	1	.877	.088	.768	.001	.060
ENV3: Environmental Competitor's Dynamism	10.426	1	10.426	1.048	.310	.017	.172
ENV4: Environmental Complexity-Munificence	2.302	1	2.302	.231	.632	.004	.076
Error	587.121	59	9.951				
Total	1421.000	64					
Corrected Total	601.609	63					

Computed using alpha = .05, R Squared = .024 (Adjusted R Squared = -.042)

Table 6:76 Univariate Analysis of Variance for Interlocking Directors

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	7.423(b)	3	2.474	.250	.861	.012	.095
Intercept	797.517	1	797.517	80.532	.000	.573	1.000
ENV1: Environmental Dynamism	.514	1	.514	.052	.821	.001	.056
ENV2: Environmental Munificence/Hostility	1.719	1	1.719	.174	.678	.003	.069
ENV3: Environmental Complexity	5.076	1	5.076	.513	.477	.008	.109
Error	594.186	60	9.903				
Total	1421.000	64					
Corrected Total	601.609	63					

Computed using alpha = .05, R Squared = .012 (Adjusted R Squared = -.037)

Table 6:77 Univariate Analyses Of Variance for Leadership Structure

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	1.733(b)	4	.433	1.795	.139	.088	.522
Intercept	187.112	1	187.112	775.188	.000	.913	1.000
ENV1: Environmental Dynamism in Marketing Practices	1.245	1	1.245	5.157	.026	.065	.611
ENV2: Environmental Customer Dynamism	.233	1	.233	.967	.329	.013	.163
ENV3: Environmental Competitor's Dynamism	.045	1	.045	.185	.669	.002	.071
ENV4: Environmental Complexity-Munificence	.228	1	.228	.944	.334	.013	.160
Error	17.862	74	.241				
Total	208.000	79					
Corrected Total	19.595	78					

Computed using alpha = .05, R Squared = .088 (Adjusted R Squared = .039)

Table 6:78 Univariate Analyses Of Variance for Leadership Structure

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	2.028(b)	3	.676	2.887	.041	.104	.667
Intercept	187.177	1	187.177	799.148	.000	.914	1.000
ENV1: Environmental Dynamism	1.286	1	1.286	5.489	.022	.068	.638
ENV2: Environmental Munificence/Hostility	.801	1	.801	3.421	.068	.044	.447
ENV3: Environmental Complexity	.016	1	.016	.068	.795	.001	.058
Error	17.567	75	.234				
Total	208.000	79					
Corrected Total	19.595	78					

Computed using alpha = .05, R Squared = .104 (Adjusted R Squared = .068)

Table 6:79 Univariate Analyses Of Variance for Board Size

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	91.552(b)	1	91.552	12.419	.001	.111	.937
Intercept	4915.068	1	4915.068	666.734	.000	.871	1.000
Organisational Size	91.552	1	91.552	12.419	.001	.111	.937
Error	729.814	99	7.372				
Total	7414.000	101					
Corrected Total	821.366	100					

Computed using alpha = .05, R Squared = .111 (Adjusted R Squared = .102)

Table 6:80 Univariate Analyses Of Variance for Organisational Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	3.007(b)	1	3.007	3.332	.072	.042	.437
Intercept	2.416	1	2.416	2.678	.106	.034	.366
Board Size	3.007	1	3.007	3.332	.072	.042	.437
Error	68.568	76	.902				
Total	71.627	78					
Corrected Total	71.575	77					

Computed using alpha = .05, R Squared = .042 (Adjusted R Squared = .029)

Table 6:81 Univariate Analyses Of Variance for Executive Board Members

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	45.128(b)	1	45.128	20.198	.000	.183	.994
Intercept	16.576	1	16.576	7.419	.008	.076	.769
Board Size	45.128	1	45.128	20.198	.000	.183	.994
Error	201.079	90	2.234				
Total	1205.000	92					
Corrected Total	246.207	91					

Computed using alpha = .05, R Squared = .183 (Adjusted R Squared = .174)

Table 6:82 Univariate Analyses Of Variance for Non- Executive Board Members

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	210.444(b)	1	210.444	61.674	.000	.461	1.000
Intercept	16.762	1	16.762	4.912	.030	.064	.590
Board Size	210.444	1	210.444	61.674	.000	.461	1.000
Error	245.677	72	3.412				
Total	1493.000	74					
Corrected Total	456.122	73					

Computed using alpha = .05, R Squared = .461 (Adjusted R Squared = .454)

Table 6:83 Univariate Analyses Of Variance for Formation and Process in the Involvement in the Strategic Decision-Making

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	22.582(b)	7	3.226	3.916	.001	.317	.970
Intercept	.108	1	.108	.131	.719	.002	.065
Frequency of Board Meetings	15.912	2	7.956	9.658	.000	.247	.977
Duration of Board Meetings	2.530	2	1.265	1.536	.224	.049	.314
Board Size	1.410	1	1.410	1.711	.196	.028	.251
Inside/Internal Directors	.589	1	.589	.715	.401	.012	.132
ENV4: Environmental Complexity-Munificence	.137	1	.137	.166	.685	.003	.069
Error	48.605	59	.824				
Total	71.346	67					
Corrected Total	71.187	66					

Computed using alpha = .05, R Squared = .317 (Adjusted R Squared = .236)

Table 6:84 Univariate Analysis of Variance for Formation and Evaluation of the Strategic Decision-Making

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	9.837(b)	7	1.405	1.396	.224	.142	.543
Intercept	3.977	1	3.977	3.952	.051	.063	.498
Frequency of Board Meetings	1.680	2	.840	.835	.439	.028	.186
Duration of Board Meetings	4.560	2	2.280	2.265	.113	.071	.443
Board Size	2.260	1	2.260	2.246	.139	.037	.314
Inside/Internal Directors	.021	1	.021	.021	.885	.000	.052
ENV4: Environmental Complexity-Munificence	.172	1	.172	.171	.681	.003	.069
Error	59.378	59	1.006				
Total	69.396	67					
Corrected Total	69.215	66					

Computed using alpha = .05, R Squared = .142 (Adjusted R Squared = .040)

Table 6:85 Univariate Analyses Of Variance for Evaluation of the Strategic Decision-Making

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	12.598(b)	7	1.800	2.036	.065	.195	.739
Intercept	.124	1	.124	.141	.709	.002	.066
Frequency of Board Meetings	4.879	2	2.439	2.760	.071	.086	.524
Duration of Board Meetings	5.816	2	2.908	3.290	.044	.100	.603
Board Size	2.005	1	2.005	2.268	.137	.037	.316
Inside/Internal Directors	5.152	1	5.152	5.828	.019	.090	.661
ENV4:Environmental Complexity-Munificence	2.290	1	2.290	2.591	.113	.042	.353
Error	52.151	59	.884				
Total	64.907	67					
Corrected Total	64.749	66					

Computed using alpha = .05, R Squared = .195 (Adjusted R Squared = .099)

Table 6:86 Univariate Analyses Of Variance for Formation of the Strategic Decision-Making

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	25.372(b)	7	3.625	4.984	.000	.380	.993
Intercept	.788	1	.788	1.084	.302	.019	.176
Frequency of Board Meetings	20.100	2	10.050	13.818	.000	.327	.998
Duration of Board Meetings	1.757	2	.879	1.208	.306	.041	.254
Board Size	.032	1	.032	.044	.835	.001	.055
Inside/Internal Directors	.121	1	.121	.167	.685	.003	.069
ENV3:Environmental Complexity-Munificence	.996	1	.996	1.369	.247	.023	.210
Error	41.456	57	.727				
Total	66.992	65					
Corrected Total	66.828	64					

Computed using alpha = .05, R Squared = .380 (Adjusted R Squared = .303)

Table 6:87 Univariate Analysis of Variance for Evaluation of the Strategic Decision-Making

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	18.013(b)	7	2.573	3.702	.002	.313	.960
Intercept	3.194	1	3.194	4.595	.036	.075	.559
Frequency of Board Meetings	2.188	2	1.094	1.574	.216	.052	.320
Duration of Board Meetings	13.089	2	6.545	9.416	.000	.248	.973
Board Size	4.862	1	4.862	6.995	.011	.109	.739
Inside/Internal Directors	2.539	1	2.539	3.653	.061	.060	.468
ENV3:Environmental Complexity-Munificence	1.067	1	1.067	1.535	.220	.026	.230
Error	39.620	57	.695				
Total	57.638	65					
Corrected Total	57.633	64					

Computed using alpha = .05, R Squared = .313 (Adjusted R Squared = .228)

Table 6:88 Univariate Analysis of Variance for Financial Reporting in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	14.238(b)	17	.838	1.303	.233	.325	.718
Intercept	.307	1	.307	.478	.493	.010	.104
Educational Level	.003	1	.003	.004	.948	.000	.050
Educational Specialty	.205	1	.205	.318	.575	.007	.086
Functional Background	.026	1	.026	.041	.841	.001	.054
Industry Tenure of Board Members	1.424	3	.475	.738	.535	.046	.195
Company Tenure of Board Members	3.937	6	.656	1.021	.424	.117	.361
Position Tenure of Board Members	.008	1	.008	.013	.910	.000	.051
ENV1: Environmental Dynamism in Marketing Practices	4.877	1	4.877	7.586	.008	.142	.769
ENV2:Environmental Customer Dynamism	.180	1	.180	.280	.599	.006	.081
ENV3:Environmental Competitor's Dynamism	1.139	1	1.139	1.772	.190	.037	.256
ENV4:Environmental Complexity-Munificence	1.800	1	1.800	2.800	.101	.057	.374
Error	29.576	46	.643				
Total	45.352	64					
Corrected Total	43.814	63					

Computed using alpha = .05, R Squared = .325 (Adjusted R Squared = .076)

Table 6:89 Univariate Analyses Of Variance for Financial Reporting in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	13.448(b)	16	.841	1.301	.236	.307	.706
Intercept	.227	1	.227	.352	.556	.007	.089
Educational Level	1.281	3	.427	.661	.580	.040	.178
Educational Specialty	3.985	6	.664	1.028	.419	.116	.364
Functional Background	.053	1	.053	.082	.776	.002	.059
Industry Tenure of Board Members	.008	1	.008	.012	.913	.000	.051
Company Tenure of Board Members	.164	1	.164	.253	.617	.005	.078
Position Tenure of Board Members	.001	1	.001	.002	.966	.000	.050
ENV1: Environmental Dynamism	4.032	1	4.032	6.241	.016	.117	.687
ENV2: Environmental Munificence/Hostility	.409	1	.409	.633	.430	.013	.122
ENV3: Environmental Complexity	2.112	1	2.112	3.269	.077	.065	.425
Error	30.366	47	.646				
Total	45.352	64					
Corrected Total	43.814	63					

Computed using alpha = .05, R Squared = .307 (Adjusted R Squared = .071)

Table 6:90 Univariate Analyses Of Variance for Rule Formalisation in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power (a)
Corrected Model	13.348(b)	17	.785	.977	.497	.242	.572
Intercept	.005	1	.005	.007	.935	.000	.051
Educational Level	4.41E-006	1	4.41E-006	.000	.998	.000	.050
Educational Specialty	.028	1	.028	.035	.853	.001	.054
Functional Background	.561	1	.561	.698	.407	.013	.130
Industry Tenure of Board Members	2.081	3	.694	.863	.466	.047	.225
Company Tenure of Board Members	.914	6	.152	.189	.978	.021	.094
Position Tenure of Board Members	.202	1	.202	.251	.618	.005	.078
ENV1: Environmental Dynamism in Marketing Practices	2.089	1	2.089	2.598	.113	.048	.353
ENV2:Environmental Customer Dynamism	.338	1	.338	.420	.520	.008	.098
ENV3: Environmental Competitor's Dynamism	3.504	1	3.504	4.358	.042	.077	.536
ENV4: Environmental Complexity-Munificence	.033	1	.033	.041	.840	.001	.055
Error	41.808	52	.804				
Total	56.909	70					
Corrected Total	55.156	69					

Computed using alpha = .05, R Squared = .242 (Adjusted R Squared = -.006)

Table 6:91 Univariate Analyses Of Variance for Rule Formalisation in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power (a)
Corrected Model	11.501(b)	16	.719	.873	.602	.209	.500
Intercept	.007	1	.007	.009	.925	.000	.051
Educational Level	2.494	3	.831	1.009	.396	.054	.259
Educational Specialty	.570	6	.095	.115	.994	.013	.076
Functional Background	.119	1	.119	.144	.706	.003	.066
Industry Tenure of Board Members	.002	1	.002	.002	.964	.000	.050
Company Tenure of Board Members	.031	1	.031	.038	.847	.001	.054
Position Tenure of Board Members	.353	1	.353	.429	.515	.008	.099
ENV1: Environmental Dynamism	3.148	1	3.148	3.822	.056	.067	.484
ENV2: Environmental Munificence/Hostility	.500	1	.500	.607	.440	.011	.119
ENV3: Environmental Complexity	.339	1	.339	.411	.524	.008	.097
Error	43.656	53	.824				
Total	56.909	70					
Corrected Total	55.156	69					

Computed using alpha = .05, R Squared = .209 (Adjusted R Squared = -.030)

Table 6:92 Univariate Analyses Of Variance for Lower Level Hierarchical Decentralisation in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	17.705(b)	17	1.041	1.171	.318	.269	.679
Intercept	.373	1	.373	.420	.520	.008	.098
Educational Level	2.288	1	2.288	2.573	.115	.045	.351
Educational Specialty	.191	1	.191	.215	.645	.004	.074
Functional Background	3.020	1	3.020	3.396	.071	.059	.440
Industry Tenure of Board Members	1.931	3	.644	.724	.542	.039	.194
Company Tenure of Board Members	6.820	6	1.137	1.278	.283	.124	.458
Position Tenure of Board Members	.270	1	.270	.304	.584	.006	.084
ENV1: Environmental Dynamism in Marketing Practices	1.116	1	1.116	1.255	.268	.023	.196
ENV2:Environmental Customer Dynamism	.885	1	.885	.996	.323	.018	.165
ENV3:Environmental Competitor's Dynamism	.371	1	.371	.417	.521	.008	.097
ENV4:Environmental Complexity-Munificence	3.078	1	3.078	3.461	.068	.060	.447
Error	48.017	54	.889				
Total	66.694	72					
Corrected Total	65.723	71					

Computed using alpha = .05, R Squared = .269 (Adjusted R Squared = .039)

Table 6:93 Univariate Analyses Of Variance for Upper Level Hierarchical Decentralisation in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power (a)
Corrected Model	15.092(b)	17	.888	1.248	.261	.282	.715
Intercept	2.409	1	2.409	3.388	.071	.059	.440
Educational Level	.482	1	.482	.678	.414	.012	.128
Educational Specialty	.125	1	.125	.175	.677	.003	.070
Functional Background	.004	1	.004	.006	.938	.000	.051
Industry Tenure of Board Members	7.227	3	2.409	3.388	.024	.158	.735
Company Tenure of Board Members	3.725	6	.621	.873	.521	.088	.315
Position Tenure of Board Members	.224	1	.224	.315	.577	.006	.085
ENV1: Environmental Dynamism in Marketing Practices	.201	1	.201	.283	.597	.005	.082
ENV2:Environmental Customer Dynamism	1.649	1	1.649	2.320	.134	.041	.322
ENV3:Environmental Competitor's Dynamism	.283	1	.283	.399	.530	.007	.095
ENV4:Environmental Complexity-Munificence	.146	1	.146	.205	.652	.004	.073
Error	38.398	54	.711				
Total	54.613	72					
Corrected Total	53.490	71					

Computed using alpha = .05, R Squared = .282 (Adjusted R Squared = .056)

Table 6:94 Univariate Analyses Of Variance for Hierarchical Decentralisation in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	18.991(b)	16	1.187	1.555	.114	.311	.818
Intercept	2.292	1	2.292	3.003	.089	.052	.399
Educational Level	.541	1	.541	.709	.404	.013	.131
Educational Specialty	6.38E-008	1	6.38E-008	.000	1.000	.000	.050
Functional Background	1.823	1	1.823	2.388	.128	.042	.330
Industry Tenure of Board Members	6.234	3	2.078	2.722	.053	.129	.630
Company Tenure of Board Members	6.265	6	1.044	1.368	.244	.130	.490
Position Tenure of Board Members	.001	1	.001	.002	.967	.000	.050
ENV1: Environmental Dynamism	.896	1	.896	1.174	.283	.021	.187
ENV2: Environmental Munificence/Hostility	3.771	1	3.771	4.940	.030	.082	.589
ENV3: Environmental Complexity	1.287	1	1.287	1.687	.199	.030	.248
Error	41.984	55	.763				
Total	63.032	72					
Corrected Total	60.975	71					

Computed using alpha = .05, R Squared = .311 (Adjusted R Squared = .111)

Table 6:95 Univariate Analyses Of Variance for Lateral Communication in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	28.916(b)	17	1.701	2.171	.019	.440	.943
Intercept	.151	1	.151	.193	.663	.004	.071
Educational Level	1.645	1	1.645	2.099	.154	.043	.295
Educational Specialty	.002	1	.002	.002	.962	.000	.050
Functional Background	.036	1	.036	.046	.832	.001	.055
Industry Tenure of Board Members	2.096	3	.699	.892	.452	.054	.230
Company Tenure of Board Members	2.304	6	.384	.490	.812	.059	.180
Position Tenure of Board Members	.226	1	.226	.288	.594	.006	.082
ENV1: Environmental Dynamism in Marketing Practices	7.558	1	7.558	9.646	.003	.170	.860
ENV2:Environmental Customer Dynamism	.048	1	.048	.062	.805	.001	.057
ENV3:Environmental Competitor's Dynamism	1.788	1	1.788	2.282	.138	.046	.316
ENV4:Environmental Complexity-Munificence	4.410	1	4.410	5.628	.022	.107	.642
Error	36.828	47	.784				
Total	65.942	65					
Corrected Total	65.744	64					

Computed using alpha = .05, R Squared = .440 (Adjusted R Squared = .237)

Table 6:96 Univariate Analyses Of Variance for Lateral Communication in Strategic Decision-Making Process

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	29.309(b)	16	1.832	2.413	.010	.446	.962
Intercept	.046	1	.046	.061	.806	.001	.057
Educational Level	2.478	3	.826	1.088	.363	.064	.276
Educational Specialty	2.500	6	.417	.549	.768	.064	.200
Functional Background	.092	1	.092	.121	.730	.003	.063
Industry Tenure of Board Members	1.534	1	1.534	2.020	.162	.040	.286
Company Tenure of Board Members	.002	1	.002	.002	.963	.000	.050
Position Tenure of Board Members	.196	1	.196	.258	.614	.005	.079
ENV1: Environmental Dynamism	5.372	1	5.372	7.076	.011	.128	.741
ENV2: Environmental Munificence/Hostility	.033	1	.033	.044	.835	.001	.055
ENV3: Environmental Complexity	8.280	1	8.280	10.908	.002	.185	.899
Error	36.435	48	.759				
Total	65.942	65					
Corrected Total	65.744	64					

Computed using alpha = .05, R Squared = .446 (Adjusted R Squared = .261)

Table 6:97 Univariate Analyses Of Variance for Product & Process Innovation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	26.815(b)	19	1.411	2.186	.020	.522	.943
Intercept	.521	1	.521	.807	.375	.021	.141
Educational Level	2.654	3	.885	1.370	.267	.098	.334
Educational Specialty	1.454	6	.242	.375	.890	.056	.142
Outside Board Members	1.074	1	1.074	1.663	.205	.042	.242
Age of Board Members	2.679	1	2.679	4.148	.049	.098	.510
Female Board Members	.147	1	.147	.227	.636	.006	.075
Industry Tenure of Board Members	.486	1	.486	.752	.391	.019	.135
Company Tenure of Board Members	.393	1	.393	.609	.440	.016	.118
Position Tenure of Board Members	1.936	1	1.936	2.998	.091	.073	.393
ENV1: Environmental Dynamism in Marketing Practices	5.289	1	5.289	8.191	.007	.177	.796
ENV2: Environmental Customer Dynamism	.506	1	.506	.784	.382	.020	.139
ENV3: Environmental Competitor's Dynamism	5.088	1	5.088	7.879	.008	.172	.781
ENV4: Environmental Complexity-Munificence	2.625	1	2.625	4.064	.051	.097	.502
Error	24.539	38	.646				
Total	52.006	58					
Corrected Total	51.355	57					

Computed using alpha = .05, R Squared = .522 (Adjusted R Squared = .283)

Table 6:98 Univariate Analyses Of Variance for Organisational Innovation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	15.311(b)	19	.806	.748	.748	.272	.420
Intercept	.058	1	.058	.054	.818	.001	.056
Educational Level	1.177	3	.392	.364	.779	.028	.115
Educational Specialty	3.196	6	.533	.494	.808	.072	.177
Outside Board Members	.176	1	.176	.163	.689	.004	.068
Age of Board Members	.266	1	.266	.247	.622	.006	.077
Female Board Members	1.937	1	1.937	1.798	.188	.045	.257
Industry Tenure of Board Members	.039	1	.039	.036	.850	.001	.054
Company Tenure of Board Members	.264	1	.264	.245	.623	.006	.077
Position Tenure of Board Members	1.748	1	1.748	1.622	.211	.041	.237
ENV1: Environmental Dynamism in Marketing Practices	.589	1	.589	.547	.464	.014	.111
ENV2:Environmental Customer Dynamism	.120	1	.120	.112	.740	.003	.062
ENV3:Environmental Competitor's Dynamism	.093	1	.093	.086	.771	.002	.059
ENV4:Environmental Complexity-Munificence	.009	1	.009	.008	.929	.000	.051
Error	40.946	38	1.078				
Total	56.721	58					
Corrected Total	56.257	57					

Computed using alpha = .05, R Squared = .272 (Adjusted R Squared = -.092)

Table 6:99 Univariate Analyses Of Variance for Product Innovation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	15.639(b)	18	.869	1.048	.434	.326	.585
Intercept	.061	1	.061	.073	.788	.002	.058
Educational Level	1.600	3	.533	.644	.592	.047	.172
Educational Specialty	2.873	6	.479	.578	.746	.082	.204
Outside Board Members	.002	1	.002	.002	.961	.000	.050
Age of Board Members	.954	1	.954	1.152	.290	.029	.182
Female BoardMembers	.057	1	.057	.069	.794	.002	.058
Industry Tenure of Board Members	1.488	1	1.488	1.796	.188	.044	.258
Company Tenure of Board Members	.180	1	.180	.217	.644	.006	.074
Position Tenure of Board Members	2.970	1	2.970	3.584	.066	.084	.455
ENV1: Environmental Dynamism	1.525	1	1.525	1.841	.183	.045	.263
ENV2:Environmental Munificence/Hostility	.467	1	.467	.563	.457	.014	.113
ENV3:Environmental Complexity	3.571	1	3.571	4.309	.045	.099	.526
Error	32.318	39	.829				
Total	48.924	58					
Corrected Total	47.957	57					

Computed using alpha = .05, R Squared = .326 (Adjusted R Squared = .015)

Table 6:100 Univariate Analyses Of Variance for Process Innovation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	28.953(b)	18	1.608	1.678	.087	.436	.840
Intercept	5.770	1	5.770	6.020	.019	.134	.667
Educational Level	2.972	3	.991	1.034	.388	.074	.259
Educational Specialty	5.425	6	.904	.943	.476	.127	.326
Outside Board Members	.930	1	.930	.970	.331	.024	.161
Age of Board Members	5.654	1	5.654	5.899	.020	.131	.659
Female BoardMembers	.146	1	.146	.152	.699	.004	.067
Industry Tenure of Board Members	.032	1	.032	.034	.855	.001	.054
Company Tenure of Board Members	3.255	1	3.255	3.396	.073	.080	.436
Position Tenure of Board Members	.093	1	.093	.097	.757	.002	.061
ENV1: Environmental Dynamism	2.762	1	2.762	2.881	.098	.069	.381
ENV2:Environmental Munificence/Hostility	2.133	1	2.133	2.225	.144	.054	.307
ENV3:Environmental Complexity	3.754	1	3.754	3.916	.055	.091	.488
Error	37.381	39	.958				
Total	66.343	58					
Corrected Total							

Computed using alpha = .05, R Squared = .436 (Adjusted R Squared = .176)

Table 6:101 Univariate Analyses Of Variance for Organisational Innovation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	15.535(b)	18	.863	.821	.666	.275	.457
Intercept	.174	1	.174	.166	.686	.004	.068
Educational Level	2.025	3	.675	.642	.593	.047	.172
Educational Specialty	3.509	6	.585	.556	.762	.079	.197
Outside Board Members	.279	1	.279	.265	.610	.007	.079
Age of Board Members	1.177	1	1.177	1.119	.297	.028	.178
Female BoardMembers	1.420	1	1.420	1.351	.252	.033	.205
Industry Tenure of Board Members	.022	1	.022	.021	.887	.001	.052
Company Tenure of Board Members	.027	1	.027	.026	.872	.001	.053
Position Tenure of Board Members	1.491	1	1.491	1.418	.241	.035	.213
ENV1: Environmental Dynamism	.172	1	.172	.164	.688	.004	.068
ENV2:Environmental Munificence/Hostility	.154	1	.154	.147	.704	.004	.066
ENV3:Environmental Complexity	.092	1	.092	.087	.769	.002	.060
Error	41.014	39	1.052				
Total	57.102	58					
Corrected Total	56.550	57					

Computed using alpha = .05, R Squared = .275 (Adjusted R Squared = -.060)

Table 6:102 Univariate Analyses Of Variance for Organisational Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	9.540(b)	10	.954	1.108	.383	.235	.478
Intercept	.242	1	.242	.282	.599	.008	.081
INVSDM1:Formation and Process of SDM	.838	1	.838	.974	.330	.026	.161
INVSDM2:Formation and Evaluation of SDM	.006	1	.006	.007	.935	.000	.051
INVSDM3: Evaluation of SDM	.001	1	.001	.001	.979	.000	.050
Financial Reporting	4.255	1	4.255	4.942	.033	.121	.581
Rule Formalisation	.002	1	.002	.002	.965	.000	.050
Hierarchical Decentralisation(Lower Level)	.291	1	.291	.338	.564	.009	.087
Hierarchical Decentralisation(Upper Level)	.134	1	.134	.155	.696	.004	.067
Lateral Communication	.002	1	.002	.002	.966	.000	.050
Product and Process Innovation	.022	1	.022	.025	.875	.001	.053
Organisational Innovation	.026	1	.026	.030	.864	.001	.053
Error	30.989	36	.861				
Total	40.727	47					
Corrected Total	40.530	46					

Computed using alpha = .05, R Squared = .235 (Adjusted R Squared = .023)

Table 6:103 Univariate Analyses Of Variance for Organisational Performance

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power(a)
Corrected Model	9.957(b)	9	1.106	1.295	.274	.250	.528
Intercept	.269	1	.269	.314	.579	.009	.085
SD1:Formation of SDM	.831	1	.831	.973	.331	.027	.160
SD2: Evaluation of SDM	1.587	1	1.587	1.858	.182	.050	.264
Financial Reporting	5.732	1	5.732	6.710	.014	.161	.712
Rule Formalisation	.110	1	.110	.128	.722	.004	.064
Hierarchical Decentralisation	.038	1	.038	.044	.835	.001	.055
Lateral Communication	.001	1	.001	.001	.980	.000	.050
Product Innovation	.001	1	.001	.001	.980	.000	.050
Process Innovation	.171	1	.171	.201	.657	.006	.072
Organisational Innovation	.036	1	.036	.043	.838	.001	.055
Error	29.899	35	.854				
Total	39.926	45					
Corrected Total	39.856	44					

Computed using alpha = .05, R Squared = .250 (Adjusted R Squared = .057)

APPENDIX H: Summary of Hypotheses Testing

Table HA-1 Regression Analysis Results (factors with eigenvalue greater than one)	Hypotheses	t-value	p	Statement
H1a	Complex Environment –board size	.514	.609	Not supported
	Complex Environment-interlocking directors	-.481	.632	Not supported
H1b	Unstable environment-board size	.660	.511	Not supported
		-1.762	.082	
		-1.094	.278	
H1c	Munificent environment-board size	.514	.609	Not supported
H1d	Munificent environment-board size	.514	.609	Not supported
	Munificent environment-Interlocking directors	-.481	.632	Not supported
H1e	Dynamic environment- leadership structure	2.271	.026	Significant
		-.983	.329	Not supported
		.430	.669	Not supported
H2a	Firm’s size-board size	3.524	.001	Significant
H2b	Board size-organisational performance	1.825	.072	Not Significant
H2c:	Board size-executive BODs	4.494	.000	Significant
H2d	Board size-Non-executive BODs	7.853	.000	Significant
H3a	Board size- SDM involvement	-1.218	.228	Not Significant
		.196	1.420	Not supported
		1.148	.256	Not supported
H3b	Inside directors- SDM involvement	1.280	.206	Not supported
		.092	.927	Not Significant
		-1.832	.072	Not supported
H3c	Frequency of BODmeetings- SDM involvement	-2.031	.009	Significant (INVSDM1)
		-2.031	.047	Significant(INVSDM1)
		-.899	.373	Not supported

		-0.597	.553	Not supported
		-1.175	.245	Not supported
		-1.717	.092	Not supported
		.224	.824	Not supported
		.043	.966	Not supported
		-.813	.420	Not supported
		1.371	.176	Not supported
		-2.126	.038	Significant(negative)(INVSDM 3)
		-1.545	.128	
		-1.202	.234	Not supported
		-1.040	.303	Not supported
		-1.358	.180	Not supported
H3d	Duration of BOD meetings- SDM involvement	1.685	.098	Not supported
		1.703	.094	Not supported
		1.262	.212	Not supported
		1.184	.241	Not supported
		1.364	.178	Not supported
		2.749	.008	Significant (INVSDM2)
		2.848	.006	Significant (INVSDM2)
		2.641	.011	Significant (INVSDM2)
		3.238	.002	Significant (INVSDM2)
		2.033	.047	Not supported
		.636	.527	Not supported
		.718	.476	Not supported
		1.161	.251	Not supported
		1.430	.158	Not supported
		1.065	.292	Not supported
H3e	Uncertain environment- SDM involvement	.711	.480	Not Significant
		-.806	.424	Not supported
		-.789	.434	Not Significant
H4a	Education level- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.319	.751	Not supported
		.588	.559	Not supported
		.059	.953	Not supported
		.404	.688	Not supported
		-.008	.994	Not supported
		-.032	.974	Not supported
		-.914	.365	Not supported
		-1.222	.227	Not supported
		-1.006	.319	Not supported

		-.305	.761	Not supported
		-.749	.457	Not supported
		-1.344	.184	Not supported
		.166	.869	Not supported
		-.345	.732	Not supported
		-.226	.822	Not supported
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	-.176	.861	Not supported
		-.348	.729	Not supported
		-.450	.655	Not supported
		-.254	.800	Not supported
		.450	.655	Not supported
		-1.290	.203	Not supported
		-.439	.662	Not supported
		.048	.962	Not supported
		-.107	.916	Not supported
		-.142	.887	Not supported
		.141	.888	Not supported
		-.415	.680	Not supported
		1.515	.136	Not supported
		2.229	.030	Significant(L.H.sciences)
		1.886	.065	Not supported
		1.946	.057	Not supported
		2.440	.018	Not supported
		1.870	.067	Not supported
		.499	.620	Not supported
		.895	.375	Not supported
		-.334	.740	Not supported
		-.345	.732	Not supported
		-.081	.936	Not supported
		.392	.697	Not supported
		1.000	.322	Not supported
		1.434	.158	Not supported
		.791	.433	Not supported
		1.030	.308	Not supported
		1.215	.231	Not supported
		1.167	.249	Not supported
H4c	Functional background- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.114	.910	Not Significant
		.501	.618	Not Significant
		-.551	.584	Not Significant
		.561.	.577	Not Significant

		536	.594	Not Significant
H4d	Industry,company, position tenure- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	-.066 .564 .201 .002 -.186 .835 1.604 .464 -1.843 -.823 -.419 -.078 1.449 -.048 -.214	.948 .575 .841 .998 .853 .407 .115 .645 .071 .414 .677 .938 .154 .962 .832	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.754 .529 1.331 1.673 1.612 -.648 2.088 .203 1.120 .998 .646 1.860 .532 1.523 -.631 .453 3.106 -.248 1.511 2.372	.008 .599 .190 .101 .113 .520 .042 .840 .268 .323 .521 .068 .597 .134 .530 .652 .003 .805 .138 .022	Significant(ENV1,F.R.) Not Significant Not Significant Not Significant Not Significant Not Significant Significant(ENV3,R.F) Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Significant(ENV1,LC) Not Significant Not Significant Significant (ENV4,LC)
H5a	Outside directors-innovation	1.290 -.404	.205 .689	Not Significant Not Significant

H5b	Age- innovation	-2.037 .497	.049 .622	Significant (Product &Process Innovation and Age)
H5c	Gender-innovation	.477 -1.341	.636 .188	Not Significant Not Significant
H5d	Industry,company, position tenure-innovation	.867 .780 1.732 .190 .495 -1.274	.391 .440 .091 .850 .623 .211	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H5e	Education- innovation	.186 .533 .884 -.088 -.347 -.399	.854 .597 .382 .930 .731 .692	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H5f	Education Specilaty- innovation	.276 .107 .122 .572 .538 .326 -.653 .376 -.326 -.531 -.667 -.030	.784 .915 .903 .571 .593 .747 .518 .709 .746 .598 .509 .976	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H5g	Environment-innovation	2.862 -.885 2.807 2.016 .740 .334 -.293 -.089	.007 .382 .008 .051 .464 .740 .771 .929	Significant(InnENV1,2,3) Not Significant Significant(InnENV1,2,3) Significant(InnENV1,2,3) Not Significant Not Significant Not Significant Not Significant
H6	BOD involvement , SDM and innovation- organisational performance	-.987 .082 -.027 2.223	.330 .935 .979 .033	Not Significant Not Significant Not Significant Significant

		.044	.965	(FINREPORT,ORGPREF)
		.582	.564	Not Significant
		-.394	.696	Not Significant
		-.043	.966	Not Significant
		.158	.875	Not Significant
		.173	.864	Not Significant

Table HA-2 Regression Analysis Results (forced factors)	Hypotheses	t-value	p	Statement
H1a	Complex Environment –board size	.884	.379	Not Significant
	Environment-interlocking directors	-.716	.477	Not Significant
H1b	Unstable environment-board size	-.467	.642	Not Significant
H1c	Munificent environment-board size	-1.315	.192	Not Significant
H1d	Munificent environment-board size	-1.315	.192	Not Significant
	Munificent environment-Interlocking directors	.417	.678	Not Significant
H1e	Dynamic environment- leadership structure	2.343	.022	Significant (ENV1)
		-1.850	.068	Not Significant
		.260	.795	Not Significant
H2a	Firm’s size-board size	3.524	.001	Significant
H2b	Board size-organisational performance	1.825	.072	Not Significant
H2c:	Board size-executive BODs	4.494	.000	Significant
H2d	Board size-Non-executive BODs	7.853	.000	Significant
H3a	Board size- SDM involvement	-1.218	.228	Not Significant
		1.420	.161	Not Significant
H3b	Inside directors- SDM involvement	1.280	.206	Not Significant
		.092	.927	Not Significant
H3c	Frequency of BODmeetings- SDM involvement	-2.031	.009	Significant (INVSDM1)
		-2.031	.047	Significant (INVSDM3)
		-.899	.373	Not Significant
		-.597	.553	Not Significant
		-1.175	.245	Not Significant
		-1.717	.092	Not Significant
		.224	.824	Not Significant
		.043	.966	Not Significant
		-.813	.420	Not Significant
1.371	.176	Not Significant		
H3d	Duration of BOD meetings- SDM involvement	1.685	.098	Not Significant
		1.703	.094	Not Significant

		1.262	.212	Not Significant
		1.184	.241	Not Significant
		1.364	.178	Not Significant
		2.749	.008	Significant (INVSDM2)
		2.848	.006	Significant (INVSDM2)
		2.641	.011	Significant (INVSDM2)
		3.238	.002	Significant (INVSDM2)
		2.033	.047	Significant (INVSDM2)
H3e	Uncertain environment- SDM involvement	.711	.480	Not Significant
		-.806	.426	Not Significant
H4a	Education level- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.410	.684	Not Significant
		.601	.551	Not Significant
		.102	.919	Not Significant
		.469	.641	Not Significant
		-.017	.986	Not Significant
		.084	.934	Not Significant
		-.937	.353	Not Significant
		-.148	.143	Not Significant
		-1.700	.095	Not Significant
		.175	.862	Not Significant
		-.398	.693	Not Significant
		-.199	.843	Not Significant
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	-.182	.856	Not Significant
		-.464	.645	Not Significant
		-.545	.588	Not Significant
		-.351	.727	Not Significant
		.373	.710	Not Significant
		-1.333	.189	Not Significant
		-.237	.814	Not Significant
		.069	.945	Not Significant
		-.056	.955	Not Significant
		-.132	.896	Not Significant
		.150	.881	Not Significant
		-.317	.752	Not Significant
		1.513	.136	Not Significant
		2.335	.023	Significant(science)
		1.272	.209	Not Significant
		1.314	.194	Not Significant
		1.877	.066	Not Significant
		1.711	.093	Not Significant

		1.210	.232	Not Significant
		1.490	.143	Not Significant
		.964	.340	Not Significant
		1.115	.271	Not Significant
		1.369	.177	Not Significant
		1.352	.183	Not Significant
H4c	Functional background- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.287	.776	Not Significant
		.380	.706	Not Significant
		.042	.967	Not Significant
		.348	.730	Not Significant
H4d	Industry,company, position tenure- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	-.109	.913	Not Significant
		.503	.617	Not Significant
		.043	.966	Not Significant
		-.045	.964	Not Significant
		-.194	.847	Not Significant
		.655	.515	Not Significant
		.842	.404	Not Significant
		.000	1.000	Not Significant
		-1.545	.128	Not Significant
		1.421	.162	Not Significant
		.047	.963	Not Significant
		-.508	.614	Not Significant
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	2.498	.016	Significant(ENV1,F,R)
		.795	.430	Not Significant
		1.808	.077	Not Significant
		1.955	.056	Not Significant
		-.779	.440	Not Significant
		.641	.524	Not Significant
		1.083	.283	Not Significant
		2.223	.030	Significant (ENV1,H)
		1.299	.199	Not Significant
		2.660	.011	Significant (ENV1,LC)
		-.210	.835	Not Significant
		3.303	.002	Significant (ENV3,LC)
H5a	Outside directors-innovation	-.049	.961	Not Significant
		.985	.331	Not Significant
		-.515	.610	Not Significant
H5b	Age- innovation	-1.073	.290	Not Significant
		-2.429	.020	Significant (Process Inn. Age)
		1.058	.297	Not Significant

H5c	Gender-innovation	-.262	.794	Not Significant
		-.390	.699	Not Significant
		-1.162	.252	Not Significant
H5d	Industry,company, position tenure-innovation	1.340	.188	Not Significant
		-.466	.644	Not Significant
		1.893	.066	Not Significant
		.183	.855	Not Significant
		1.843	.073	Not Significant
		-.311	.757	Not Significant
		.144	.887	Not Significant
		.162	.872	Not Significant
-1.191	.241	Not Significant		
H5e	Education- innovation	.431	.669	Not Significant
		.671	.506	Not Significant
		.854	.398	Not Significant
		-.414	.681	Not Significant
		-.200	.842	Not Significant
		.220	.827	Not Significant
		.013	.990	Not Significant
		-.290	.773	Not Significant
-.446	.658	Not Significant		
H5f	Education Specilaty- innovation	.916	.366	Not Significant
		.101	.920	Not Significant
		.976	.335	Not Significant
		.744	.461	Not Significant
		1.180	.245	Not Significant
		.796	.431	Not Significant
		-.212	.833	Not Significant
		.185	.854	Not Significant
		-.714	.479	Not Significant
		.038	.970	Not Significant
		-.326	.746	Not Significant
		-.264	.793	Not Significant
		-.664	.510	Not Significant
		.317	.753	Not Significant
		-.171	.865	Not Significant
-.542	.591	Not Significant		
-.615	.542	Not Significant		
.013	.989	Not Significant		

Table HA-3 GLM Analysis Results (factors with eigenvalue greater than one)	Hypotheses	p	Statement
H1a	Complex Environment –board size	.609	Not Significant
	Complex Environment-interlocking directors	.632	Not Significant
H1b	Unstable environment-board size	.511	Not Significant
		.082	Not Significant
		.278	Not Significant
H1c	Munificent environment-board size	.609	Not Significant
H1d	Munificent environment-board size	.609	Not Significant
	Munificent environment-Interlocking directors	.632	Not Significant
H1e	Dynamic environment- leadership structure	.026	Significant
		.329	Not Significant
		.669	Not Significant
H2a	Firm’s size-board size	.001	Significant
H2b	Board size-organisational performance	.072	Not Significant
H2c:	Board size-executive BODs	.000	Significant
H2d	Board size-Non-executive BODs	.000	Significant
H3a	Board size- SDM involvement	.196	Not Significant
		.139	Not Significant
		.137	Not Significant
H3b	Inside directors- SDM involvement	.401	Not Significant
		.885	Not Significant
		.019	Significant (INVSDM3)
H3c	Frequency of BODmeetings- SDM involvement	.000	Significant (INVSDM1)
		.439	Not Significant
		.071	Not Significant
H3d	Duration of BOD meetings- SDM involvement	.224	Significant (INVSDM2)
		.113	Not Significant

		.044	Significant (INVSDM3)
H3e	Uncertain environment- SDM involvement	.685 .681 .113	Not Significant Not Significant Not Significant
H4a	Education level- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.948 .998 .115 .414 .154	Not Significant Not Significant Not Significant Not Significant Not Significant
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.575 .853 .645 .677 .962	Not Significant Not Significant Not Significant Not Significant Not Significant
H4c	Functional background- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.841 .407 .071 .938 .832	Not Significant Not Significant Not Significant Not Significant Not Significant
H4d	Industry,company, position tenure- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.535 .424 .910 .466 .978 .618 .542 .283 .584 .024 .521 .577	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Significant (upper level hier.dec) Not Significant Not Significant
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.008 .599 .190 .101 .113 .520 .042 .840 .268	Significant(ENV1,FINREPORT) Not Significant Not Significant Not Significant Not Significant Not Significant Significant(ENV3,RULEFORM) Not Significant Not Significant

		.323 .521 .068 .597 .134 .530 .652 .003 .805 .138 .022	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Significant (ENV1,LATCOMM) Not Significant Not Significant Significant (ENV4,LATCOMM)
H5a	Outside directors-innovation	.205 .689	Not Significant Not Significant
H5b	Age- innovation	.049 .622	Significant (Product &Process) Not Significant
H5c	Gender-innovation	.636 .188	Not Significant Not Significant
H5d	Industry,company, position tenure-innovation	.391 .440 .091 .850 .623 .211	Not Significant Not Significant Not Significant Not Significant Not Significant
H5e	Education- innovation	.267 .779	Not Significant Not Significant
H5f	Education Specilaty- innovation	.890 .808	Not Significant Not Significant
H5g	Environment-innovation	.007 .382 .008 .051 .464 .740 .771 .929	Significant (Prod&Proc.,ENV1) Not Significant Significant(Prod.Prc., ENV4) Not Significant Not Significant Not Significant Not Significant
H6	BOD involvement , SDM and innovation-organisational performance	.330 .935 .979 .033	Not Significant Not Significant Not Significant Significant (FINREPORT)

		.965	Not Significant
		.564	Not Significant
		.696	Not Significant
		.966	Not Significant
		.875	Not Significant
		.864	Not Significant

Table 6:5 GLM Analysis Results (forced factors)	Hypotheses	p	Statement
H1a	Complex Environment –board size	.379	Not Significant
	Complex Environment-interlocking directors	.477	Not Significant
H1b	Unstable environment-board size	.642	Not Significant
H1c	Munificent environment-board size	.192	Not Significant
H1d	Munificent environment-board size	.192	Not Significant
	Munificent environment-Interlocking directors	.678	Not Significant
H1e	Dynamic environment- leadership structure	.022	Significant
		.068	Not Significant
		.795	Not Significant
H2a	Firm’s size-board size	.001	Significant
H2b	Board size-organisational performance	.072	Not Significant
H2c:	Board size-executive BODs	.000	Significant
H2d	Board size-Non-executive BODs	.000	Significant
H3a	Board size- SDM involvement	.137	Not Significant
		.835	Not Significant
H3b	Inside directors- SDM involvement	.019	Not Significant
		.685	Not Significant
H3c	Frequency of BODmeetings- SDM involvement	.000	Significant (INVSDM1)
		.216	Significant(negative) (INVSDM3)
H3d	Duration of BOD meetings- SDM involvement	.306	Not Significant
		.000	Significant (INVSDM2)
H3e	Uncertain environment- SDM involvement	.247	Not Significant
		.220	Not Significant
H4a	Education level- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.580	Not Significant
		.396	Not Significant

		.404 .363	Not Significant Not Significant
H4b	Education specialty- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.419 .994 1.000 .768	Not Significant Not Significant Not Significant Not Significant
H4c	Functional background- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.776 .706 .128 .730	Not Significant Not Significant Not Significant Not Significant
H4d	Industry,company, position tenure- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.913 .617 .966 .964 .847 .515 .053 .244 .967 .162 .963 .614	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H4e	Environment- financial reporting, rule formalisation, hierarchical decentralisation and lateral communication SDM	.016 .430 .077 .056 .440 .524 .283 .030 .199 .011 .835 .002	Significant(ENV1,FINREPORT) Not Significant Not Significant Not Significant Not Significant Not Significant Significant(ENV3,RULEFORM) Not Significant Significant (ENV1,LATCOMM) Not Significant Significant (ENV3,LATCOMM)
H5a	Outside directors-innovation	.961 .331 .610	Not Significant Not Significant Not Significant
H5b	Age- innovation	.290	Not Significant

		.020 .297	Significant (Pr&PC,and Age) Not Significant
H5c	Gender-innovation	.794 .699 .252	Not Significant Not Significant Not Significant
H5d	Industry,company, position tenure-innovation	.188 .644 .066 .855 .073 .757 .887 .872 .241	Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant Not Significant
H5e	Education- innovation	.592 .388 .593	Not Significant Not Significant Not Significant
H5f	Education Specilaty- innovation	.746 .476 .762	Not Significant Not Significant Not Significant
H5g	Environment-innovation	.183 .457 .045 .098 .144 .055 .688 .704 .769	Not Significant Not Significant Significant (Prod.Proc.Inn.,ENV1) Not Significant Not Significant Not Significant Not Significant Not Significant
H6	BOD involvement , SDM and innovation-organisational performance	.331 .182 .014 .722 .835 .980 .980	Not Significant Not Significant Significant (FINREPORT) Not Significant Not Significant Not Significant Not Significant

		.657 .838	Not Significant
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