

STRATEGIC DECISION-MAKING PROCESSES: THE ROLE OF MANAGEMENT AND CONTEXT

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This paper investigates the relationship between the process of strategic decision-making and management and contextual factors. First, drawing on a sample of strategic decisions, it analyzes the process through which they are taken, into seven dimensions: comprehensiveness/rationality, financial reporting, rule formalization, hierarchical decentralization, lateral communication, politicization, problem-solving dimension. Second, these process dimensions are related to (1) decision-specific characteristics, both perceived characteristics and objective typologies of strategic decisions, (2) top management characteristics, and (3) contextual factors referring to external corporate environment and internal firm characteristics. Overall, the results support the view that strategic decision processes are shaped by a multiplicity of factors, in all these categories. But the most striking finding is that decision-specific characteristics appear to have the most important influence on the strategic decision-making process, as decisions with different decision-specific characteristics are handled through different processes. The evident dominance of decision-specific characteristics over management and contextual factors enriches the traditional 'external control' vs. 'strategic choice' debate in the area of strategic management. An interpretation of results is attempted and policy implications are derived. © 1998 John Wiley & Sons, Ltd.

Strat. Mgmt. J., Vol. 19, 115-147 (1998)

INTRODUCTION

Strategic decision-making has emerged as one of the most active areas of current management research. The area has greatly benefited from such research traditions as behavioral decision theory and transaction cost economics and has recently gained its own momentum (Schwenk, 1995). However, despite a substantial body of literature, it is still widely recognized that our knowledge of *strategic decision-making processes* is limited and is mostly based on normative or descriptive studies and on assumptions most of which remain untested (e.g., Bateman and Zeit-

haml, 1989; Langley, 1990; Pettigrew, 1990; Rajagopalan, Rasheed, and Datta, 1993; Rajagopalan *et al.*, 1997; Schneider and De Meyer, 1991). As Eisenhardt and Zbaracki put it, despite the crucial role of strategic decisions, the strategy process research has not departed significantly from a stage of being based on 'mature paradigms and incomplete assumptions' (Eisenhardt and Zbaracki, 1992: 17).

In particular, the need has been recognized for integrative research which explicitly considers the impact of context on strategic processes (Bateman and Zeithaml, 1989; Bryson and Bromiley, 1993; Rajagopalan *et al.*, 1993, 1997; Schneider and De Meyer, 1991; Schwenk, 1995). For instance, Pettigrew (1990) asked whether the nature of the decision problem shapes the process more than does the organizational context through which the process proceeds. In the same vein, Rajagopalan

Key words: strategic decision-making; rationality; politics; strategic decisions; top management

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et al. (1997) suggest as one of the priorities of future research in strategic decision-making the examination of the extent to which variations in strategic decision-making processes (DMPs) are explained by variations in organizational, environmental, decision-specific, and managerial factors.

The wider literature on environmental determinism and the role of management choice is relevant here. Strategic decisions (SDs) are among the main means through which management choice is actually effected. But empirical research has not been extended to rigorous investigation of the role of management factors, contextual factors, and decision-specific characteristics on the actual strategic decision-making processes.

The present paper attempts to contribute to this area drawing upon an in-depth empirical investigation of a number of strategic decisions. Specifically, it focuses on SDs of an investment nature. These are decisions leading to significant commitment of resources, with significant impact on the firm as a whole and on its long-term performance (Marsh *et al.*, 1988).

First, the paper analyzes the process through which organizations arrive at an SD. Using prior research and empirical evidence it identifies and measures significant generic dimensions of the process. The dimensions extracted refer to comprehensiveness/rationality, formalization, configuration of the process, and politicization. Second, these dimensions are related to a number of factors belonging to the following categories: decision-specific characteristics, top management characteristics, contextual factors, i.e., external corporate environment, and internal firm characteristics (such as systems, performance, size, ownership).

The structure of the paper is as follows. First, we review the theoretical background and propose an integrated research framework for studying the effect of management and context on SD processes. Then comes our research methodology, the consideration of the dimensions of the process of arriving at SDs and the explanation of the selection and operationalization of management and other contextual variables. Next, we present the analysis of the data as well as the main results of the study. Finally, we discuss our results, summarize the main conclusions and derive theory and policy implications.

Dimensions of SD processes

Various dimensions/aspects of SD-making processes have been emphasized in the literature. Many studies in the field of SD-making describe the process as a sequence of steps, phases or routes (e.g., Fredrickson, 1984; Mintzberg, Raisinighani, and Theoret 1976). Others focus on process dimensions instead (e.g., Bourgeois and Eisenhardt, 1988; Hickson *et al.*, 1986; Lyles, 1987; Miller, 1987; Stein, 1980). Several dimensions of SD processes can be derived from the literature. These include the following:

- *Comprehensiveness/rationality* dimension (Dean and Sharfman, 1993a, 1993b; Lyles and Mitroff, 1980; Miller, 1987). Elements of rationality can also be traced in studies addressing such dimensions as complexity of methodology (Langley, 1990), degree of inquiry (Lyles, 1987), and scrutiny (Cray *et al.*, 1988).
- *Centralization* (Cray *et al.*, 1988; Lyles, 1987; Miller, 1987).
- *Formalization/standardization* of the process (e.g., Stein, 1980).
- *Political/problem-solving dissension dimension*. This includes among others politicality (Lyles, 1987; Hickson *et al.*, 1986; Dean and Sharfman, 1993b; Pfeffer and Salancik, 1974), and negotiation/bargaining (Cray *et al.*, 1988; Hickson *et al.*, 1986; Pettigrew, 1973).
- Other factors have also been suggested such as dynamic factors (Cray *et al.*, 1988; Mintzberg *et al.*, 1976), forcing (Bryson and Bromiley, 1993), and duration (Hickson *et al.*, 1986; Wally and Baum, 1994).

Characterization of the DMP on these dimensions allows the researcher to examine possible interrelationships with contextual and other factors.

The role of broader context in strategic decision-making

Many researchers have referred to aspects of contextual influence on strategic DMPs (e.g., Beach and Mitchell, 1978; Billings, Milburn, and Schaalman, 1980; Bryson and Bromiley, 1993; Dutton, Fahey, and Narayanan, 1983; Hitt and Tyler, 1991; Rajagopalan *et al.*, 1993). Schneider and De Meyer (1991), in an attempt to provide

an integrative model, proposed the following categorization of factors which are expected to influence strategic processes: (1) *managers' individual characteristics* and group dynamics; (2) *internal organizational context*; and (3) *environmental factors*. Pettigrew (1990) suggests that in addition to context, research should consider the role and significance of *the nature of the decision problem* in shaping the process.

An integration of these contextual domains into a wider framework looks a promising avenue for research. Such a framework must combine at least the following basic perspectives: an 'individual decision perspective', 'strategic or management choice', 'environmental determinism', and a 'firm characteristics and resource availability perspective'. The following paragraphs briefly discuss the theoretical underpinnings of each perspective, as well as the most important relevant research efforts under each perspective.

The decision perspective

The nature of the decision itself, or the SD project, may be important. Research into decision-making cognition and labeling suggests that the same internal or external stimulus may be interpreted quite differently by managers in different organizations or even within the same organization (e.g., Dean and Sharfman, 1993a; Dutton, 1993; Haley and Stumph, 1989). It has been argued that the way managers categorize and label a decision in the early stages of the DMP strongly influences the organization's subsequent responses (Dutton, 1993; Fredrickson, 1985; Mintzberg *et al.*, 1976). For example, there is evidence that if a decision is perceived as a crisis different actions will be taken than if the decision is perceived as an opportunity (Jackson and Dutton, 1988; Milburn, Schuler, and Watman, 1983). Fredrickson (1985) found that when decisions were interpreted as threats as opposed to opportunities, the DMP followed was characterized by greater comprehensiveness.

Our understanding, however, of the impact of decision-specific characteristics on organizational decision-making processes is still quite limited (Papadakis and Lioukas, 1996; Rajagopalan *et al.*, 1993). Most of the empirical work focuses on: (1) single decision-specific characteristics (e.g., opportunity or crisis) and their influence on aspects of the DMP; or (2) the early stages of

issue identification and diagnosis (e.g., Billings *et al.*, 1980; Dutton, 1986; Jackson and Dutton, 1988). The authors are not aware of any empirical work that empirically examines a range of decision-specific characteristics in relationship to a range of process dimensions. With few exceptions (e.g., Dean and Sharfman, 1993a; Dutton, 1986; Dutton, Walton, and Abrahamson, 1989; Dutton *et al.*, 1983; Fredrickson, 1985), existing research has not yet shown in any detail how decision-specific characteristics shape the DMP *as a whole*.

The strategic or management choice perspective

This perspective emphasizes the role of decision-makers. It stresses that strategic choices have an endogenous behavioral component, and partly reflect the idiosyncrasies of decision-makers (Child, 1972; Cyert and March, 1963). A number of studies extend this argument further, contending that the role of 'upper echelons' or 'top managers' or 'strategic leadership' is important enough to determine strategy content and process (Child, 1972; Hambrick and Mason, 1984; Miller and Toulouse, 1986).

Research has mainly focused on the influence of top management (i.e., CEO and/or top management team) on corporate strategies (Miller and Toulouse, 1986; Finkelstein and Hambrick, 1990), on performance (Haleblian and Finkelstein, 1993; Smith *et al.*, 1994) and on planning formality (Bantel, 1993). There has been little empirical work on the link between top management and the process of making SDs (Bantel, 1993; Huff and Reger, 1987; Lewin and Stephens, 1994; Smith *et al.*, 1994). As Rajagopalan *et al.* (1993: 364) stress in a recent review:

research relating organizational factors such as ... top management team (TMT) characteristics to strategic decision processes is limited.

Moreover, the few studies which have been done on the links between top management characteristics and strategic DMPs have produced mixed results. Recently Hiitt and Tyler (1991) found that the demographic characteristics of CEOs (i.e., type of academic education) influenced the modes of strategic decision-making followed. It is interesting to note that counter-arguments have also been advanced. Stein, in studying the strategic DMP, went so far as to

conclude that 'leadership does not constitute a meaningful contextual domain influencing strategic procedures' (Stein, 1980: 332). The same view has also been supported by Lieberman and O'Connor (1972), and Hannan and Freeman (1977). From another perspective, Lyles and Mitroff (1980: 117), note that management characteristics may not influence the organizational problem-formulation process.

This is a significant issue that needs to be resolved empirically. The influence of top management on SDs remains unclear. To advance our knowledge of the role of the CEO and the TMT we need a better understanding of their impact (if any) on strategic DMPs and/or the underlying characteristics which are important (Rajagopalan *et al.*, 1997; Smith *et al.*, 1994).

The environmental determinism perspective

According to *environmental determinism*, strategic decisions and processes are expressing adaptation to opportunities, threats, constraints, and other characteristics of the environment. The role of top managers is minimized to a facilitation of this adaptation. Hannan and Freeman (1977) and Aldrich (1979) go even further to propose a process of natural selection of species for organizations: the environment determines who will survive, while top managers are passive agents with minimal impact on corporate development. This view is in line with economic theories in which decision outputs rather than internal DMPs are relevant for the explanation of a firm's behavior in a competitive environment.

In the context of SDs the environmental determinism perspective mainly addresses the question of how environmental factors (e.g., dynamism, hostility) influence strategic DMPs. Few empirical studies can be found here (e.g., Fredrickson, 1984; Eisenhardt, 1989; Judge and Miller, 1991) and those available seem to have produced contradictory results (Rajagopalan *et al.*, 1997). For example, Fredrickson and Jaquinto (1989) contend that companies operating in stable environments follow rational-comprehensive strategic DMPs. In the same vein, Stein (1980) argues that companies operating in highly dynamic environments may tend to employ both less extensive search and less explicit analysis of alternatives. Yet, Bourgeois and Eisenhardt (1988) concluded that in high-velocity environ-

ments effective firms follow more rational DMPs. Sharfman and Dean (1991) argued for a link between environmental heterogeneity and standardization in the making of SDs. In a similar vein, Priem, Rasheed, and Kotulic (1995) have found that comprehensive processes led to better performance in rapidly changing environments.

In sum, the results of this body do not help us in making any meaningful generalizations (Sharfman and Dean, 1991). Rajagopalan *et al.* (1993: 354) and Dess and Rasheed (1991) note that the small number of studies adds to the uncertainty as to the effects of each environmental aspect on the process of making SDs. Another criticism is that most research seems to focus mainly on one important environmental characteristic (i.e., environmental uncertainty). Other important characteristics such as environmental munificence-hostility seem to have received somewhat less attention (Rajagopalan *et al.*, 1993).

The firm characteristics and resource availability perspective

This perspective emphasizes internal factors such as: internal systems, company performance, size, corporate control (i.e., ownership). At the level of theory, it can be linked to the '*inertial*' perspective proposed by Romanelli and Tushman (1986), according to which existing organizational arrangements, structures, systems, processes, and resources, though initially determined by management and environmental forces, in turn constrain future strategic decision-making. It is also related to *resource availability* such as profitability and slack resources. More specifically:

Internal systems. The systems of an organization (especially formal planning systems (FPSs)), might be expected not only to exert significant influence on the flow of information between the layers of hierarchy, but also to determine the nature and context of human interactions, and to influence SD processes (Armstrong, 1982; Miller, 1987). The literature is replete with studies arguing that FPSs are essential tools for managers, since they are designed to improve managerial decision-making (e.g., Duncan, 1990; Langley, 1988). But there is an opposite line of argument, which discounts their contribution to SDs. It has been convincingly argued that much of the actual

decision-making make take place outside FPSs (e.g., King, 1983; Sinha, 1990). It seems therefore a fruitful research question, to explore empirically this link between formal planning systems and strategic DMPs.

Performance. Since virtually all strategic initiatives require resources, a 'resource perspective' may be added to the determinants of SD processes (Bourgeois, 1981; Pfeffer and Salancik, 1978). Research relating past performance to strategic DMPs is limited (Rajagopalan *et al.*, 1993). Much research investigates performance in relation to the content of strategy, planning, and strategy formulation processes, rather than SDs. An exception is the study conducted by Fredrickson (1985), who found that past performance had a negative effect on the comprehensiveness of strategic DMPs.

More than three decades ago, Cyert and March (1963) reached the same conclusion, i.e., that superior performance is expected to lower the intensity with which organizations will 'search' for and analyze information. In the same vein Bourgeois (1981) and March and Simon (1958) suggested that slack resources offer organizations the 'luxury' of 'satisficing', and suboptimal decision-making. The above arguments lead us to hypothesize that performance may be *negatively* related to rational decision-making.

Against this, others have found empirical support for a positive relationship. For example, Smith *et al.* (1988) found that, for both small and larger firms, comprehensive outperformed less comprehensive decision-making, and Jones, Jacobs, and Van't Spijker (1992) reported consistently positive relationships between organizational effectiveness and comprehensiveness in decision-making. Taken together, empirical results in this area are conflicting. This may be due to the moderating effect of other omitted variables (e.g., environment) or to model underspecification which characterizes much of the research (Rajagopalan *et al.*, 1993).

Firm size. Company size is usually considered to be of importance in the context of SDs. Again, the evidence is far from clear or generalizable. Fredrickson and Iaquinto (1989) reported that larger size is associated with comprehensiveness in strategic decision-making. Child (1972) also suggested that size affects the framework of

organizational decision-making. However, it is worth mentioning that Dean and Sharfman (1993a) as well as the Bradford studies (e.g., Hickson *et al.*, 1986) found no differences in strategic DMPs which could be attributed to size.

Corporate control. Several studies have provided evidence on the important implications of corporate control in strategic DMPs (e.g., Lioukas, Bourantas, and Papadakis, 1993; Mintzberg, 1973). The *type of ownership or control type* is a variable which has attracted much attention, especially lately in the literature on markets for corporate control and privatization. If it is hypothesized that nationally owned enterprises display a national style of management and national 'culture' in decision-making, while subsidiaries of multinationals may represent an implanted (probably more 'sophisticated') decision-making style, then it will be of interest to test whether important differences can be detected. The Bradford group of researchers have provided evidence of the existence of different decision-making patterns between British and multinational companies operating in Britain (Mallory *et al.*, 1983). Moreover, as suggested by several authors, public vs. private ownership may decisively affect decision-making practices and processes (e.g., Lioukas *et al.*, 1993).

Towards an integrated research framework

It is evident from the above brief review that: (1) there has been little research on the influence of broader context on SDs; (2) most of the studies focus on a limited number of antecedents while ignoring other important sources of influence on strategic decision-making processes (model underspecification); (3) most of the studies focus on just one characteristic of the process (i.e., comprehensiveness, politics, decentralization), despite the fact that strategic DMPs are multidimensional in nature; (4) in addition, much of the evidence produced is contradictory and far from establishing a coherent theory.

Therefore, we are not able to answer the question '*what are the key influences on the process of making SDs?*' Is it the external environment as the population ecologists would argue, or is it the top management (CEO and top management team (TMT)) as the proponents of management choice theories would contend? Do internal

enterprise characteristics affect the process? Do different decision-specific characteristics, as perceived by management, lead to different treatment of the decision? Does past performance play any role in influencing the making of SDs? What is the role and significance of formal planning systems?

Since these questions remain largely unanswered (Bateman and Zeithaml, 1989; Bryson and Bromiley, 1993; Pettigrew, 1990; Rajagopalan *et al.*, 1993, 1997; Schneider and De Meyer, 1991), it seems that what is needed is an exploratory approach which views the process of making SDs as subject to multiple influences, and examines the effects of factors in three contextual domains: decision-specific characteristics, top management, and context.

The present paper addresses these issues by formulating an integrative model of contextual influence on strategic DMPs. The dimensions of the strategic DMP are shown on the right-hand side of Figure 1. The decision-specific characteristics are depicted on the left-hand side. The top block of the diagram indicates management factors while the lowest block indicates broader contextual factors (corporate environment and internal firm characteristics).

This study operationalizes these dimensions/factors, and tests their effect on the DMP. The components of the model, together with operationalization and measurement issues, follow the discussion of our methodology. The exploratory nature of the paper should again be stressed. Given that previous studies have reached widely conflicting conclusions the paper aims to provide evidence as to which domains pertaining to the SD process are more important, and which factors within each domain actually influence various dimensions of the process. Further research will be needed to advance and test particular hypotheses.

RESEARCH METHODOLOGY

Data collection and sampling issues

To achieve these objectives an ambitious study was designed and executed, which took more than 14 months of intensive fieldwork. This can be characterized as a multimethod, in-depth field research study (Snow and Thomas, 1994). The data sources include: (1) initial CEO interview;

(2) semistructured interviews with key participants; (3) completion of two different questionnaires: one general for the CEO and one decision-specific for the key participant(s); (4) supplementary data from archival sources (e.g., internal documents, reports, minutes of meetings).

The research covers 70 SDs in 38 manufacturing firms in Greece. A sequence of steps was followed in order to secure the reliability of data based on participant recall. The process is described in Appendix 1. The sampling frame comprised all manufacturing enterprises in Greece with more than 300 employees, drawn from three industrial sectors (food, chemicals, and textiles)—a total population of 89 companies of which 38 participated in the research. The average size of the companies in the sample is 730 full-time employees. In most cases two SDs were studied in each firm, resulting in a sample of 70 SDs.

The response rate achieved (approximately 43%) is very high considering the intrusive nature of the research and the fact that top management was asked to devote several hours of its time. Comparison between respondent and nonrespondent firms on the basis of three objective measures (number of employees, total assets, and return on assets), verified the representativeness of the final sample.

Reliability and validity considerations

A study based on participant recall, though the dominant method of studying decision-making processes, may have inherent limitations (Bouchard, 1976; Huber and Power, 1985; Kumar, Stern, and Anderson, 1993). A number of procedures have been suggested to help reduce their impact, including the use of multiple informants (Kumar *et al.*, 1993). Even these methodologies do not guarantee objectivity. The *nature of the present research* (in-depth study of one or two SDs in each company, a separate CEO interview, use of archival data), *the specific features of the sample* (i.e., medium-sized enterprises, existence of few key informants in each SD), as well as the *effort* required to find informants to discuss in depth often delicate matters, relating to an SD, made it difficult to use multiple informants per SD and to aggregate their responses.

Several tactics were followed in an attempt to alleviate possible biases (Bourgeois and Eisenhardt, 1988; Huber and Power, 1985; Kumar *et*

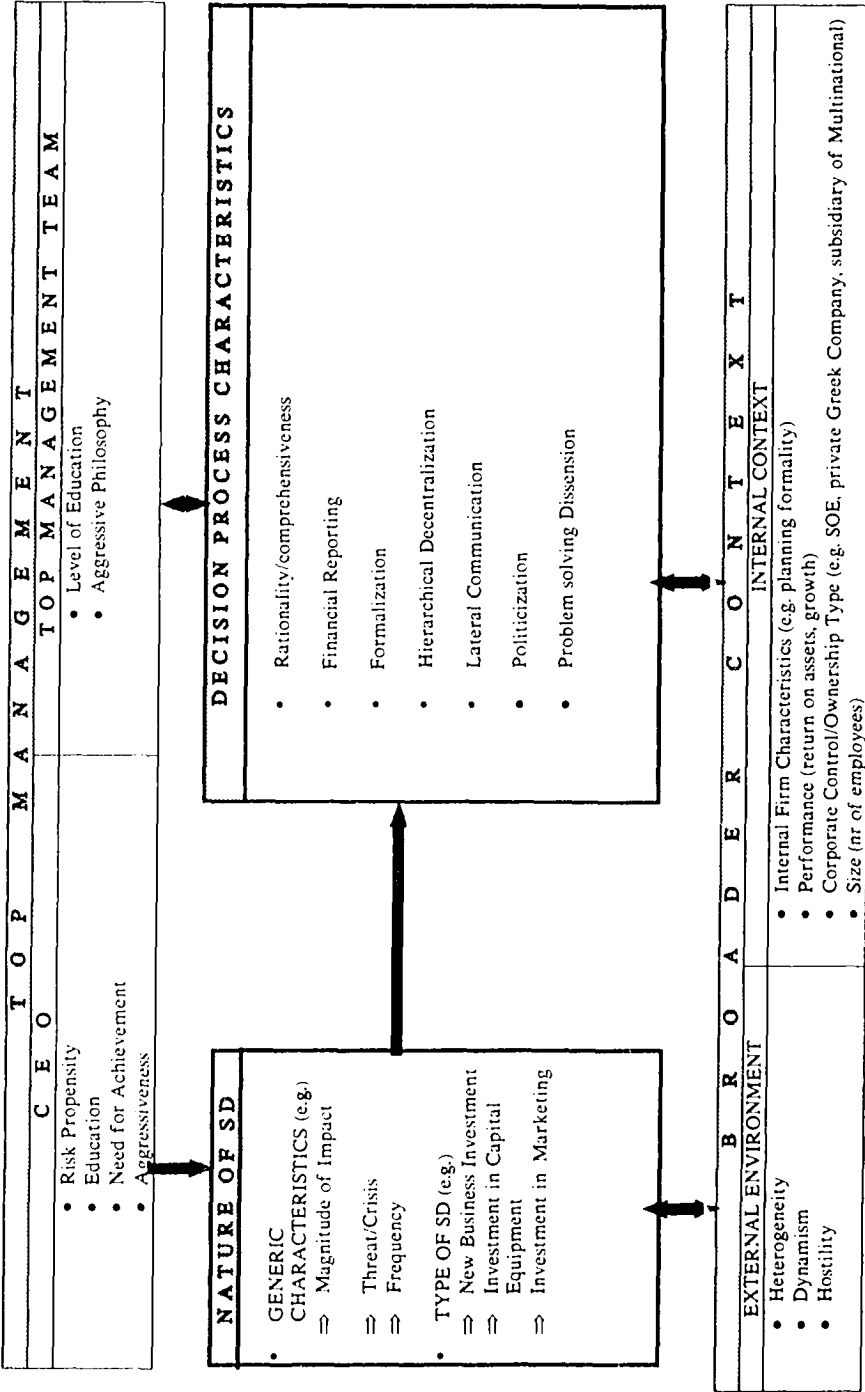


Figure 1. Factors influencing strategic decision-making processes

al., 1993). First, records documenting the process and its characteristics were collected prior to each main interview. Second, all the discussions were recorded. This tactic enabled the researcher to have direct access to the original discussion and pay attention to any part of it, at later stages. Interview notes, impressions, and noteworthy points were written down during the first 24 hours after the completion of the interview (Bourgeois and Eisenhardt, 1988). These improved knowledge of the process.

Third, particular caution was exercised to minimize distortion and memory failure problems notably by selecting *recently taken decisions* (Mintzberg *et al.*, 1976), by interviewing only *major participants* having an intimate knowledge of the process (Kumar *et al.*, 1993), by adopting a 'funnel sequence' method in conducting interviews (Bouchard, 1976), by cross-checking interview-derived information against other managers' recollections (e.g., CEOs), by using *additional informants in cases of incomplete information*, and by cross-checking interview data with *other company sources* available (e.g., documents, reports, minutes of meetings).

In addition, a *small number of key process variables* were measured independently (e.g., planning formality, internal reporting activities) based on archival data. Statistical tests showed that managers' recollections were significantly correlated with the selected archival data. In addition, both subjective and objective data on corporate performance were obtained. The two methods provided similar results, reinforcing belief in the validity of the data. However, managers' recollections were used in measuring most of the variables in this study.

Another major consideration was the minimization of *common method bias*. To correct for such effects the following precautions were taken. First, a number of variables (e.g., size, performance) are archival, obviating any danger of common method bias with them. Second, two different questionnaires (general and decision-specific) were used and they were answered by different managers (i.e., dependent and independent variables were answered by different persons). Third, the items used in the analysis were distributed throughout a lengthy interview. Fourth, scale anchors were reversed in several places to reduce and compensate for the development of response patterns. These precautions

afforded some confidence that common bias was not a problem. Finally, the willingness and sincerity with which top managers participated in the research and the interest they showed during the interviewing process provide a further reason to believe in the face validity of their responses.

OPERATIONALIZATION AND MEASUREMENT OF SD PROCESSES

The dimensions along which SD processes were measured in this study are: *comprehensiveness/reality*, extent of *financial reporting*, existence of a set of *formalized rules* guiding the process, *hierarchical decentralization*, *lateral communication*, *politicization*, and *problem-solving dissension*. These are indicated in Appendix 2 along with their measurement details, reliability levels, and the sources from which they were derived.

As outlined in the theoretical framework, ample theoretical support can be found for the above dimensions. For example, the framework adopted is similar to that of Cray *et al.* (1988). Indeed, the scrutiny dimension is captured by the comprehensiveness and financial reporting dimensions, the interaction dimension is captured by the politicization and problem-solving dissension dimensions, and the centrality dimension is similar to our hierarchical decentralization and lateral communication dimensions.

Moreover, the reliability levels are very satisfactory. Especially for the comprehensiveness/rationality construct, they are higher than those reported by other researchers (e.g., Dean and Sharfman, 1993b; Fredrickson, 1984; Smith *et al.*, 1988). It is noteworthy that despite the fact that the resulting variables tap dimensions of the same phenomenon (i.e., the strategic DMP) they do not have very high intercorrelation coefficients (see Table 1). All, however, are in the expected direction. For example, the formalization construct is positively and significantly related to the notion of rationality, an association argued by several researchers (e.g., Langley, 1989).

Table 1. Correlations among SD process dimensions

	Mean	S.D.	1	2	3	4	5	6	7
1. Comprehensiveness/rationality	3.26	0.73	1.00						
2. Extent of financial reporting activities	0.00 ¹	1.00	0.46***	1.00					
3. Form formalization	2.77	0.54	0.42***	0.35**	1.00				
4. Hierarchical decentralization	2.23	0.56	0.62***	0.35***	0.27*	0.54***	1.00		
5. Lateral communication	2.97	1.34	0.31**	0.10	-0.11	0.14	0.07	1.00	
6. Politicization	2.50	1.27	-0.01	-0.12	-0.14	0.01	-0.08	0.27*	1.00

*Significant at 0.05; **Significant at 0.01; ***Significant at 0.001.

¹Variables marked with an asterisk are factors (principal components) incorporated in the analysis.

SELECTION AND OPERATIONALIZATION OF EXPLANATORY VARIABLES

Measuring decision-specific characteristics

To derive generic dimensions, the present research specifically measured 16 decision-specific characteristics, which would apply across the diverse SDs in our sample, and which were based on the literature review. These issue characteristics are shown in Table 2.

These initial variables were factor analyzed, using varimax rotation method, and six factors were derived. Table 2 presents the results of the factor analysis investigation. It is worth noting that all factors reflect distinct, internally consistent patterns suggesting generic characterizations of SDs. A specific name is assigned to each factor based on the variables loading. The names of these factors are: SD's magnitude of impact, uncertainty, amount of pressure anticipated by the participants, frequency/familiarity, extent to which the SD was perceived as a crisis situation, and finally extent to which the SD emerged through the formal planning system (planned vs. ad hoc). Appendix 3 presents details on variable measurement, sources in the literature from which these were drawn, and their reliability levels.

But these generic characteristics may not cover the true nature of a project. So further *objective* decision-specific constants were added describing any idiosyncratic aspects of SDs not accounted by the characteristics included (see Hickson *et al.*, 1986; Shirley, 1982). For the purposes of the present paper, a fourfold classification of SDs is identified: *new business investment decisions* (e.g., acquisitions, mergers, joint ventures, new company establishment), *investments in capital*

equipment (e.g., expansion of production equipment, storing facilities, modernization of production equipment), *investment in the marketing domain* (e.g., new product introduction, marketing channels), and finally *internal reorganization investments* (e.g., investments in information systems, internal reorganization). All these are measured using dummy (0/1) variables.

Measuring top management characteristics

Both *personality and demographic* variables are used to measure characteristics of the CEO and the TMT. This would help find out whether it is the CEO, or the TMT, or both, that play an important role in the making of strategic decisions.

CEO's personality and demographic characteristics

Two CEO personality characteristics are incorporated in the present work: need for achievement, and risk attitude. *Need for achievement* is, according to several writers, one of the basic characteristics positively associated with entrepreneurial success (Gough, 1976). In the present study Steers and Braunstein's (1976) scale is used (see Appendix 3). *Attitude towards risk* (risk propensity) is a psychological disposition of individuals to show varying degrees of risk-taking or risk avoidance behavior. It is among the major personality dimensions which was found to be associated with various strategic configurations. The particular construct used is derived from Jackson (1976), and Eysenck and Wilson (1975). Appendix 3 describes how these dimensions were operationalized and measured. The resulting

Table 2. Factor analysis results of decision specific characteristics

Decision-specific characteristics	Factor loadings ^a					
	Factor 1: Magnitude of impact	Factor 2: Uncertainty	Factor 3: Threat/crisis	Factor 4: Pressure	Factor 5: frequency/ familiarity	Factor 6: 'Planned' vs. 'ad hoc'
SDs' impact on strategy	0.805					
Radicality of changes	0.782					
SDs' magnitude of impact	0.760					0.446
Precursiveness of the SD	0.743				0.352	
Seriousness of consequences	0.608					
Action uncertainty		0.731				
Overall uncertain nature of SD		0.726				
Information uncertainty		0.647	-0.266			
Extent of crisis perception			0.847			
Perceived threat of loss			0.819		0.262	
Time pressure to make the SD				0.903		
Pressure on the organization	0.313			0.771		
SD as part of another decision					0.793	
Frequency of occurrence	-0.401	-0.282			0.572	-0.470
Familiarity with the SD		-0.437			0.489	
'Planned' vs. 'ad hoc'		-0.263				0.847
Eigenvalue	3.59	2.42	1.87	1.38	1.10	1.04
Percentage of variance explained	22.4	15.1	11.7	8.6	6.9	6.6
Cumulative percentage	22.4	37.6	49.3	57.9	64.8	71.4

^aAlpha factoring method was used, together with varimax rotation and Kaiser normalization. Factor loadings less than 0.25 are not reported.

reliability coefficients are satisfactory, providing reliability levels similar to those reported in other studies (e.g., Budner, 1962; Steers and Braunstein, 1976).

As regards CEO's demographic characteristics several variables have been used for describing characteristics of 'managerial elites'. The present research uses two variables: (1) CEO's *length of service* in the company (number of years with the company); and (2) CEO's level of *education*. Both variables have been reported to have a profound influence on organizational processes and outcomes (e.g., Finkelstein and Hambrick, 1990; Hitt and Tyler, 1991).

TMT characteristics

Two measures were used. The first measures the *degree of aggressiveness* of what Hage and Dewar (1973) call the 'behavioral elite group' (i.e., the CEO and all those participating in major decisions). It draws from Khandwalla (1977) and Stein (1980), and is measured by three items expressing dimensions of the TMT's attitude towards risk and achievement. The first item measures the degree of 'beat-the-competition' attitude, the second TMT's risk propensity (i.e., attitude towards risky projects), and the third the top team's attitude to innovation. The combination of these three items is explained as TMT's aggressiveness towards competitors, innovation, and risky projects.

The second variable attempts to capture the *level of education* of what Hage and Dewar (1973) name as formal elite. It is an objective variable measuring the percentage of managers, down to the level of departmental heads, who are university graduates.

Broader context

Environmental context

Three environmental dimensions are measured using perceptions of top managers: (1) *environmental heterogeneity*; (2) *environmental dynamism*; and (iii) *environmental hostility (opposite to munificence)*. Appendix 3 describes how these dimensions were operationalized and measured. Cronbach alpha reliability coefficients are satisfactory, providing reliability levels similar to those reported in other studies which used the same measures.

Internal systems

For the purposes of the present work, planning systems are used as potentially very relevant to SDs (e.g., Sinha, 1990). In particular the variable *formalization of the planning effort* is used. It has been suggested by various researchers (e.g., Grinyr, Al-Bazzaz, and Yasai-Ardekani, 1986) that formalization is one of the most prominent characteristics of planning systems. The specific construct used is adapted from the work of Wood and LaForge (1981). Only seven of the initial 18 dimensions proposed by Wood and LaForge (1981) have been selected. These dimensions were preferred because they refer to the long-term planning conducted rather than to short-term budgeting practices (see Appendix 3). When factor analyzed the seven dimensions produce only one factor, further verifying the appropriateness of the modified scale used.

Corporate performance. Two objective measures of performance are used: first, *return on assets (ROA)*, which is viewed as an operational measure of the efficiency of a firm with regard to the profitable use of its total asset base (Bourgeois, 1980); second, *growth in profits*, indicating the trend in profitability improvement. This paper treats performance as an independent variable influencing the strategic DMP. To assure this, performance measures were calculated going 5 years prior to the decision studied. This adds confidence in testing whether past performance was a serious consideration when making the SD.

Firm size. To measure size this paper uses the log of full-time employees (e.g., Fredrickson, 1984).

Corporate control. Finally, to capture the effect of type of ownership control on decision-making practices two dummy (0/1) variables are used, distinguishing state-owned enterprises (SOEs) and private Greek companies from subsidiaries of multinationals.

DATA ANALYSIS CONSIDERATIONS

Given the number of variables involved, both dependent and independent, separate regression models were applied for each SD dimension. The

results reported here present the 'best' regression equation, i.e., the equation which provides the maximum number of significant variables. These would give a first indication of the relative influence of the explanatory variables on each independent variable.

A consideration in presenting the models was whether a full equation model should be presented along with the best equation model, for each of the dependent variables. The size of the sample (i.e., 70 SDs) theoretically would impose limits on the number of variables to be introduced simultaneously. The degrees of freedom would not be adequate to assure reliable and valid results in a full variables version. Moreover, the research is exploratory and in most cases there are not prior strong reasons to expect relationships with all variables. Versions with full equations can be obtained from the first author upon request. These do not change the pattern emerging.

Each model was derived by both backward elimination and stepwise regression methods in corroboration. In most cases the results were identical. In the very few cases where the two methods provided different equations, further tests were attempted by entering and removing variables from the equation, and finally the model with the best explanatory power was selected.

A second consideration refers to possible multicollinearity effects. Table 3 presents the intercorrelations between the independent variables. Only two out of over 300 single correlation coefficients are above 0.50, and then only slightly, indicating that intercorrelations are not unduly high. To safeguard for multicollinearity effects, the procedures outlined by Belsley, Kuh, and Welsch (1980) were followed. According to this, condition indexes were calculated for each of the regression models of Table 4. These condition indices were far below the suggested warning level of 10.0 for mild collinearity. Thus, no serious problems are expected (Belsley *et al.*, 1980).

Several other warning signals were also inspected, in order to detect possible multicollinearity problems. In none of the equations is there a substantial R^2 accompanied by statistically insignificant coefficients, to raise suspicion about possible multicollinearity problems. The stability of regression coefficients was also tested. Here, several runs were conducted by dropping or adding independent variables in the equation. None of these trial runs has indicated any extra-

ordinary change in regression coefficients. Most of the regression coefficients appear to produce algebraic signs according to theoretical expectations and the coefficients for each regression show a high consistency with single correlations.

RESULTS

Table 4 summarizes the results of the paper. All models afford good to satisfactory predictions of the extent to which each SD process dimension is determined by the decision-specific, management, and contextual characteristics. The explanatory power of the models ranges from 0.39 to 0.63 and on average exceeds 0.50. Considering the cross-sectional nature of the research, and comparing the results to similar efforts, this is seen as very satisfactory (e.g., Dean and Sharfman, 1993a; Stein, 1980).

Comprehensiveness/rationality

Overall, results show that comprehensiveness/rationality is affected by *decision-specific characteristics* and *internal context*. Environment and management factors are insignificant. The specific coefficients of Model 1, Table 4 suggest that SD's *magnitude of impact* and *type of SD* are the most important decision-specific characteristics while *planning formality*, *corporate performance*, *firm size*, and ownership/control type are the dimensions of the internal context which significantly influence comprehensiveness in the SD-making process.

Results are in line with Dean and Sharfman (1993a) and Stein (1980), who suggest that the perceived *magnitude of impact* of a decision is among the strongest explanatory variables of decision-making behavior, as decision-makers act more comprehensively/rationally when decisions imply important consequences. It is also noteworthy that SDs for new business investment and marketing type seem to be subject to less comprehensive/rational analysis than SDs on capital investment and internal reorganization. This follows from the negative coefficients of the respective dummies.

As regards *internal context*, all dimensions appear to be significant. Results support the normative view that formal planning systems (FPSs) contribute to more rational decision-making

Table 3. Intercorrelations among independent variables

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1. Magnitude of impact	3.29	0.75	1																					
2. Thread/crisis	3.04	1.26	0.9	1																				
3. Decision uncertainty	2.44	0.98	-0.16	0.1	1																			
4. Frequency	2.97	0.80	0.3	1.3	-0.26	1																		
5. Pressure	4.44	1.53	3.3	3.0	0.3	0.5	1																	
6. 'Planned vs. ad hoc'	3.81	1.08	4.2	1.0	-0.30	2.0	1.3	1																
7. Heterogeneity	2.71	0.93	1.3	-1.3	-0.4	-0.19	1.9	3.5	1															
8. Dynamism	3.17	0.87	2.3	-2.5	-2.6	0.9	1.6	2.1	4.4	1														
9. Hostility	2.94	0.74	-1.9	0.5	3.8	-0.9	-0.4	-1.9	-1.7	-3.2	1													
10. Planned formality	3.04	1.13	2.6	1.9	-0.4	1.7	1.7	4.7	3.1	2.1	-2.8	1												
11. CEO's need for achievement	2.15	0.63	-0.1	-0.26	0.0	-0.18	-0.13	0.3	4.7	3.6	0.2	-0.5	1											
12. CEO's risk propensity	3.14	0.56	2.4	1.5	-1.6	-0.1	3.9	1.4	2.4	3.6	-0.9	2.1	-0.1	1										
13. CEO's no. of years with company	18.14	10.3	-0.1	-1.8	0.0	2.5	-1.7	-0.2	-1.3	-2.5	-1.2	1.7	-0.7	-2.6	1									
14. CEO's level of education	3.36	0.89	0.0	-0.1	-0.1	1.0	0.2	0.1	-1.2	3.0	0.7	1.1	0.5	1.7	-3.9	1								
15. TMT's level of education	85.0	16.6	0.8	2.5	-3.1	1.8	2.9	2.7	0.7	1.0	-4.6	4.4	-4.3	1.9	0.0	1.7	1							
16. TMT's aggressive philosophy	3.35	1.18	3.7	-1.3	-1.3	1.3	2.6	3.4	4.2	5.5	-4.2	5.3	1.2	4.4	0.1	1.6	2.1	1						
17. Return on assets	0.997	3.39	0.3	-0.4	1.1	1.8	1.3	1.0	1.3	1.6	0.1	2.8	-1.4	0.8	2.3	1.0	0.8	4.5	1					
18. Growth in profits	1.29	5.38	0.3	0.3	-3.3	-0.7	2.2	1.7	1.4	1.7	-3.3	1.6	1.0	1.0	-0.6	0.1	2.8	2.1	1.2	1				
19. Size	2.76	0.27	-2.2	1.6	1.0	-0.6	-0.4	-0.7	-0.5	-1.9	0.0	0.0	1.1	-2.1	0.6	-0.4	0.5	-3.4	-1.3	1.7	1			
20. State-controlled enterprises	0.19	0.39	-1.7	2.5	1.2	-2.6	8	-1.9	-0.5	-1.2	0.9	-1.8	-0.8	-0.2	-2.3	-0.3	2.1	-4.3	-3.7	-0.7	3.7	1		
21. Private Greek companies	0.47	0.50	-0.1	-1.4	0.7	0.8	-2.7	-2.1	-3.0	-2.8	-3.3	-1.0	-0.4	0.6	-0.3	-3.4	-0.6	2.7	2.6	-0.4	-0.8	-4.5	1	
22. Subsidiaries of multinationals	0.34	0.48	1.5	-0.6	-1.7	1.3	2.2	3.8	3.5	3.9	-4.2	4.7	1.6	0.5	-0.3	0.5	1.8	4.1	0.3	1.1	-2.3	-3.5	-6.8	

Decimals of correlation coefficients were omitted.

For coefficients greater than $r > 0.275$ $p < 0.01$;For coefficients greater than $r > 0.20$ $p < 0.05$; For coefficients greater than $r > 0.35$ $p < 0.001$.

Table 4. Summary table of best models of regression analyses^a

Variables	Model 1: Comprehensiveness/ rationality	Model 2: Financial reporting	Model 3: Formalized rules	Model 4: Hierarchical decentralization	Model 5: Lateral communication	Model 6: Politicization	Model 7: Problem-solving dissension
Decision-specific characteristics							
A. Generic characteristics							
1. Magnitude of impact	0.35**	0.19*	-0.20*	0.41***	0.48***		
2. Threat/crisis		0.15*		0.20*			
3. Decision uncertainty		-0.16*	-0.19*			0.41***	0.60***
4. Frequency					0.13*		
5. Pressure		0.25*	0.25*	-0.25*	-0.19*		0.20*
6. "Planned" vs. "ad hoc"							
B. Type of SD							
7. New business investment type	-0.27**			0.42*			-0.38*
8. Investment in capital equipment		0.20*		0.64***			-0.39*
9. Investment in marketing	-0.19*	0.19*		0.37*			-0.40*
10. Investment in internal reorganization							
Top management characteristics							
1. CEO's need for achievement							
2. CEO's risk propensity			-0.34**				
3. CEO's number of years with the company		0.23**		0.29**			
4. CEO's level of education					0.34***		
5. TMT's level of education							
6. TMT's aggressive philosophy	0.21*		0.35**				
Broader context							
A. External corporate environment							
1. Environmental heterogeneity							
2. Environmental dynamism							
3. Environmental hostility							
B. Internal context							
Internal firm characteristics							
1. Planning formality	0.29**				0.25**	0.26*	
Corporate performance							
1. Return on assets	0.20*	0.29**		0.33***			
2. Growth in profits							
Firm size (no. of employees)							
1. State-controlled enterprises (SOEs)	0.19*						
2. Private Greek companies	0.18*						
3. Subsidiaries of multinationals	-0.25*	-0.36***	-0.40***			0.39***	
Corporate control							
1. State-controlled enterprises (SOEs)							
2. Private Greek companies							
3. Subsidiaries of multinationals							
R ²	0.63	0.60	0.48	0.54	0.66	0.39	0.51
Adjusted R ²	0.58	0.54	0.43	0.48	0.63	0.35	0.45
F	11.6***	10***	10***	9***	24.4***	10.4***	9.2***

(Armstrong, 1982; Duncan, 1990; Langley, 1988). Contrary to the line of reasoning which understates the contribution of FPSs to decision-making (e.g., King, 1983; Sinha, 1990), here planning formality appears to be an important contributor to comprehensiveness in SD-making.

A positive relationship between corporate performance and comprehensiveness/rationality is obtained with *return on assets*. It appears that high levels of performance may produce enough resources to help in making better, more rational decisions; that may mean that high performers are 'offered the luxury' to invest in more analysis while poor performers may lack these slack resources. The opposite may also obtain: high rationality may lead to better performance thus reinforcing a positive relationship. In the same vein, others have argued that more rational decisions may themselves lead to better performance (Grinyer and Norburn, 1977-78; Smith *et al.*, 1988). In our case this explanation is less likely, given that ROA figures used concern previous years. The results seem to contradict the opposite school of thought, which suggests that superior performance may lower the extent to which organizations engage in rational decision-making (Bourgeois, 1981; Cyert and March, 1963; Fredrickson, 1985).

Size constitutes a significant explainer of comprehensiveness. This in line with the suggestions of previous work (e.g., Fredrickson, 1984; Fredrickson and Jaquinto, 1989; Mint/berg, 1973), which state that *size* entails more comprehensive/rational decision behavior.

Finally, both dummy variables measuring *control/ownership* appear to be significantly related to decision comprehensiveness/rationality. More specifically, using subsidiaries of multinationals as benchmarks, state-controlled enterprises seem to follow more rational processes, while enterprises of private Greek ownership appear to be less rational. This is an interesting result since it verifies the popular view that Greek private enterprises follow less comprehensive/rational DMPs when making decisions of a strategic nature, in comparison to subsidiaries of multinationals. That SOEs are closer to multinationals in this respect is unexpected. Maybe they have qualified staff and engage in more analysis, taking all the necessary time and effort to collect all necessary information and explore alternatives, in order to justify their final

and outside the organization.

The insignificant coefficients also provide useful suggestions. A striking result is the lack of significance of *top management characteristics*, since no variable loads significantly in Model 1. Only TMT's aggressive philosophy is marginally significant (at a 10% level). This seems at odds with current theory, which stresses the vital role of the CEO and/or the TMT on comprehensive/rational decision-making (Hambrick and Mason, 1984).

A similar observation can be made as regards *environmental variable*: in determining comprehensiveness, which runs against propositions of environmental determinism. We would expect environmental variables to influence rationality/comprehensiveness. Indeed, several researchers have argued for the significance of environmental heterogeneity in determining strategic processes (Lindsay and Rue, 1980; Smart and Vertinsky, 1984). These authors argued that managers who perceive their corporate environment as complex tend to employ more comprehensive strategies. Bourgeois and Eisenhardt (1988), in their study of strategic decision processes in high-velocity environments, concluded that effective firms follow the rational model in decision-making.

Others have argued that companies operating in stable environments follow rational-comprehensive processes in making and integrating strategic decisions (e.g., Cyert and March, 1963; Fredrickson, 1984; Fredrickson and Jaquinto, 1989; Hart, 1992). The argument behind this contention is that strategists usually find it difficult to rely on formal financial analysis, in-depth study, and rational processes when having to deal with unstable, high-velocity environments characterized by information scarcity and rapid change. Instead, they are obliged to take quick, bold decisions in many instances, relying on the available amount of information. In the same vein, companies operating in stable environments rarely face significant opportunities and thus when having to deal with such a situation they employ more rational processes.

Our results do not support either line of thought. On the contrary, they are in line with Smith *et al.* (1988), who reported a lack of any statistically significant relationship between environmental dimensions and rationality of strategic decision-making. However, one should con-

sider the results of the other dependent variables before rushing to conclusions.

Financial reporting

Financial reporting, a dimension of rationality typically applied in SD especially of an investment nature, is significantly affected by *decision-specific* characteristics, and some characteristics of the *internal context*.

More specifically, from a quick inspection of Model 2 in Table 4 it appears that two decision-specific characteristics, notably *magnitude of impact* and *emergence of the SD through planning*, *CEO's level of education* and *return on assets* are to be positively associated with financial reporting, while *private Greek ownership* has a negative association. Of note are the marginally significant associations (10% level of significance) provided by two other generic decision-specific characteristics.

First, results indicate that situations perceived as crises are actually associated with more financial reporting activities. This is in line with previous theoretical argumentation (Dutton, 1986). In general, one might argue that when adversity looms everyone might want to interpret and explain the situation in terms of financial analysis and reporting. Or, taking another view, the company may seek to exercise control and support the meaningfulness of its actions in the eyes of both internal and external stakeholders by relying on deeper financial reporting and analysis, since crises usually involve risks of a significant financial loss.

Second, financial reporting is negatively related to frequency. This result supports the view that frequent/familiar issues are dealt with by standard rules and analogies from memories. They are therefore associated with less analysis and comprehensive reporting of data (Marmaras, Lioukas, and Laios, 1992). Also the coefficients of the dummies 'investment in capital equipment' and 'investment in marketing' are marginally significant showing a higher level of financial reporting for these types of decisions, as against investments in internal reorganization.

As regards *top management*, only *CEO's level of education* is positively associated with financial reporting. Education level has been found to be related to the extent of people's information search and analysis (Dollinger, 1984). A highly

educated CEO is thus likely to demand more detailed information, leading to more financial reporting (Bantel, 1993). All other top management characteristics (e.g., CEO's need for achievement, risk propensity or tenure) appear to be insignificant.

From internal firm characteristics, again *performance* in terms of ROA is positively associated with financial reporting. An important finding is also the negative association between *private Greek ownership* and financial reporting. It implies that Greek private firms may rely less on formal financial reporting activities when making strategic decisions than multinationals. This strengthens our argumentation when discussing the results of the comprehensiveness/rationality model. SOEs are not different from multinationals.

Of note is the general lack of significance of external corporate environment. This is in line with the results obtained using the rationality/comprehensiveness construct. Interestingly, *size* does not seem to be significantly associated with financial reporting. These findings will be further discussed in later sections of the paper.

Rule formalization

Rule formalization in the SD process (Model 3, Table 4) is influenced by *decision-specific* characteristics (*decision uncertainty* and *emergence* through formal planning), *top management characteristics* (*CEO risk propensity*) and *corporate control type* (*Greek ownership*).

From *decision-specific characteristics*, *decision uncertainty* and *emergence* are negatively associated with rule formalization of SD process. Uncertainty, as used here, refers to specific decisions, as opposed to the uncertainty caused by the organizational environment. Results are in line with Thompson (1967: 134), who contends that in cases of high uncertainty managers act in an 'inspirational' manner, by making obsolete any formal procedures and rules usually followed. One can contend that high uncertainty about the decision may, contrary to the received (common) expectations, result in more intuitive processes (Daft and Lengel, 1986; Dean and Sharfman, 1993a) together with use of less formalized rules. Again, as expected, SDs *emerging* from the discipline of a *formal planning system* are found to follow more formalized paths.

As regards *management* we observe a negative association between *CEO's risk propensity* and rule formalization in taking SDs. Again, such a result is intuitively expected, since risk-takers usually break the bounds of organizational systems and formalities and influence the SD process towards more informal paths. TMT's aggressive philosophy is also related to more formalized rules.

Finally, *private Greek companies* seem to be lagging in rule formalization as the negative coefficient suggests. SOEs do not differ from multinationals.

Overall, however, we cannot argue that there exists a 'balanced contribution' of all domains (SD itself, management, and context) in explaining SD formalization. Of interest is the lack of significant impact of decision frequency, corporate environment, planning formality, past performance, and size. This suggests that SD process formality is independent from the formal planning machinery of the firm and external corporate environment and the other internal company characteristics. It is more a matter of decision-specific characteristics and top management choice.

Hierarchical decentralization and lateral communication

The extent to which the SD process is decentralized and allows participation of lower-level managers depends on the *decision-specific characteristics*, on *CEO tenure*, and corporate *profitability*. Moreover, the extent of lateral communication is determined by *decision-specific characteristics*, *top management team's aggressiveness*, and *internal firm planning formality*.

More specifically, several conclusions can be drawn from the results of Models 4 and 5, Table 4. From the decision-specific characteristics, particularly strong is the effect of *magnitude of impact*, followed by perceived *pressure* and *threat/crisis*. Results imply that SDs with important impact attract the collective attention of more layers in the hierarchy and more departments as revealed in Models 4 and 5. This corroborates Dutton *et al.* (1989), who argue that issues with great magnitude of impact imply high interconnectedness with other relevant issues. Therefore, such issues attract more collective attention and thus result in higher hierarchical decentralization and lateral communication.

Pressure has a negative coefficient, suggesting that when SDs are taken under pressure there may not be enough time to involve more levels and departments.

An interesting effect obtains for *threat/crisis*. This suggests that threatening situations result in more hierarchical decentralization. At first this is counterintuitive. A number of authors (e.g., Dutton, 1986; Herman, 1963) argue that centralization of authority is the expected outcome of crises, since two opposite forces clash. First, managerial elites undertake the responsibility of the whole effort to divert the crisis. Second, middle managers, feeling that the issue might be 'too heavy' for them to deal with, pass it to top management.

Milburn *et al.* (1987) provide an explanation for this counterintuitive result: their findings suggest that although centralization was the immediate outcome of crises, the actual intermediate response was decentralization of authority. This may be explained by the distributed character of information and expertise; if we admit that the source of vital information is middle management, centralization deprive top management of extremely useful data. Herman (1963) offered another explanation. He argued that the relationship between crisis and decentralization of authority is curvilinear. Thus, under situations which are characterized as 'mild crises' one may observe decentralization. By contrast, when crises become acute, authority centralization is found. Further investigating the descriptive statistics of the variable measuring the extent of perceived crisis, we may see that the variable is measured on a 5-point scale and has a mean of 2.51, which implies rather 'mild crises', on the average. This suggests that our sample of SDs may not include intense crises which are assumed to lead to hierarchical centralization and less lateral communication.

As regards the effect of *type of investments* on hierarchical decentralization, all dummy coefficients are significant, showing that only internal reorganization investments are relatively more centralized. On the contrary, none of the dummy variables is significantly associated with lateral communication.

Top management has two significant coefficients. In Model 4 the variable measuring *CEO's tenure* is positively related to hierarchical decentralization patterns. This may be explained by the fact that CEO's tenure may influence participation patterns by developing greater levels of social

integration, and possibly by including in the dominant coalition more managers from various layers (Wiersema and Bantel, 1992).

Similarly, *TMT's aggressive philosophy* appears significantly positively associated with lateral communication during SD-making. This is in line with the view that in order to follow an aggressive strategy top management may need more information and cross-departmental involvement. If we consider that individual departments possess specialized information and their alliance is crucial to implementation of an aggressive philosophy, it is plausible that the level of lateral communication may increase.

It is somewhat surprising, however, to find again that *corporate environment* has insignificant coefficients. None of the environmental variables seems to have any effect on hierarchical decentralization and lateral communication patterns during the making of SDs. This is more intriguing if we consider the results of various studies which have argued for close links between environmental characteristics and decentralization and communication. For example, Lindsay and Rue (1980) argue that environmental heterogeneity is associated with more hierarchical decentralization, and more lower-level involvement. Miller and Eriesen (1983) also suggested that an increase in perceived environmental heterogeneity is expected to complicate the administrative task, thus resulting in subsequent changes in structure (e.g., more lateral communication). In the same vein, Grinyer *et al.* (1986) contend that environmental stability favors the delegation of authority to lower levels in the hierarchy, during the planning process. Interestingly, none of these relationships are supported by our data.

Performance, expressed by ROA, is positively related to hierarchical decentralization. This is in line with the results presented by Bourgeois and Eisenhardt (1988) and others. They have reported that the more the power to make strategic decisions is delegated to the functional and divisional executives, the higher the performance of the firm. This line of thought assumes that greater participation (especially by middle managers) will have a positive impact on organizational performance by triggering two parallel, positive phenomena. On one hand, the involvement of more people in strategic DMPs increases the level of consensus among managers, produces a common understanding of the joint task, creates

a climate of shared effort, and facilitates smooth implementation of strategic decisions. Smooth implementation contributes in turn to higher performance (Wooldridge and Floyd, 1990). On the other hand, lack of involvement of employees other than 'strategic elites' in the process has been found to create implementation problems, including sabotage (Guth and MacMillan, 1986).

Secondly, middle managers act as information monitors and are usually the first to sense potential threats and opportunities in their own particular domains (Pascale, 1984). Increasingly, top management's ability to sense the emergence and meaning of various challenges encountered is seen as a critical strategic capability. Due to information overload, top managers may be less and less able to fully understand the world around them. According to this view, strategic DMPs in successful firms are more a product of a shared effort than deliberation by one person.

Two other results also seem important. First, *planning formality*, as expected, has a positive coefficient in Model 5, indicating that it is associated with higher lateral communication. Second, *corporate control* does not appear to influence decentralization and communication patterns. So there may be no significant differences between the various types of enterprises—state, private, foreign—in decentralization and communication, when taking SDs.

Politicization and problem-solving dissension

Politicization and problem-solving dissension (Models 6 and 7, Table 4) are mainly influenced by *decision-specific characteristics* (uncertainty and pressure), one *external environmental* characteristic (*heterogeneity*) and certain *internal context* characteristics (e.g., planning formality, performance, and corporate control).

Both politicization and problem-solving dissension seem to be influenced more by *SD uncertainty* and less by other characteristics such as impact, threat/crisis, or pressure. This is in line with Lyles (1981) who, based on case evidence, argued that uncertainty about certain aspects of an issue (i.e., definition) may raise politicality in the problem formulation process. Indeed, when uncertainty exists (for example, about the actions to be taken and/or the information to be collected), one may expect to find both a divergence of opinions during the initial stages of

problem formulation, and a surge of political activities during the issue resolution process.

Interestingly *pressure* situations are found to have a positive effect on problem-solving dissension among participants. It seems that pressure situations may intensify dissension as many times they call into question the efficacy with which the dominant coalition has acted in the past to preserve organizational interests, and threatens the power base of managerial elites (Dutton, 1986). It is not at all unexpected to witness what Herman (1963) has called 'factionalism'; i.e., various units or departments favor opposite views about the proper reaction to the problem. It is also interesting to note that all dummies for type of decision have negative coefficients. This suggests that all investments cause less dissension than internal organizational SDs.

Environmental factors also seem to have no significant effect on politicization, while environmental heterogeneity appears to negatively influence problem-solving dissension. This latter result is contrary to expectations. For example, Dess and Orger (1987) argue for an inverse relationship between environmental heterogeneity and consensus on goals, since complexity gives rise to more possible points of conflict among managers and makes consensus more difficult to achieve. Others (e.g., Lyles and Mitroff, 1980) argued along similar lines.

A positive relationship obtains between politicization and *planning systems* formality. This suggests that planning formality has a positive influence on politicization. Results corroborate the prevailing view that FPSs encourage political behavior (Langley, 1988; Rhyne, 1986) since managers may perceive planning systems as a means through which personal views are communicated, political aspirations take effect, and political activity may develop.

Of note is also that both politicization and problem-solving dissension are found to be positively related to *growth in profits*. We will draw attention to this finding in our discussion section.

The positive statistical significant association between politicization and *SOEs* may be attributed to the multiplicity of internal and external interests in the context of SOEs. The fact that numerous parties may intervene and try to skew the output of the decision process in their preferred direction may raise politicization levels in SOEs relative to other categories of enterprises.

Of note is the general absence of *top management characteristics* in influencing both political activities and problem-solving dissension. Results support the view that the emergence of internal politics and dissension depends more on the decision-specific characteristics and certain characteristics of the external and internal context (environmental heterogeneity, planning formality, performance), rather than the characteristics of the decision-makers themselves. This appears to be at odds with Dean and Sharfman (1993b), who have reported that political behavior (among others) stems from the characteristics of the decision-making group (interpersonal trust).

DISCUSSION

Overall, the results of the paper support the view that for understanding strategic DMPs in depth, an integrative model which includes decision-specific, management, environmental, and organizational factors is needed. Results suggest that strategic DMPs are shaped by the interplay of these factors. Neither the external control model (environment), nor the strategic choice model (decision-makers), nor the corporate inertial model (size), or the resource availability (performance), adequately explain actual strategic decision-making behavior.

The most striking finding was the dominant role of *decision-specific* characteristics in determining decision processes. To the best of the authors' knowledge this is the first time that the dominant role of decision-specific characteristics (generic attributes and objective categorization) is verified in the context of SDs. The specific results show that the generic characteristics of an SD, such as its perceived magnitude of impact, frequency/familiarity, its uncertainty, its threat/crisis component, and whether it emerges through discipline of the planning system of the firm, significantly influence dimensions of the DMP, more than other environmental, organizational, and managerial factors.

Somewhat similar results were obtained by Meyer and Goes (1988), in their study of innovation assimilation. In assessing the comparative influence of various contextual domains on innovation assimilation they found that environment, organization, and leadership, taken together, were relatively poor predictors of innovation. In con-

fast very good predictors proved to be the innate attributes of innovations.

The generic decision-specific characteristics tested in the present study may not be exhaustive. This is obvious from the statistically significant dummies expressing types of decisions. This means that the objective type of SD variables introduced offer a unique additional explanatory power, not captured by the generic decision-specific characteristics included. It also calls for a search for additional 'generic' SD characteristics which may, when included, minimize any remnant effect of dummies. This, however, would require further research.

New business investments and investments in marketing exhibit less association with rationality in comparison to capital equipment investments and internal reorganizations. Investments in capital equipment and marketing exhibit more financial reporting in comparison to other investments. Investments in internal reorganization seem to be hierarchically more centralized in comparison to other investments. Also internal reorganization is accompanied by more problem-solving dissension in comparison to all other types of SDs.

The study has also established the relative importance of *top management characteristics*. Certain CEO characteristics entered significantly into the regression models and influenced financial reporting, formalization, and hierarchical decentralization. This implies that the contribution of CEO characteristics have also their own effect when controlling for other contextual factors. These results are in line with research reporting that CEO personality and demographic characteristics are related to aspects of strategic DMPs (e.g., Miller and Toulouse, 1986).

In addition to CEO characteristics, TMT aggressive philosophy appears to influence rule formalization and lateral communication and only weakly comprehensiveness/rationality. It is also worth noting that both the CEO and the TMT appear to be insignificant in influencing such dimensions as political activities and problem-solving dissension. This may be explained by the fact that executives do not always have complete latitude of action (Hannan and Freeman, 1977). There exist conditions of restricted discretion where TM becomes less important and other factors as corporate control, and firm characteristics or decision-specific characteristics become more significant in influencing politicality in SD making.

Overall, regression results support the view that both CEO's and TMT's characteristics have their effects in SD processes and are in line with Kets De Vries and Miller (1986) and Nahavandi and Malekzadeh (1993). This may lead us to lend credence to the 'upper echelons view' of organizations, and put into dispute the allegations of population ecologists (e.g., Hannan and Freeman, 1977) who consider TMT to be but a passive agent.

As regards external *corporate environment*, we found only one significant coefficient; namely, that environmental dynamism has a negative effect on problem-solving dissension. All other environmental variables we found to be largely insignificant. Overall, our results contradict researchers who argued that environmental factors as opposed to internal organizational factors are the primary sources of influence on SDs (e.g., Hannan and Freeman, 1977; Jemison, 1981).

No support was found for the role of environmental heterogeneity/complexity on strategic DMP. Rajagopalan *et al.* (1993) argued that the degree of *environmental complexity* in a firm's operating environment directly impacts the amount and nature of information that has to be processed by decision-makers. Research on cognitive processes also suggests that environmental heterogeneity affects SD process characteristics such as comprehensiveness, and leads to greater use of cognitive simplification processes (Schwenk, 1988). None of these are supported by our results. Again, environmental hostility was found to influence none of the characteristics of SD process. The argument that organizations in hostile environments follow more rational decision processes (Dess and Beard, 1984; Rajagopalan *et al.*, 1993) receives no empirical support.

In an attempt to explain this lack of dominance of the external control model, several speculative assumptions may be advanced regarding the particular country from which results are drawn. Schneider and De Meyer (1991) reported that Latin European managers, in contrast to other Europeans, may be characterized by an attitude of having limited control over the external environment. Thus, they may direct their effort towards controlling the immediate, internal environment, and adjust DMPs accordingly. Although speculative this conjecture provides a fruitful avenue for research in comparative decision-making practices.

Internal firm characteristics show more sig-

significant effects on DMPs. Firstly, formal planning systems appear to have a positive influence on three aspects of the DMP: comprehensiveness, lateral communication, and politicization. This is in line with theoretical and normative speculations arguing that planning systems lead to more rational decision-making (Armstrong, 1982; Duncan, 1990; Langley, 1988). Again, results corroborate the prevailing view that formal planning systems encourage both lateral communication (Langley, 1988; Tregoe and Tobia, 1991) and political behavior (Langley, 1988; Rhyne, 1986).

Concerning formal planning systems we should note the difference with another dimension which in the course of this research was treated as a project characteristic rather than as an internal firm characteristic, i.e., the *emergence of an SD through the formal planning system*. This refers to the decision whether to handle an SD in the formal planning machinery or treat it ad hoc outside the planning system, and is related to the initial stages of project formulation. These two variables are conceptually distinct and their intercorrelation is not unduly high ($r=0.47$). The results suggest that both have a significant influence on strategic DMPs.

Another set of interesting relationships revolves around the significance of corporate *performance* in determining decision processes. ROA provides significant positive associations with rationality, financial reporting, and hierarchical decentralization. Profit growth in turn is highly related to politicization and dissension. So different performance aspects appear to influence different dimensions of the process. Past profitability may lead to more rationality and decentralization of DMPs. Growth in profits may lead to internal politics and dissension. The latter is an interesting finding which deserves attention. It may be that high growth of profits over time raises internal conflicts as to where these resources should be invested. Particularly telling was the example of a fast-growing company in the food sector which was considering investing a sizable part of its retained earnings. The marketing department wanted major investments in new products and channels of distribution, while the production department supported a single investment in state of the art computerized storing facilities. The process of deciding where to invest these surplus resources was a highly political one.

Size is found to be largely insignificant in

almost all regression models except for comprehensiveness/rationality, which appears to increase with size. A similar pattern of associations was reported by Dean and Sharfman (1993a). This result seems to be at odds with the conventional wisdom that as companies grow they tend to move towards more procedural and formalized decision-making (e.g., Mintzberg, 1973).

Finally, it appears that *control type* has a significant impact on several aspects of strategic DMPs. Indeed, enterprises under state ownership (SOEs) seem to apply more comprehensiveness/rationality, and more politicization, when making decisions of a strategic nature. This is in line with the view that in the context of SOEs political and economic considerations coexist (e.g., Lioukas *et al.*, 1993). As strategic decisions in SOEs are usually subject to scrutiny or influence by strong stakeholders the decision-takers may take pains to demonstrate that they act rationally and to justify their major decisions both inside and outside the company (Dean and Sharfman, 1993a; Romanelli and Tushman, 1986). This explains the positive relationship between comprehensiveness and SOEs. The positive statistically significant association between politicization and SOEs may be attributed to the fact that numerous parties, not only from inside but also from the outside of the company, may intervene and try to skew the output of the decision process in their preferred direction. Such an activity may raise politicization.

By contrast in *private Greek companies* less rational processes, less financial reporting, and less rule formalization appear to prevail. Results seem to comply with the particular view, that private Greek companies lag in analytical resources and internal systems to support comprehensive/rational decision-making, extensive financial reporting and formalized procedures, or may be less interested in analysis.

In a study of decision-making practices between British and American-owned firms in Britain Mallory *et al.* (1983) reported that in general American ownership had little or no influence on the way decisions were made. Among the few alleged differences they found more reliance in British companies on certain aspects of formalization. The results of this study seem to reveal an important gap between private Greek enterprises and subsidiaries of multi-

nationals which tend to have international characteristics. This implies that Greek private management may be associated with less comprehensive/rational processes, less financial reporting, and less rule formalization. This opens up interesting questions on comparative decision-making practices across countries or types of firms, which may be a useful avenue for future research.

IMPLICATIONS AND POSSIBLE EXTENSIONS

Some interesting practical implications follow from the significance of decision-specific characteristics, identified in this research, in comparison to management, corporate environment, and internal firm characteristics. As certain of these decision-specific characteristics are amenable to managerial interpretation and perception it may be in the interest of management to actively manipulate the meaning or categorization of strategic issues, and through them to influence organizational responses. This is in line with much of the thinking in the area. For example, top management deliberately make certain decision-specific characteristics salient. It may choose to 'manipulate' the information provided from external to internal systems, such as 'Environmental Scanning' or 'Strategic Issue Management' or 'Boundary Spanning' systems, to serve its own goals. What may be communicated as a threat by a specific system may be characterized as an opportunity by another. Filtering information and manipulating decision-specific characterizations may enable management to subsequently control rationality, formalization, lateral communication, hierarchical decentralization, and even the extent of internal political activity.

The specific results indicate that certain management and internal firm characteristics bear on the strategic DMP, while others such as the environment variables appear to be insignificant. So contrary to allegations on the significance of environmental determinants, management seems to play an important role. More specifically, CEO's risk propensity, education, and tenure as well as the TMT's aggressiveness seem to be important determinants of certain process dimensions (e.g., rule formalization, financial reporting,

hierarchical decentralization, and lateral communication). These results directly question the findings of a number of research works arguing for the secondary role of managers.

Another implication of the results is that they verify the important role of the formality of planning systems in influencing the making of SDs. Results indicate that formal planning influences the way in which strategic decisions are taken and thus, to an extent, strategy itself. Indeed, by influencing comprehensiveness, lateral communication, and political activities, formal planning systems seem to act as a powerful input to the process of strategy making.

Corporate control is also important, suggesting an important lagging of private Greek firms in rationality. SOEs instead seem to be closer to international standards, as a benchmark against the subsidiaries of multinationals included in the sample.

The present research effort has touched on only a few of the research questions in the field of SD-making. Several extensions, both methodological and substantive, need to be made, and a number of points concerning overall research recommendations in the area highlighted.

First, the research has established the dominance of decision-specific characteristics over other management and context factors in making SDs. More work needs to be done to test the generalizability of the present results in other settings and sample designs. Another useful line of research would be to examine the same hypotheses in more narrowly defined samples, e.g., controlling for types of enterprises or SDs and for other context variables, so that consistent research findings can be accumulated and a more focused contingency theory on the impact of context on strategic DMPs developed.

Second, despite the fact that the regression models tested here appear to have a very good explanatory power over the adopted process dimensions, there still remains an unexplained percentage of variance. Further research can incorporate additional variables not considered in the course of this study (e.g., contextual elements such as reward systems, organizational structure, or further SD attributes), and may adopt different and possibly more appropriate operationalizations of the constructs already used.

Third, theory is needed that more accurately reflects the strategic DMP in its context and the

relative weight of its determinants. Progress in this area could significantly improve both our understanding and eventually the quality of strategic DMPs. A refinement of the formulation may be necessary before a more substantial explanation or prediction capability can be achieved.

Fourth, it may be useful to include intermediate outcome variables of SDs (e.g., innovation, learning, decision quality, satisfaction, commitment, and overall company performance/effectiveness). Future research may seriously consider these aspects, which were outside the scope of the present work.

Fifth, the present work has established the multidimensional aspects of SD processes and the multiple relationships with the main variables of the study. This enhances the need for producing a more integrated image of decision-making reality through the simultaneous study of a large number of qualities, and use of more sophisticated multivariate analysis of contextual influence on strategic DMPs (Rajagopalan *et al.*, 1993). Simultaneous equation techniques would be useful to further examine determinants of the actual sets of relationships in practice.

It will also be interesting to investigate how closely these results, obtained in one southern EU country, apply to SDs in the countries where the vast majority of research in this field has taken place (United States, United Kingdom, Canada).

Some of the empirical results from this study concur with the body of research evidence in the area. This would support the 'culture-free' argument which maintains that cultural differences may not affect relationships among structural characteristics (e.g., Negandhi, 1975). There are, however, certain findings which may be interpreted as 'culture specific'. For instance, the enhanced role of decision-specific characteristics as against corporate environment and top management may be specific to the particular context. It is possible that because Greek private firms have less formal rules and less comprehensive decision processes than their U.S. or British counterparts, they would be more likely to treat each SD as unique and thus react in a more 'emotional' manner. In U.S. or British firms with more formal rules and procedures for SDs, decision-specific characteristics may be less important and all or most SDs may be handled using similar processes. This does not mean

decision-specific characteristics are of no significance in such a context; the work of Dutton *et al.* (1989) as well as many others provide clear evidence to the contrary. It rather implies that the role of these characteristics may be not as dominant as they appear to be in the Greek context. This opens up a very promising avenue for future research on comparative decision-making practices, across different country and/or cultural domains. As Charles Schwenk argues in a recent literature review, 'it may be that many of the conclusions about strategic decision making developed in the U.S. context will have to be modified in order to be applicable across cultures' (Schwenk, 1995: 484).

ACKNOWLEDGEMENTS

The authors gratefully acknowledge that this paper has benefited from an EC Post Doctoral fellowship. They would like to thank three anonymous reviewers of SMJ for their comments and suggestions which helped improve this paper substantially.

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APPENDIX 1: METHODOLOGY OF DATA COLLECTION

The SDs were identified at the initial CEO interview. The CEO was asked to complete the first general questionnaire providing information about the company, its environment, and its organization. Then the CEO was asked to name the two most important investment decisions which had taken place in the last 2–3 years. In an attempt to minimize distortion and memory failure problems, he (all the CEOs were men) was asked for recent decisions. The vast majority of the decisions were taken less than 6 months prior to interview.

The CEO was asked to give a *brief description* of each decision and the process followed in making it, and to name *all the key participants* as well as the manager with the most intimate knowledge of the process, e.g., the project champion (this methodology follows that of Hickson *et al.*, 1986). In most cases we had access to the paper trail documenting the decision and its process, before interviewing the designated manager: investment decisions tend to be better documented than other strategic decisions (Marsh *et al.*, 1988). This aided understanding, helped to form a clearer picture of the process, and also helped in checking managers for possible memory failure and ex post rationalization (Huber and Power, 1985).

Semistructured interviews were conducted with the most knowledgeable manager (Huber and Power, 1985). We followed a 'funnel sequence' whereby the interview started with a semistructured discussion using open-ended questions (Bouchard, 1976). This approach was preferred for the following reasons:

1. It helped the manager to *conceptually reconstruct* the whole process and its major stages, before answering the more specific (closed-ended) questions which followed.
2. It provided *detailed qualitative data* on the level of respondent's understanding, his/her conceptual language, personal views, etc.
3. By answering spontaneously the initial open-ended questions, the respondent has committed himself to a certain 'reality' concerning the making of the decision and thus it was easier for the researcher to *check the validity of responses* in the closed-ended questions that followed.

When this informal discussion was completed interviewees were handed the second decision-specific questionnaire designed to measure the dimensions of the process. Their responses were always checked against the initial CEO interview and the paper trail. If the answers differed from what these sources suggested, we were able to question the manager's recollections. A thorough discussion followed and the manager usually justified his/her point of view.

Where interviewees felt they had insufficient information (e.g., a production manager could not reliably recall aspects of the financial evaluation or the marketing issues), we conducted further interviews with the relevant informants (e.g., finance or marketing director) to *clarify these specific points. Their responses in these specific points were used as better approximating reality.* These incidents were rare because people selected had actively participated in the process and thus had a thorough understanding of what actually happened. Six decisions out of 70 used this hybrid multiple-informant approach.

SD-making process dimensions	Operationalization	Variables derived from:	Items in scale	Alpha
1. Rationality/comprehensiveness	<p>This construct is based on Fredrickson's (1984) rationality/comprehensiveness dimension. Five stages in the SD process 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's eight rationality elements are measured on 5-point Likert-type scales (i.e., extent of scheduled meetings, assignment of primary responsibility, information-seeking activities, systematic use of external sources, employees involved, use of specialized consultants, years of historical data review, and functional expertise of people involved). The rationality elements for each stage are summed to create five additive variables, each representing the rationality/comprehensiveness dimension of the respective stage. Summation of these five variables results in an overall measure of rationality-comprehensiveness of the process.</p>	Fredrickson (1984)	5	0.94
2. Financial reporting	<p>This is one of the two factors extracted from a factor analysis investigation involving 16 items measuring the degree of reporting activities in support of the SD. This specific factor variable measures the degree of financial reporting activities and consists of six items. Sample items include: (1) use of NPV-IRR methods, (2) inclusion of pro forma financial statements, (3) detailed cost studies, (4) incorporation of the SD into company-wide financial plans. The measurement scale ranges from '1' absolutely false to '7' absolutely true.</p>	<p>Ideas expressed by: King (1975) Marsh <i>et al.</i> (1988) Stein (1980)</p>	6	0.90
3. Rule formalization	<p>This construct is one of the three factors extracted from a factor analysis investigation involving 17 items measuring the degree of formalization/standardization of the process. This specific factor variable incorporates seven items and measures the degree of rule formalization during the making of the SD.</p>	<p>Ideas expressed by: King (1975) Stein (1980)</p>	7	0.89

	Sample items include: the degree 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 SD evaluation. The measurement scale ranges from '1' absolutely false to '7' absolutely true.			
4. Hierarchical decentralization	This additive variable measures the extent of vertical decentralization of the decision-making during all the phases of the process. It is based on the total amount of participation of various hierarchical levels and departments in each of the previously mentioned five phases of the process. The five hierarchical levels include owner-main shareholder, CEO, first-level directors, middle management and lower management. Responses are taken on a 5-point Likert-type scale, anchored with '1' no involvement at this stage to '5' active involvement and influence. By adding all hierarchical layers for every stage in the process, five additive variables were obtained, each measuring the hierarchical decentralization in the respective stage. Summing all five variables resulted in an overall measure of hierarchical decentralization.	Ideas expressed by: Tannenbaum (1968) Grinyer <i>et al.</i> (1986)	5	0.93
5. Lateral communication	Lateral communication was measured in a similar way to hierarchical decentralization, except that it measures the degree of balanced participation of all major departments in the adopted five stages of the process. The major departments include: finance-accounting, production, marketing-sales, personnel, and purchasing department.	Ideas expressed by: Tannenbaum (1968)	5	0.87
6. Politicization	This variable results from the addition of four 7-point Likert-type scales measuring the extent of coalition formation, the degree of negotiation taking place among major participants, the degree of external resistance encountered and finally the degree of process interruptions experienced. Scales range from '1' absolutely false to '7' absolutely true.	Pettigrew (1973) Mintzberg <i>et al.</i> (1976) Hickson <i>et al.</i> (1986)	4	0.77

7. Problem-solving dissension	Three items comprise this variable measuring the degree of problem-solving dissension during the initial stages of the process: the degree of disagreement on '1' the objectives sought by the decision, '2' the proper methodology to follow and '3' the proper solution to the problem.	Eisenhardt and Bourgeois (1988) Butler <i>et al.</i> (1991)	3	0.71
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APPENDIX 3: OPERATIONALIZATION OF DECISION-SPECIFIC, MANAGEMENT, AND CONTEXTUAL VARIABLES

Generic decision-specific characteristics	Operationalization	Variables derived from:	Items in scale	Alpha
1. Magnitude of impact	Composite variable consisting of eight 5-point Likert-type scales measuring the impact of SD on the following organizational areas: (1) profit, (2) quality of products/services, (3) total production, (4) cost, (5) sales, (6) market share, (7) call for changes in existing programs and (8) organizational adjustment required to serve the decision.	Ideas drawn from: Beach and Mitchell (1978) Schneider and De Meyer (1991)	8	0.81
2. Threat/crisis	Composite variable consisted of two scales measuring the extent to which the SD is perceived as a crisis situation and the second the threat of financial loss.	Billings <i>et al.</i> (1980)	2	0.68
3. Decision uncertainty	Composite variable consisting of three 7-point Likert-type scales measuring the uncertainty about actions to be taken, general uncertainty surrounding the decision, and uncertainty concerning the information to be collected.	Beach and Mitchell (1978)	3	0.56
4. Frequency/familiarity	Composite variable consisted of two scales measuring the frequency of occurrence, the familiarity of the SD to the company, and the extent to which the SD was part of another major decision.	Dutton <i>et al.</i> (1989) Beach and Mitchell (1978)	3	0.54
5. Pressure	Extent of pressure exerted either on the organization or the time pressure felt by the participants in the SD.	Beach and Mitchell (1978) Schneider and De Meyer (1991) Billings <i>et al.</i> (1980)	2	0.70

6. Planned vs. ad hoc	A 5-point Likert-type variable measuring the extent to which the SD emerged through some type of formal planning effort.	Sinha (1990)	1	-
Top management characteristics	Operationalization	Variables derived from:	Items in scale	Alpha
1. CEO's need for achievement	Composite variable consisted of six 7-point Likert-type scales measuring an active attitude towards decision-making and personal goal setting.	Steers and Braunstein (1976) Eysenck and Wilson (1975)	6	0.70
2. CEO's risk propensity	Composite variable consisted of 15 5-point Likert-type scales measuring the psychological disposition of the CEO towards risk. Particular care was exercised to select items approximating the reality of business situations and represent 'monetary risk'.	From Jackson's Personality Inventory (3 out of 8 items) and Eysenck and Wilson's Risk Propensity scale (1975)	15	0.73
3. CEO's number of years with the company	Continuous variable measuring the number of years the CEO is with the company.	Ideas drawn from: Hambrick and Mason (1984) Fredrickson and Iaquineto (1989)	1	-
4. CEO's level of education	One 5-point scale measuring CEO's level of education.	Ideas drawn from: Hambrick and Mason (1984) Haley and Stumpf (1989)	1	-
5. Top management's aggressive philosophy	Here the CEO was asked to rate the aggressive philosophy of his TMT on three dimensions (attitude of the whole top management team towards innovations, risky projects, and competitors).	Adapted from Khandwala (1977)	3	0.70
6. Top management team's level of education	Percentage of managers, down to the level of departmental heads who are university graduates.		1	-

External corporate environment	Operationalization	Variables derived from:	Items in scale	Alpha
1. Environmental heterogeneity	Composite variable consisting of four 5-point Likert-type scales measuring significant differences between the products/services offered in relation to: (1) customer's buying habits, (2) the nature of competition, (3) market dynamism, (4) market uncertainty.	Miller and Friesen (1983)	4	0.86
2. Environmental dynamism	Composite variable consisting of eight distinct scales referring to three derived subconstructs: (1) dynamism in marketing practices, (2) competitor dynamism and (3) customer dynamism. Each scale was measured in a 7-point Likert-type scale ranging from '1' (no change) to '7' (very frequent changes).	Achrol and Stern (1988)	8	0.81
3. Environmental munificence–hostility	Composite variable consisting of three 5-point Likert-type scales measuring the degree of environmental (1) riskiness, (2) stressfulness, (3) dominance over the company.	Khandwalla (1977)	3	0.69
Internal firm characteristics		Variables derived from:	Items in scale	Alpha
1. Planning formality	Composite variable consisting of seven 5-point scales ranging from '1' strongly disagree to '5' strongly agree. The scales measure the extent of: (1) formal functional area planning, (2) active departmental participation, (3) formulation of quantified goals, (4) formalization of company objectives, (5) existence of planning group or department, (6) development of a favorable planning climate, and (7) existence of detailed action plans.	Adapted from Wood and Lalforge (1981)	7	0.89

Corporate performance	Operationalization	Variables derived from:	Items in scale	Alpha
1. Return on assets	Return on assets (ROA) averaged for 5 years, to decrease to chance of a 1-year aberration influencing results. Another consideration was to control for industry effects on performance. Since three different industrial sectors are represented in the sample each of the resulting ROA measures was divided by the mean ROA of the respective sector, in an attempt to control for sectoral influences.	Bourgeois (1980)	-	-
2. 'Growth' in profits	Percentage change in 'growth' in profits over a 5-year period.	Fredrickson (1984)	-	-

All composite variables were averaged by the number of scale items in the construct.

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