

**Executive Characteristics, Strategic Orientation and Organizational Performance;
A Study of Relationships in the U.S. Electronic Computing Equipment Industry**

by

Anisya Susan Thomas

Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of
Doctor of Philosophy
in
Management

APPROVED:

~~Dr. Robert J. Litschert, Chairman~~

~~Dr. Larry D. Alexander~~

~~Dr. Thirwall W. Bonham~~

~~Dr. Rajaram Veliyath~~

~~Dr. Richard E. Wokutch~~

November 28, 1989

Blacksburg, Virginia

**Executive Characteristics, Strategic Orientation and Organizational Performance;
A Study of Relationships in the U.S. Electronic Computing Equipment Industry**

by

Anisya Susan Thomas

Dr. Robert J. Litschert, Chairman

Management

(ABSTRACT)

The primary goal of this study was to develop a theoretically based, parsimonious framework for the examination of the relationships between executive characteristics, strategy and performance. In order to achieve this goal, prior literature examining the linkages between executive characteristics and strategy and executive characteristics and performance was integrated to derive two broad theoretical propositions.

The first proposition stated that different managerial profiles would be associated with different strategic postures. The rationale for this proposition was derived from previous empirical and theoretical evidence which suggests that since different strategies emphasize different organizational competences, they can be best implemented by managers who have skills compatible with these competences. Building on this logic, the second proposition suggested that a fit between managerial profiles and organizational strategy would enhance performance. This proposition stems from the behavioral literature which argues that the characteristics of managers influence their perception of the environment and consequently their decision-making. Thus, if managerial decisions are not compatible with the strategy and consequently the competences of the organization, performance will suffer.

In order to test these propositions each of the three constructs were operationalized in a multidimensional manner. Strategy was conceptualized in terms of the Miles & Snow (1978) typology which delineates comprehensive and internally consistent postures of organizational behavior encompassing their structures and processes. The executive characteristics construct was operationalized through five demographic dimensions each of which had been found significant in previous research. Finally, performance was operationalized to include the separate market based and efficiency goals of the different strategies.

The data used to perform the empirical test were obtained from objective, secondary sources to control for the effects of perceptual bias which plagues researchers who use self-report data. The measures of strategic orientation and performance were standardized through the use of ratios to limit the unwanted variation introduced by differences in organizational size. The research site was restricted to a single industry containing relatively homogeneous firms, to control for spurious results that can occur due to the different environmental factors that operate in different industries.

The manuscript includes detailed descriptions of the theoretical literature from which the research was conceived, the results obtained and the conclusions derived. The primary contributions of this study were the integration of two distinct research streams, and the development of a broadly applicable model which is a useful platform for the future study of strategic leadership.

Acknowledgements

This dissertation is the final step in the most challenging journey that I have embarked upon. The voyage has been an exciting and fulfilling experience that has contributed immensely to my personal growth. While there have been periods of failure and loneliness, the memories that I will carry with me are joyful ones.

Perhaps, the most significant aspect of the odyssey are people I have encountered. Without the encouragement, support and friendship of my committee, my friends and my family this passage would never have been achieved. It is to these people that I dedicate my dissertation.

I am indebted to Dr. Robert J. Litschert, my chairman and my mentor, who believed in me when I did not believe in myself. Dr. Litschert has been the perfect chairman who has patiently encouraged and inspired me. From him I learned the love of strategic management and the challenge of discovery through research.

The support that Dr. Bonham provides to doctoral students in the college of business is legendary. I will always be grateful for the time and effort that he invested in my work and for his sense of humor which could be counted on to perk me up at my lowest points.

My earliest training in strategic management was received from Dr. Larry D. Alexander from whom I learned the value of careful research and attention to detail. He also introduced me to the responsibility that a professional academic owes to the community of colleagues and students with whom she interacts.

I have enjoyed working with and learning from Dr. Richard E. Wokutch and Dr. Rajaram Veliyath who spent many hours talking with me and advising me about the professional arena that I am about to enter. I am grateful to each of these people for their encouragement and friendship.

I am also thankful to Dr. Jerald F. Robinson and Dr. Martin Schnitzer. As the Doctoral Program Director, Dr. Robinson went far beyond the call of duty to make my first years here pleasant and productive. Dr. Schnitzer, was a significant influence in my choice of a minor area. In his capacity as my advisor in international business, he spent a great deal of time revealing to me the intricacies and challenges of doing business in a growing and changing world.

I take pride in the friendship that has developed with the members of my committee and the other faculty with whom I have interacted at Virginia Tech. I know that my association with them has not ended and look forward to continuing these relationships as a colleague who can justify the time they have invested in me.

During these past years I have forged a bond with four special people whose friendship I will cherish all my life. _____ has always been there to listen when I needed to

talk. The countless hours I spent with _____ / my friend and coauthor, _____ have contributed immeasurably to my personal and professional growth.

_____ who represents an ideal colleague, generously gave many hours of his precious time to

make the process of data collection and analysis significantly easier. brought to our group a unique perspective on life and the universe. The five of us have grown, matured and learned together despite our diverse backgrounds and goals. Without my friends this program could not have provided me the fulfilment that it has.

I cannot find the words to thank and acknowledge the unconditional love and support of my family. My parents and taught me the value of hard work and to believe that I was capable of conquering the world. The love of my brothers and motivated me to accept new challenges. Last, but certainly not least, my fiance has been a constant support and inspiration. During the last five years he has been involved with every aspect of my work and has sacrificed a great deal for me. By making my dream ours, he has given to me more than any other person in the world. For this I will forever be grateful.

The end of this dissertation marks the beginning of a new and uncharted journey to an unknown destination. However, the lessons that I have learned and the training I have received at Virginia Tech gives me the confidence to face this challenge.

Table of Contents

Chapter I: Introduction and Objectives	1
Introduction	1
The Study of Executive Characteristics	2
The Importance of Leaders	4
Relationships and Linkages	5
Executive Characteristics and Strategy	6
Strategy and Performance	10
Executive Characteristics and Performance	11
Research Model	11
Framework for the Study	14
Research Objectives	14
Constructs and Operationalizations	15
Research Hypotheses	16
Methodological Considerations	17
Summary and Review of Subsequent Chapters	18
Chapter II: Literature Review	19
Introduction	19
Two Research Streams	20
Executive Characteristics and Strategy	20
Executive Characteristics and Performance	26
Evaluation of the Research Streams	27
Operationalizing the Model	29
Strategic Orientation	30
Executive Characteristics	33

Performance 39

Summary 39

Chapter III: Research Methodology 40

Introduction 40

Research Setting 40

 Data Collection Method 42

 Population 45

Operationalization of Constructs 45

 Strategic Orientation 45

 Executive Characteristics 47

 Performance 50

 Control Variables 52

 Determining Strategic Orientation 52

Hypothesis Testing 53

 Hypothesis 1 53

 Hypothesis 2 55

Summary 57

Chapter IV: Data Analysis and Results 58

Introduction 58

Data Collection 58

 Firm Data 58

 Executive Data 59

 Identifying the Population 59

Describing the Data 61

Measurement and Control 65

 Precision and Reliability 65

Validity	66
Determining Strategic Orientation	75
Validating the Typing of Firms	76
Refinement of the CEO Characteristics Construct	80
Test of Hypothesis 1	82
Test of Hypothesis 2	95
Development of "ideal-type" CEO profiles	95
Defining the Fit	96
Measuring Performance	97
Testing the Fit	97
Summary	102
Chapter V: Discussion and Conclusions	105
Introduction	105
Hypothesis 1	106
The CEO-Strategy Match - An Example	107
Hypothesis 2	111
Contributions and Limitations of the Study	113
Theoretical Contributions and Limitations	113
Methodological Contributions and Limitations	117
Suggestions For Future Research	119
Theoretical Issues	119
Methodological Issues	121
Conclusion	122
Bibliography	123
Appendix A. Demographic Profile Questionnaire	133

Appendix B. List of Firms 136

Chapter I: Introduction and Objectives

Introduction

The strategic choice perspective (Child, 1972), a major paradigm in strategic management, postulates that key decision makers (or top executives) have considerable control over an organization's future direction. According to this view, control is exerted through choices of product market domains, technology, size, structure, etc. Pursuant to this logic, several researchers have attempted to conceptualize and test the nature and form of executive influence on organizational outcomes (Hambrick & Mason, 1984; Leontiades, 1982; Norborn, 1986; Norborn & Birley, 1988; Osborn, Martin & Glueck, 1981). Despite the growing amount of literature on this topic, many studies have limited their examinations to the consideration of simple bivariate relationships. While some researchers study the association between managerial characteristics and strategic orientation (Chaganti & Sambharya, 1987; Channon, 1979; Song, 1982), others examine the linkages between these characteristics and performance (Child, 1974; Norburn and Birley, 1988; Virnay & Tushman, 1986). This research effort suggests that both these conceptualizations are partial explanations of a larger phenomenon that incorporates the impact of executive characteristics and strategy on organizational performance.

The following study attempts to integrate diverse research findings to develop a middle-range contingency model of the linkages between top management characteristics, strategy and organizational performance. Specifically, it is suggested that it is the "fit" between the characteristics of top managers, and the strategic orientation of firms that has an influence on organizational performance.

The Study of Executive Characteristics

The study of the impact of upper echelon managers on organizational strategy and performance is a relatively new and underdeveloped field of inquiry. The primary reason for this underdeveloped state is prior research evidence indicating that managers had a minimal role in determining organizational outcomes. However, a careful scrutiny of previous studies, and an aggregation of recent research results provide evidence to the contrary. In this section, the literature pertaining to both views is presented and an argument justifying the importance of this field is developed.

The proponents of the view that the leaders of an organization are irrelevant to its success include Hall (1977), who suggests that a leader is important to a firm only in times of organizational growth, development and crisis. He asserts that for the most part, organizations simply require maintenance, and have systems in place to perform the necessary functions, thus making the leader a symbolic figurehead. The two classic studies that have been cited most often to support this view are the ones by Lieberman and O'Connor (1972) and Salancik and Pfeffer (1977). Day and Lord (1988) state that the combined impact of these studies has been the main factor in inhibiting research examining leadership influences. These studies are reviewed below.

Lieberson and O'Connor (1972) attempted to apportion the variance of three dimensions of corporate performance to environmental, corporate and leadership influences for 167 corporations over a 20 year period. The performance dimensions studied were profits, sales and profit margins. Environmental influences were represented by year (intended to capture economic conditions) and industry (intended to reflect the environmental influence). The leadership measure reflected all the activities that took place during the term of a Chief Executive Officer (CEO). Using a decomposition of variance methodology, the authors sequentially apportioned corporate performance variance to year, industry, company and stewardship, in that order. The variance of the performance measures associated with company ranged from 23% to 63%; that associated with industry was 19% to 29% and leadership 2% to 3%. Therefore, the authors concluded that leadership was irrelevant to an organizations success.

Salancik and Pfeffer's (1977) study examined the influence of mayors on two income and eight expenditure variables. This study also incorporated a longitudinal design encompassing 18 years of data for thirty cities. Their results indicated that variance in budget items was most influenced by city (55% to 91%), next by year (3% to 17%) and then by leadership (7% to 15%).

Based on this evidence, it was concluded that the leaders of an organization had a minimal impact on its success, and further research into the phenomena was discouraged. However, a re-analysis of the data from both studies revealed interesting results. These results, combined with other conceptual and empirical efforts (Day & Lord, 1988; Hambrick & Mason, 1984) have prompted a resurgence of interest in the field, and a move to develop theories explaining the extent and form of leadership influences on organizational outcomes.

The Importance of Leaders

In a replication of the Lieberson and O'Connor study, Weiner (1978) showed that the methodology employed by the authors capitalized on the order effect. She used a different sample of organizations and the same variance methodology and found essentially similar results. Stewardship (leadership) accounted for only 9% to 19% of the variance of different measures of performance. To assess the potential order effect Weiner then apportioned performance variance first to stewardship, then to year, industry and corporation. In this analysis stewardship accounted for 75% to 95% of performance variance. Year accounted for very little (2% to 3%) even when it was apportioned first; therefore, assessing stewardship variance first appears to result in attribution to leadership of variance due to unspecified organizational characteristics. Variance originally attributed to industry was also attributed to stewardship when performance variance was first apportioned to stewardship. Therefore even the 19% to 29% of environmental influence that Lieberson and O'Connor attributed to industry may in fact reflect corporate factors such as size etc., that vary by industry. Finally, the original study employed a combination of dependent variables that made it almost impossible for the leadership variable to take a major role. For example, two of the three dependent variables - dollar sales and earnings, are primarily indicators of the firm's size and industry it is in. The third variable return on sales also carries a large industry specific component (as returns vary widely by industry) and therefore is not a good measure.

Weiner and Mahoney (1981) attempted to overcome these problems in another replication of the Lieberson and O'Connor study. They used profit level, profitability, and stock prices as performance measures and GNP and industry concentration ratios to measure the environment. Leadership was measured as the firm's performance during

a particular leader's tenure lagged two and five years. The results obtained from this study indicated that 44% of the variance in profitability, 12.8% of the variance in profits and 47% of the variance in stock prices was accounted for by stewardship. Similarly, Day and Lord (1988) point out that Salancik and Pfeffer's (1977) results were misleading, due to the large, but theoretically meaningless contribution of city size. When the budget variables were computed as proportions of total city budget, to control for size effects, the stewardship effects were over 24%.

Although the above review indicates to the importance of leaders in the determination of organizational outcomes, the investigations of this issue have proceeded primarily on a methodological level. No study has attempted to theoretically explain the process by which leaders affect organizational outcomes and the source and extent of their influence. This research effort proposes to address these questions by integrating two distinct streams of inquiry. In the following sections, the key relationships and linkages explored in this study are introduced.

Relationships and Linkages

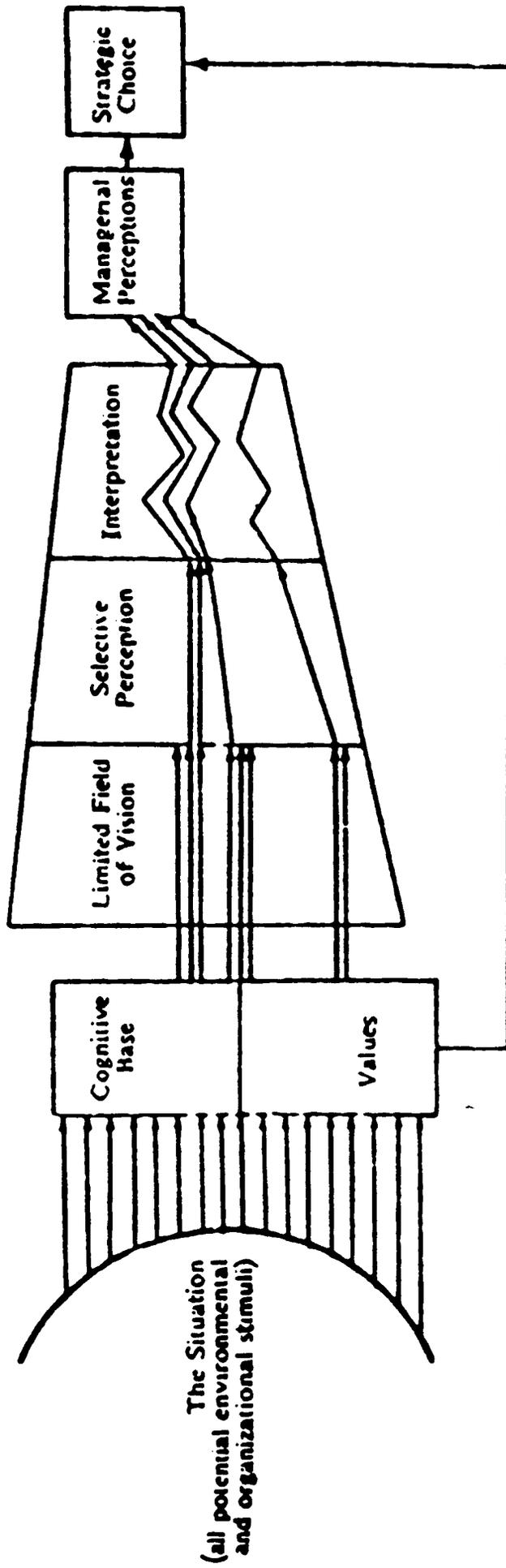
This section briefly introduces the theoretical underpinnings of research examining the relationships between (a) executive characteristics and strategy (b) strategy and performance and (c) executive characteristics and performance, to set the stage for the discussion of the contingency model. Each of these linkages will be more thoroughly examined in chapter II.

Executive Characteristics and Strategy

In a classic paper Hambrick and Mason (1984) developed a model based on the research of the behavioral theorists (Cyert & March, 1963; March & Simon, 1958) to explain the link between executive characteristics and strategy. They described the process of strategic choice as a perceptual one that occurs in a series of sequential steps.

“First, a manager or even an entire team of managers cannot scan every aspect of the organization and its environment. The manager’s field of vision, -- those areas to which attention is directed -- is restricted, posing a sharp limitation on eventual perceptions. Second, the manager’s perceptions are further limited because one selectively perceives only some of the phenomena included in the field of vision. Finally, the bits of information selected for perception are interpreted through a filter woven by one’s cognitive base and values. The manager’s eventual perception of the situation combines with his or her values to form the basis for strategic choice”. (Hambrick & Mason, 1984, p. 195)

This model which is shown in Figure 1.1 suggests that the choices made by managers on behalf of the organization reflect to some extent, the characteristics of these managers. Thus, it can be argued that when confronted with the same objective environment, different managers will make different decisions based on their individual experiences and values. Therefore, the critical role of top managers in strategy formulation and the determination of the strategic direction of the organization becomes apparent.



Source: Hambrick and Mason (1984).

Figure 1.1
Strategic Choice Under Conditions of Bounded Rationality

Normative theorists have developed similar arguments to demonstrate the importance of top managers in strategy implementation. These are best illustrated through the examination of typologies of strategy or generic strategies that occupy a central position in the current strategic management literature. Several strategic typologies (Hofer & Davoust, 1977; Kerr, 1982; Leontiades, 1982; Miles & Snow, 1978; Porter, 1980; Wissema, Van der Pol & Messer, 1980), advocate that leaders with different attributes and skills are necessary to successfully carry out and administer the various strategies. For example, Wissema, Van der Pol and Messer (1980) suggest that an organization pursuing an expansion strategy, which involves the improvement of the firm's competitive position over the long run, would require its leader to be a 'conqueror'. Similarly, Leontiades suggests that an organization in the evolutionary stage (of the organizational lifecycle), requiring growth and investment in different markets would best be led by a 'remote controller, aloof strategist, acquiror, and growth director'.

Thus the normative studies seem to indicate that organizations pursuing different strategies would as a matter of course have leaders with different characteristics and skills. The empirical literature to date however provides only limited support this conclusion. There could be several reasons for this. First, testing and integrating these models is very difficult due to the ambiguity of terms such as 'conqueror' and 'growth director' (Gupta, 1984; Szilayagi & Schweiger, 1984). Second, the meaning of strategy is taken for granted in most of the models - rarely elucidated - making comparisons even more difficult. Third, the terms that describe the requisite managerial characteristics associated with each strategy, imply a multiplicity of dimensions which are never explained, making it impossible to perform a valid test. Table 1A summarizes several typologies, associated models, descriptions of the job requirements for each strategy, and the managerial characteristics required for successful implementation of the same.

Table 1A
Summary of Selected Strategy-Manager Matching Models

Model	Strategies	Job Requirements	Mgr'l. Char.
Wissema, Van Der Pol, Messer (1980) (Archetypes)	<ol style="list-style-type: none"> 1. Explosive 2. Expansion 3. Continuous Growth 4. Slip 5. Consolidation 6. Contraction 	<ol style="list-style-type: none"> 1. Improve competitive position in short period 2. Improve competitive position over long term 3. Maintenance activities 4. Cost reduction 5. Dexterity, flexibility and artistry 6. Various 	<ol style="list-style-type: none"> 1. Pioneer 2. Conqueror 3. Level-headed ruler 4. Administrator 5. Economizer 6. Insistent Diplomat
Leontiades (1982) (Stages of Growth)	<ol style="list-style-type: none"> 1. Steady-state 2. Evolutionary 	<ol style="list-style-type: none"> 1. Efficiency based on SBU 2. Growth, investment in other areas/markets 	<ol style="list-style-type: none"> 1. Activist, growth entrepreneur, product manager, R&D planner 2. Remote controller, aloof strategist, acquiror, growth director
Kerr (1982) (Reward System)	Introduction, growth, maturity, decline as applied to homogeneous firm	Reward system that focuses on critical job responsibilities (i.e. performance criteria)	Model advocates eliciting desired managerial behaviors through the use of reward systems.
Miles and Snow (1978)	<ol style="list-style-type: none"> 1. Defender 2. Prospector 3. Analyzer 4. Reactor 	<ol style="list-style-type: none"> 1. Domain protection, efficient production, strong control emphasis 2. Locate and exploit new opportunities, technological flexibility, coordination of needs 3. Combination of above 4. Variable 	<ol style="list-style-type: none"> 1. Finance and or Production expertise in dominant coalition 2. Marketing and or R&D expertise in dominant coalition 3. Combination of above 4. Variable
Porter (1980) (Generic strategies)	<ol style="list-style-type: none"> 1. Overall cost leadership 2. Differentiation 3. Focus 	<ol style="list-style-type: none"> 1. Tight cost control, frequent reports, strict rules, incentive based targets, access to capital. 2. Coordination focus, incentives based on quantitative targets. 3. Combination of above 	<ol style="list-style-type: none"> 1. Process engineering skills, task orientation skills (inferred) 2. Coordination skills, product engineering skills, marketing knowledge creative abilities (inferred) 3. Combination of above
"Wanted a Manager" (1980) Also Tichy et al (1982)	SBU level only <ol style="list-style-type: none"> 1. Grow 2. Defend 3. Harvest 		<ol style="list-style-type: none"> 1. Growers 2. Caretakers 3. Undertakers
Hofer and Davoust (1977)	SBU level only <ol style="list-style-type: none"> 1. Invest/Grow 2. Earn/Protect 3. Harvest/Divest 		<ol style="list-style-type: none"> 1. Mature entrepreneur, planner entrepreneur, turnaround entrepreneur 2. Sophisticated planner, profit planner, turnaround specialist 3. Professional manager, experienced cost cutter, professional liquidator

Source: Adapted from Szilagyi & Schweiger (1984) and Gupta and Govindrajana (1985).

These shortcomings are overcome in the typology presented by Miles and Snow (1978) who suggest that a firm can pursue three distinct types of strategic postures namely that of a Prospector, Analyzer or Defender. According to these authors, adhering to any one of these strategic types would make the firm successful in the long run. The authors also describe in detail the types of managerial skills associated with the successful pursuance of each strategy and the logical reasons for the same.

Therefore, in this research effort the Miles and Snow (1978) typology of strategic types was used as the primary framework to test for the linkage between executive characteristics and strategy. The reasons for this decision are presented in greater detail in chapters II and III.

Strategy and Performance

The very premise or foundation upon which strategic management rests is that a well articulated and implemented strategy that details mechanisms to deal with external influences using the internal strengths of an organization positively influences performance. On the other hand, a poorly planned strategy can have a serious negative impact on performance (Lawrence & Lorsch, 1967; Child, 1972; Ansoff, 1965). Thus, the purpose of strategic management research is to determine the conditions under which some strategies are successful and others unsuccessful - or in other words - to examine the determinants, antecedents and consequences of strategy. Therefore, based on the existing literature, it is possible to state that strategy formulation and implementation influences firm performance.

Executive Characteristics and Performance

The studies that have examined executive characteristics and performance, for the most part, have done so without the consideration of strategy. For example, Hambrick and D'Aveni (1985) used a matched-pair design to compare the characteristics of the Top Management Teams (TMT's) of 60 large U.S companies which experienced bankruptcy within the period 1970-82, to that of financially successful companies within the same industry classification. The TMT's of bankrupt companies showed a greater preponderance of throughput functional experience (e.g. production, process engineering, accounting) than output functions (e.g. marketing, sales R&D), shorter tenure, fewer technical degrees, more MBA's and fewer outside directors. In a similar effort, Child (1974) found that firms run by younger managers experienced faster growth rates.

The above review indicates that prior examinations of this relationship have been relatively theory free. Researchers have proceeded with their investigations on the assumption that TMT characteristics have an independent and direct impact on organizational performance. However, explanations as to the process by which this influence is exerted, have thus far been largely lacking. The research model presented in the next section attempts to provide a theoretical foundation for the examination of the relationships between executive characteristics, strategy and performance.

Research Model

The preceding discussion briefly evaluated the theoretical arguments pertaining to the relationships among executive characteristics, strategy and performance. Within the

context of the strategic management paradigm, it was suggested that the characteristics of top managers influence the strategic direction of organizations. Drawing from the research of the normative theorists it was argued that since different strategies have distinct organizational requirements, they would be best implemented by managers with different profiles. Since strategy formulation and implementation have been found to directly influence performance, it can be argued that a "fit" or a match between managerial characteristics and organizational strategy, has performance implications.

This model which is presented in Figure 1.2 combines the separate bivariate linkages (examined earlier) to develop a comprehensive theoretical platform for the exploration of the process by which managers influence performance. By conceptualizing fit as the criterion variable, the model allows for the simultaneous examination of executive characteristics and strategy on performance.

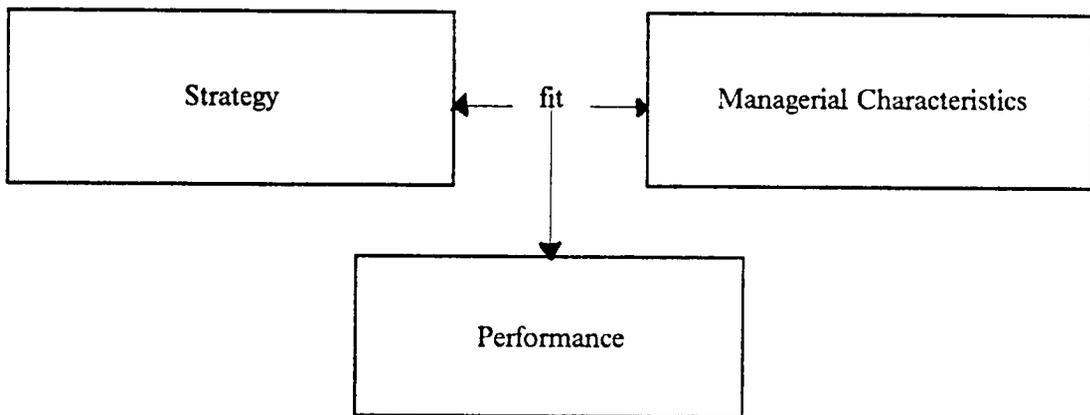


Figure 1.2
The Research Model

Framework for the Study

In this section, the research objectives, constructs, operationalization of the constructs, hypotheses and methodological decisions will be briefly highlighted. Detailed justifications for each will be presented in chapters II and III.

Research Objectives

The primary focus of this study is to integrate the research findings on the link between executive characteristics, strategy and performance to develop and test a tripartite model encompassing previously conceptualized bivariate relationships. Within the framework of the Miles and Snow (1978) typology, the following objectives will be sought.

1. To develop and test a middle-range contingency model examining the impact of executive characteristics.
2. To extend the relevance of the upper-echelon perspective to the strategic management paradigm through the incorporation of organizational performance as the dependent variable.
3. To test Miles and Snow's strategic typology and the hypothesized relationships between types of strategies and the specified dimensions of executive characteristics.

4. To determine if the fit between executive characteristics and strategy has performance implications.

Constructs and Operationalizations

The three constructs depicted in the research model are strategic orientation, executive characteristics and performance. This section briefly introduces the intended conceptualization and operationalization of these constructs.

Strategic Orientation: Strategy is a stream of decisions and choices that leaders or managers make on behalf of the organization, in order for the organization to achieve its goals and objectives (Miles & Snow, 1977; Mintzberg, 1978). Researchers have proposed that due to the various types of choices that are made, firms in any industry context can differ along more dimensions than merely market share or size (Schendel & Patton, 1978; Hatten & Schendel, 1977). In order to provide a framework for the study of differences among firms, several theorists such as Miles and Snow (1978), have suggested that there exist a limited set of strategic types or *gestalts*, which represent cohesive sets of decision patterns. Each of these strategic types encompass specific patterns of strategy, structure and processes that are linked to provide a coherent posture that enable firms to compete successfully.

For the purposes of this study, strategic orientation will be conceptualized in the context of Miles and Snow's (1978) typology of Prospectors, Defenders and Analyzers. This construct will be operationalized through the use of multiple measures to capture the distinct dimensions of the typology.

Executive Characteristics: In conceptualizing the executive characteristics construct, attention will be directed toward those demographic characteristics found significant in previous studies. This process will enable the development of a multidimensional profile of executives. Further, attempts to link each dimension of this construct to the different types of strategy will also be made. This construct will be operationalized through demographic indicators found to be relevant in previous research efforts.

Performance: Organizational performance will be conceptualized to incorporate the distinct goals of the three strategic postures. Therefore, the operationalization of this construct will include both market based and financial measures.

Research Hypotheses

This section will briefly introduce the research hypotheses. Each hypothesis will be theoretically justified and operationally stated in chapters II and III.

Based on existing theory, it is believed that (a) Prospectors, Defenders, and Analyzers can be found in each industry, (b) that each of these strategies when well implemented will perform equally well and (c) that the performance levels of those firms that achieve a match between executive characteristics and strategic orientation will be higher than for those firms that do not achieve such a match. Based on the above discussions and theoretical frameworks the following general hypotheses can be made:

Hypothesis 1: CEO's of firms pursuing Prospector strategies will have significantly different demographic profiles from the CEO's of firms pursuing Defender strategies.

In a broader sense, the test of this hypothesis will shed light on the managerial characteristics associated with different strategies. In this way it will contribute toward a better understanding of the components that comprise a particular strategic posture. This hypothesis will be operationalized in the context of Miles and Snow's (1978) framework of strategic orientation, thus providing a direct test of their contentions regarding the relationship between managerial characteristics and strategy.

Hypothesis 2: Organizations that achieve a match between their strategic orientations and CEO profiles will perform better than all other organizations with the same strategic orientation.

Hypothesis 2, is a direct test of the model presented earlier. Based on existing theoretical and empirical evidence it is believed that a match or fit between executive characteristics and strategy will contribute toward better organizational performance.

Methodological Considerations

The electronic computing equipment industry has been selected as the research site for this study. This large and growing industry exhibits a good mix of different competitive behaviors. Due to the high rates of obsolescence and innovation in the industry, new niches are constantly being carved, while firms unable to adapt - decline and go bankrupt. Thus it is expected that different strategic postures and varying levels of performance will be found, providing an ideal setting for the study.

The use of a single industry equates with the level of aggregation used in developing and extending the typology (Miles & Snow, 1978; Snow & Hrebiniak, 1980). It also 'assures

some comparability of technology, life cycle of the product category, general level of capital intensity and so on' (Hambrick, 1984).

Data for this study will be obtained from multiple secondary sources such as Annual Reports and industry surveys. Each construct will be operationalized using multiple objective measures. Several control procedures will also be initiated to ensure the comparability of data across firms.

Summary and Review of Subsequent Chapters

This chapter described the purpose of the study, delineated the research objectives, introduced the relationships and discussed the contingency model. Broad hypotheses were also presented. In chapter two, the significant literature upon which the model is based, is reviewed. The review will be used to develop, explain and justify the hypotheses. Chapter three presents a detailed explanation of the research methodology, and defensible reasons for the methodological decisions made at each stage. Chapter four describes the data collection and analysis procedures and the results of the hypothesis testing. Finally, chapter five discusses the implications of the study and provides suggestions for future research.

Chapter II: Literature Review

Introduction

An organization can be defined as a system of cooperation that provides the link between individuals and the environment whereby the collective efforts of individuals are applied to the accomplishment of a common purpose (Barnard, 1938). The open systems/contingency perspective of organizations (Katz & Kahn, 1966; Burns & Stalker, 1961) suggests that differing types of environmental conditions require differing organizational characteristics, responses and behavior patterns for effectiveness. Survival is dependant upon management's ability to maintain a dynamic equilibrium between the organization and the environment within which it operates (Barnard, 1938; Eisenstadt, 1959). Thus, the organization exists in an interdependent relationship with the elements of its environment (e.g. customers, suppliers, government, employees, etc.) and management must deliberately make strategic choices that will lead to accomplishment of desired objectives (Child, 1972).

The behavioral theorists (Cyert & March, 1963; March & Simon, 1958), developed a strong case for viewing the process of making complex decisions an outcome of behavioral factors rather than a mechanical quest for economic optimization. Building on this

theory, Hambrick and Mason (1984) suggest that strategic choice (in an organization) is influenced by the perceptual and cognitive orientations of top managers. Drawing on diverse literatures investigating the topic of top executive characteristics this logic is extended to propose that the “fit” between executive characteristics and strategy impacts on performance (Figure 1.2). In the following sections, the various aspects of the proposed model will be described, and justified by reviewing in detail the relevant literature that examines these relationships.

Two Research Streams

Studies examining the impact of executive characteristics can be divided into two distinct research streams namely, the study of the relationships between (a) executive characteristics and strategy and (b) executive characteristics and performance. Studies pertaining to these sets of relationships are reviewed below.

Executive Characteristics and Strategy

Literature examining the relationship between top executive characteristics and strategy can be divided into three distinct segments namely, ethnographic, normative and empirical (Gupta, 1984). Each of these segments are reviewed in the following sections.

The Ethnographic Studies: The more prominent ethnographic studies on top executives include efforts by Kotter (1982), Maccoby (1981), Mintzberg and Waters (1982), and Stengrevics (1981). These studies are relatively theory free examinations of a very small

number of executives. For example, Kotter (1982) studied the behavior of 15 successful general managers (GMs), from various industries over a period of 12 months. His data collection methods involved observing their regular daily routines for more than thirty hours, interviewing a dozen colleagues of each focal executive and the executive himself for more than 15 hours over the time frame of the study. He found some significant common patterns among these men. All the successful GMs were strongly achievement oriented, motivated and ambitious. They craved status and power and were personable and good at developing relationships with people. From these and other findings Kotter concluded that matching managers to appropriate jobs would enhance the organization's performance and success. While studies such as these provide for interesting results, conclusions drawn from them have limited external validity and generalizability due to the constrained nature of the sample and settings. Therefore their contribution toward theory development and testing is also extremely limited.

The Normative Studies: The prescription of this class of studies is the necessity for a match between the characteristics of top managers and the strategy of their organizations (Hofer & Davoust, 1977; Kerr, 1982; Leontiades, 1982; Miles & Snow, 1978; Tichy, Frombrun & Devanna, 1982; Wright, 1974). These conceptual arguments stem from the premise that different strategies pose different challenges to organizations, and therefore are best managed by executives with suitable characteristics. Many of these normative positions have resulted in typologies of strategies where individual strategies are accompanied by a description of the associated job requirements and appropriate managerial characteristics. However, as mentioned previously, testing and integrating these models is difficult due to the ambiguous nature of the terms used. Despite this problem, the normative studies do make a significant contribution to the research stream as they

strengthen the theoretical arguments for a strategy-manager match, and encourage empirical research toward their validation.

The Empirical Studies: The studies that empirically examine the linkage between executive characteristics and strategy have been few and far between. The available literature however, can be divided into two distinct segments, those efforts that employ a psychological/personality approach, and those that rely on observable, objective data. Among the studies that embrace the former approach, executive characteristics are operationalized along psychological dimensions (Gupta & Govindrajana, 1984; Miller Kets de Vries & Toulouse, 1982; Miller & Toulouse, 1986; Sturdivant, Ginter & Sawyer, 1985). To illustrate the methods employed, and the associated problems, a review of a key study follows.

The purpose underlying the research effort by Miller, Kets de Vries and Toulouse (1982), was to investigate the question of whether there was a relationship between the personality of a Chief Executive Officer (CEO) and his strategy making behavior. Drawing on theories in psychology and strategic management, they hypothesized that firms led by confident, aggressive and active CEO's would tend to undertake more innovative, risky and proactive strategies. In contrast, firms led by more passive CEO's who were given to feelings of helplessness, would pursue more conservative, reactionary and risk averse strategies. These distinct personality dimensions were operationalized through Rotter's locus of control instrument, which measures an individual's perception of the control exerted over the events in his or her life. For example, an internal person is convinced that the results of his behavior are the results of his own efforts, while the external person believes that the events in his life are beyond his control and can be attributed to fate. Based on these internal-external measures, the authors then developed a ques-

tionnaire which was administered in the form of an interview, to the CEO's of 33 business firms in the Montreal area. Their hypothesis was strongly supported.

Although the above effort is commendable, it must be noted that personality research at the CEO or top management team level is extremely difficult for many reasons. First, the theory that deals with psychological characteristics cannot be readily applied to a sample of top managers, who by their positions indicate that they are not representative of the general population for whom the theory was developed. Second, even if theories were available, instruments operationalizing these theories would have to be developed and validated. Most strategic management researchers do not have the requisite training in psychology to perform such a task. Third, unless unlimited resources were available, the sample of executives would have to be limited to a geographical area if data is to be collected through interviews. This would probably prohibit a random sample and also disallow a single industry study. - Fourth, interviewers would have to be trained to recognize appropriate cues and administer the instruments correctly. Even if all of these hurdles could be overcome, adequate information on the type of personality traits that influence strategy is not available. Therefore the development of a complete theory would require a compilation of all the relevant psychological characteristics, and a methodical evaluation and testing of each. Finally, certain characteristics such as functional background (which have been found to influence strategy), may not have psychological equivalents.

In order to overcome the above problems, Hambrick and Mason (1984) suggest a more basic approach. They propose that research begin with a focus on observable, objective characteristics such as age, functional background, tenure, socioeconomic background etc., for which data is readily available from secondary sources. This approach enables

the researcher to bypass some complex psychological issues in favor of an emphasis on broad tendencies. According to the authors, once these tendencies are empirically confirmed, they can be subjected to the 'psychologists finer lens'. The primary agenda for the advancement of the research stream is therefore an emphasis on theory development and testing. This approach has successfully been employed in divergent fields such as marketing, sociology, political science etc. However, as the following review of these studies illustrates that there is little commonality among the few studies that have examined the association between managerial characteristics and strategy.

Song (1982), attempted to study the link between diversification strategies of firms and the skills of their CEO's. He divided his sample of Fortune 500 firms (that had diversified during the period 1965-1980) into internal and acquisitive diversifiers based on their chosen mode of diversification. Skills of the CEO were operationalized by examining major area of formal education and duties in functional areas. A chi-square test indicated that CEO's with a career emphasis in production and marketing were significantly more likely to head organizations pursuing internal diversification. On the other hand, CEO's with backgrounds in finance, accounting and law were significantly associated with acquisitive diversifiers.

In another study, Channon (1979) attempted to examine the link between profiles of top managers, the strategies of their organizations and meaningful variations in economic performance. His sample consisted of the 100 largest service companies in the U.K. (based on turnover, capital employed and numbers employed). Using socio-demographic data on managers (such as level of education, prestige of educational institution, membership in prominent social clubs, military service etc.,) the sample was divided into firms that were entrepreneur led, family led and those led by professional management.

He then attempted to match the managerial characteristics to the diversification, internationalization and acquisition strategies of the firms. He found definite patterns of relationships. For example, entrepreneur led firms were the most highly diversified and pursued strategies of aggressive acquisition while family led firms showed no aggressive behavior in their acquisitions strategy.

Finally, Gupta and Govindrajan (1984) collected both primary and secondary data from 58 Strategic Business Units (SBU's) within eight Fortune 500 diversified firms. They found that greater marketing and sales experience, greater willingness to take risk, and greater tolerance for ambiguity on the part of the SBU general manager contributed toward effectiveness in the case of those SBU's following a "build" strategy but hampered those that were pursuing a "harvest" strategy.

While these studies demonstrate strong associations between executive characteristics and strategy and thus encourage further empirical investigation, it can be observed that there is no significant pattern in the conceptualization and measurement of the two constructs. Therefore, there is a need for the aggregation and integration of previous results and the development of a theory that encompasses and explains the cumulative findings of extant research.

In the next section studies that consider the relationship between top executive characteristics and performance are reviewed. Subsequently the literature is integrated and a research agenda for the progression of this stream of literature is suggested.

Executive Characteristics and Performance

Among the studies that have considered the relationships between top executive characteristics and performance there emerges no significant pattern either in the conceptualization of executive characteristics or in the measurement of performance. Some of the more prominent efforts in this research stream are reviewed below.

Using a sample of 82 British firms in six industries, Child (1974) found a strong association between company growth and management youth. Further investigation into this phenomena revealed that younger managers were more likely to challenge formal company rules, and felt greater pressure for change and innovation than older managers. From these results, Child concluded that management youth was probably an active influence on company growth and change. In another study, (discussed earlier) conducted on a sample of the 100 largest British service firms Channon (1979) found similar associations. Specifically, his results indicated firms led by entrepreneurs outperformed all other types of firms.

Hambrick and D'Aveni (1985), used a matched pair design to compare the characteristics of the top management teams of 60 large U.S. companies which experienced bankruptcy in the period 1970-1982 to the characteristics of their counterparts in financially successful companies belonging to the same industry. They found that a greater proportion of the executives in bankrupt companies had backgrounds in areas such as production, process engineering, accounting etc., shorter tenure, fewer technical degrees and fewer outside directors than the executives of the financially successful companies. Similarly, Virnay and Tushman (1986), using a cohort based analysis showed that the

profiles of the top management teams of high performing firms were significantly different than the profiles of top management teams in firms that had poor performance.

The most recent study in this area was conducted by Norburn and Birley (1988), using a sample of 150 companies in five industries. They found that there was a significant industry effect, i.e., there were significant differences in the TMT profiles between industries. However, further analysis indicated that there was considerable similarity among the TMT's of firms in growth industries as was the case with the managerial teams of firms in declining industries. Further, within each industry, they found differing profiles of managers of high and poor performing firms.

Most of the research presented above reflects raw empiricism. Researchers are involved in the search of executive characteristics associated with varying levels of performance without adequately considering the process by which these characteristics might influence performance or the internal structures and mechanisms of the organization. It is argued, that in order to understand this linkage more fully, it is necessary to address this question at a more theoretical level.

Evaluation of the Research Streams

From the above discussions and those presented in Chapter 1, we can draw a few preliminary conclusions.

1. The question of whether executive leaders have an influence on organizational outcomes, is no longer one of great controversy. Several recent theoretical and empirical research efforts have demonstrated with some force the strong association

between the characteristics of the critical members of an organization's management and its strategy and performance. The current areas of interest in this research stream are a search for theoretical explanations of these relationships and the sources of influence that top managers possess.

2. The empirical literature which considers the relationship between these variables is divided among those who examine executive characteristics and strategy and those that consider executive characteristics and performance.
3. In both these divisions, there is a strong movement that advocates the study of these relationships through the use of objective, observable characteristics.
4. The research stream as a whole is characterized by disjointed efforts that employ situation specific and unidimensional conceptualizations and operationalization of each construct. This problem is especially critical as it hampers the aggregation of research results.

Thus, if this stream of research is to progress an effort has to be made to consolidate previous findings to develop a model that will transcend the consideration of simple bivariate linkages and look at the relationship between executive characteristics, strategy and performance simultaneously. This research proposes to begin such a process in an attempt to build a middle range theory encompassing the three constructs.

Operationalizing the Model

Normative theory suggests that different capabilities and skills on the part of the top managers are required for the formulation and implementation of distinct strategies. Taking a contingency perspective, this logic is extended to suggest that organizations where the characteristics of the top managers fit or match the strategy being pursued, perform better than organizations that do not achieve such a match.

Unlike most of its predecessors, this model (Figure 1.2) attempts a more holistic mapping of a series of bivariate relationships into a multivariate framework. By incorporating 'fit' as the independent variable, a tripartite model that accounts for the impact of key executives on performance was derived. Contrary to traditional beliefs that managerial characteristics have an independent and direct impact on strategic orientation and performance, this model highlights the significance of matching managers to strategy. Thus, it provides a theoretically defensible explanation of the manner in which executive characteristics and strategy have a combined effect on performance.

The following sections will detail conceptual arguments by which this model can be operationalized and tested. The variables used in the model will be defined in multidimensional terms, and justified on the basis of previous literature. The actual operationalization of the variables and decisions regarding methods will be presented in the Chapter III.

Strategic Orientation

As indicated by the preceding discussion, there is no consistency in the way the strategy construct is conceptualized. Strategy was defined as the proactiveness of firms, the type of acquisitions they made, the degree of international expansion etc. The only common factor among these cases, was the focus on one or two key variables. The limitation of such a view of strategy is that it does not capture the breadth of decision areas that constitute the construct (Hambrick, 1980). Thus, a more comprehensive multivariate view that encompasses the different dimensions of strategy is required. An obvious solution to this problem would be the use of strategic archetypes or generic strategies. According to Herbert and Deresky (1987), a generic strategy is a categorization of strategic choice that is broadly applicable. These authors point out further, that generic strategies are useful because they highlight the essential features of separate situation specific strategies capturing their major commonalities in such a way that they facilitate the understanding of general strategic patterns.

As Table 1A indicated there are several taxonomies of generic strategies that provide lists of managerial characteristics best suited for the successful pursuance of each strategy. However, the majority of these taxonomies fail to provide concrete platforms for the operationalization of these characteristics. For example, Wissema, Van der Pol and Messer (1980) suggest that the expansion strategy will be best managed by a 'conqueror' type manager. They propose that the attributes of a conqueror include various levels of conformity, sociability, activity, pressure to achieve and style of thinking - but neglect to mention what these levels may be or how they can be measured. In contrast, Miles and Snow (1978) specify the managerial characteristics associated with the distinct stra-

tegies in objective and observable terms. Therefore the decision to operationalize the model using Miles and Snow's (1978) typology of strategy was made.

The Miles and Snow Typology: The Miles and Snow typology is grounded in management theory to a greater extent than other typologies (Hambrick, 1983). The authors relied heavily on the works of researchers such as Chandler (1962), Weick (1969) and Thompson (1967) in building their theoretical framework linking strategy structure and process.

Drawing on field studies in four industries namely, college textbook publishing, electronics, food processing and health care, Miles and Snow identified three viable strategies which they claimed would be found with in all industries. The following discussion briefly highlights the salient aspects of these strategies and the managerial characteristics associated with each of them.

Prospectors are described by Miles and Snow, to be industry leaders in product/market development. They compete by pioneering new product development and innovating new marketing techniques to beat their competitors to the market. Thus Prospectors are primarily externally focussed with an emphasis on leading the competition. Consistent with this profile, the leaders of Prospector firms are described as having backgrounds in output oriented functions such as marketing and product oriented research and development. Since experience in the areas of the firm's prospecting is considered valuable, the key executives are as apt to be hired from outside as to be promoted from within. Thus, the tenure of the top executives of Prospector organizations tends to be shorter than their counterparts in Defender and Analyzer organizations.

Defenders are organizations that engage in little or no product market development. They compete primarily on the basis of price, quality, delivery or service while concentrating on relatively secure niches in their industries. Defenders are predominantly inward focussed with an emphasis on efficiency and cost cutting. Based on these characteristics, Miles and Snow suggested that Defender organizations are primarily led by experts in throughput (process) oriented functions such as finance and production. Since expertise in the organization is valued, the tenure of these leaders tends to be lengthy due to the predominance of internal promotions.

Analyzers are described as an intermediate type between the above two extremes. They engage in less product market development than Prospectors, preferring to let others take the initial risk, and then quickly introducing similar products. While they are more efficient at production than Prospectors, they are less so than Defenders. Thus, the upper echelons of Analyzer organizations reflect this mix of Prospector and Defender characteristics.

Reactors according to Miles and Snow are the residual type. They are firms which have been unable to develop a consistent strategic orientation. As a result they experience low performance, and are forced to adopt one of the three viable postures or drop out of the market.

The Miles and Snow typology has garnered considerable empirical support (Hambrick, 1983; Snow & Hrebiniak, 1980; McDaniel & Kolari, 1987; Smith, Guthrie & Chen, 1986; Chaganti & Sambharya, 1987), and continues to be tested and refined. However, to date there has only been one study that examined the association between managerial characteristics and organizational strategy in this context. Chaganti and Sambharya (1987)

examined the top management teams of three firms (previously classified as Prospector, Defender and Analyzer by Robert Miles, 1982). The authors found that Prospectors compared to Analyzers had stronger outsider and marketing orientations, compared to Defenders stronger outsider R&D and production orientations. Since only three firms were used, these results have to be interpreted with extreme caution, and are limited by lack of external validity.

Thus it is apparent that while the Miles and Snow typology as a whole has gained considerable empirical support, there is very little empirical evidence for the association between the proposed managerial characteristics and the various strategies in the typology. Despite this, researchers have used the managerial characteristics (suggested by Miles and Snow to be associated with the different strategies) to classify the strategic orientation of firms (Smith, Guthrie and Chen, 1986).

Thus, in addition to providing a multidimensional framework of strategic orientation, the use of the Miles and Snow framework facilitates the classification of executive characteristics in objective, observable terms features compatible with the goals of this study. Further, this setting will allow for a validation of their (Miles and Snow's) contentions regarding the association between upper echelon characteristics and strategic orientation on a large sample of firms in a single industry.

Executive Characteristics

In order to consolidate the results of previous research efforts, and move the research stream a step forward it is suggested that executive characteristics should also be conceptualized as a multidimensional construct. Therefore those individual variables that

have been found to be significant in previous empirical or theoretical studies will be added to the ones proposed by Miles and Snow to constitute the different dimensions of this construct. It is anticipated that the combination of dimensions previously found to be significant will increase the total explanatory power of the construct. The following section highlights these variables, and justifies their applicability in this study.

Age: The few studies that link age with organizational characteristics, strategy and performance yield very consistent results. Age has frequently been said to contribute heavily to both the manner in which a decision is reached and decision quality (Kirchner, 1958; MacCrimmon & Taylor, 1976; Survillo, 1964;). For example, in a 1975 study, Taylor examined the influence of age on managers performance using a sample of industrial line managers. He systematically removed the influence of general managerial decision making experience in the type of decision studied, and level of management. This was done in order to control for the variation in the results that could be attributed to the difference in experience, and hierarchical level between younger and older managers. Taylor (1975) found that within the typical range of ages represented by managers, older managers had difficulty in integrating information, took longer to reach decisions and required greater amounts of information. Further, older decision makers were less confident of their decisions in the face of adverse consequences to the choice, and more flexible in altering them.

Among the studies that have considered age of the dominant coalition or chief executive officer, Child (1974) found that youth in managers was strongly correlated with higher organizational growth. Child explained these results by suggesting that younger managers were able to expend more physical and mental effort on promoting change and growth in their companies. He also found that they were more likely to challenge formal

rules and felt more pressure for change and innovation. Similar studies by other researchers have indicated that older managers have a greater commitment to organizational status quo (Alutto & Hrebiniak, 1975; Stevens, Beyer & Trice, 1978). This effect may be explained by the fact that they are at the point in their lives when financial and career security are of prime importance (Carlsson & Karlson, 1970).

Although Miles and Snow (1978) did not investigate the distribution of age among the dominant coalitions of organizations pursuing different strategies, logical arguments can be made for significant differences. The consistent conclusion of the research efforts examining the effects of age was that older managers were more conservative in their decision making, and less concerned with corporate growth than their younger counterparts. They are more likely to adhere to traditional methods of decision making and avoid risk. This type of behavior is more consistent with the Defender strategy where growth occurs cautiously and incrementally, and a narrow stable domain is created through a limited mix of products and customers. Since the focus is on efficiency and control, the need for risk taking and the aggressive pursuance of new markets and customers is limited.

On the other hand, the Prospector mission requires the finding and exploiting of new product and market opportunities, growing in spurts when such opportunities arise. The domain of the Prospector firm is always changing, needing the managers at the top to be at the helm of these changes. This task involves considerable risk taking and energy. Thus on the average, we would expect to find older managers leading Defender firms, and younger managers at the head of those organizations pursuing a Prospector strategy.

Functional Background: Hambrick and Mason (1984) suggest that the top managers of corporations inevitably bring to their jobs an orientation developed from experience in some primary functional area. They cite the work of Dearborn and Simon (1958), who found that when a group of executives from different functional areas were presented with the same problem, and asked to consider it from a company wide perspective, they defined the problems largely in terms of their own functional areas.

In terms of the relationship between strategy and functional backgrounds, Song (1982) found that the areas of functional specialization of the CEO's were strongly associated with the type of diversification strategy pursued by their organizations. Similarly, Hitt Ireland and Palia (1982) demonstrated that "the strategic importance of organizational functions was found to vary by grand strategy being followed by the firm".

Miles and Snow (1978) suggested that the upper echelon managers of organizations pursuing different strategies would have backgrounds consistent with the requirements of these strategies. Therefore, Prospector firms were expected to be led by managers with expertise in marketing and research and development (output oriented skills) while Defender firms would have managers predominantly from finance and production (throughput oriented skills). In a test of distinctive competences associated with the different strategies proposed by Miles and Snow, Snow and Hrebiniak (1980) found Defenders to have strengths in general management, financial management, and production while Prospectors were distinguished by their capabilities in general management, engineering and product research and development. Chaganti and Sambharya (1987) who tested specifically for the association between executive backgrounds and strategy also had distinctive results.

Based on the above discussions, it can be concluded that functional background does indeed vary with strategy and that the leaders of Prospectors and Defenders can be expected to have distinctly different functional experiences.

Tenure/Origin: According to Chung, Lubatkin, Rogers and Owers (1987), each year 10%-15% of major corporations change their CEO's. Among these, 80%-85% select new CEO's from outside their organizations. The merits of hiring CEO's from within and without the organization has been hotly debated in the management literature for a considerable period of time. Studies that have examined CEO succession have consistently concluded that CEO's brought in from outside are associated with change in organizations to a significantly greater extent than CEO's promoted from within the firm (Carlsson, 1972; Helmich & Brown, 1972; Kotin & Sharaf, 1967). The behavioral reasons for such a phenomena are varied and include, less commitment from an outsider to the status quo, a desire to resist those who might weaken the new CEO and the desire to create a more loyal staff.

However, Kotter (1982) defended the hiring of inside executives by asserting that successful managers acquire expertise through long tenure with the company. According to him insiders have an advantage over outsiders for two reasons. First, insiders are more knowledgeable than outsiders about a firm's specific products, markets, customers and employees. This knowledge in turn facilitates the understanding of large, complex and diverse sets of activities in the making of important decisions. Second, insiders have established social networks -- including subordinates, peers and others through which they gain the information and support needed to perform their job. On a related vein some researchers (Gupta, 1984; Galbraith, 1973; Weick, 1969) have argued that in intra-organizational terms, the more tightly integrated an organization system needs to be,

the greater the need for lateral relations among top managers in order to facilitate the interaction between managers of various organizational sub units.

It would seem therefore, that organizations which are more internally focussed should have leaders who are experts in the internal systems of the firm. It would be expected that these leaders would be promoted from other positions within the firm. On the other hand, firms that are more externally focussed would need leaders who have a knowledge of new the environments within which the firm wishes to operate, as well as its internal capabilities and therefore would be equally apt to be hired from outside or be recruited from within the firm. These conclusions are consistent with Miles and Snow's descriptions of the dominant coalitions of Defenders and Prospectors. Since the Defender focuses on the functions of administration and engineering, the dominant coalition does not need to possess expertise in externally oriented areas. Thus they observed that typical Defender firms are led by executives who have had lengthy tenure and have been promoted from certain functional areas within the organization. On the other hand, they propose that the dominant coalition of Prospectors is more transitory. In other words, the influence of the leaders vary according to the firm's current areas of prospecting. Thus leaders of organizations pursuing a Prospector strategy tended to have shorter tenures and are as apt to be hired from outside as to be promoted from within the firm.

Level of Education: An executive's formal educational background may be viewed as an indication of his or her knowledge or skill base. The consistent finding examining the relationship between level of education and organizational characteristics is that better educated executives are more receptive to innovation (Kimberly & Evansiko, 1981; Boecker, 1988; Becker, 1970; Rogers & Shoemaker, 1971). Those leaders who are more

highly educated are more likely to stress the importance of innovation in the firm's competitive approach. Since innovation, and the creation of a climate that supports entry into new product domains, is critical to a Prospector strategy, it is suggested that the leaders of organizations pursuing these strategies will be more educated than their counterparts in Defender organizations where innovation and risk-taking, are relatively less important.

Performance

Since the goals of Prospectors and Defenders are distinctly different (domain expansion versus efficiency), the level of success of these organizations is also measured in different ways. Prospectors measure their success through external indicators such as growth in market share, while Defenders who are more efficiency oriented rely on internal indicators. Consequently, both external and internal measures of performance will be utilized to capture this construct.

Summary

This chapter reviewed the literature pertaining to the relationships and linkages among executive characteristics, strategy and performance. The model presented in chapter I was also substantiated through arguments derived through the integration of previous studies. The three constructs were defined in conceptual terms and justified on the basis of prior literature. The next chapter presents a framework of settings and methods for the test of the contingency model.

Chapter III: Research Methodology

Introduction

The primary purpose of this chapter is to describe a framework of settings and methods that will provide for an accurate test of the model portrayed. Since this study is exploratory in nature, and the goals are simplicity and accuracy, rather than generalizability, the decision was made to limit the test of the relationships to a single industry at a single point in time. All constructs will be operationalized in a multidimensional manner, using objective, secondary data. Data analysis will include tests of internal consistency, and apriori confirmatory tests such as the Students t. A detailed description and justification of the decisions regarding sample, setting and methods follows.

Research Setting

Although Miles and Snow (1978) contended that each of their three strategies could be observed in any industry setting, Hambrick (1983) points out that strategy is a relative phenomenon. An organizations strategy can be cogently discussed only relative to the strategies of its immediate competitors. He cites the example of Lawrence and Lorsch's

(1967) study on two dissimilar industries - standardized containers and plastics. The container industry was mature and commodity like, and primary competitive requirements were low prices and reliable delivery. No industry sales came from products innovated in the previous five years. In contrast, the plastics industry was in its growth stage and highly differentiable; its primary competitive requirements was for new products and new product applications. Of total industry sales, new products comprised 15%. If new product sales were used to operationalize Miles and Snow's typology across the two industries, there would emerge a significant classification error (Hambrick, 1983).

Similarly, Norborn and Birley (1988) observed that the characteristics of CEO's varied to some extent by the type of industry they operated in. For example, the demographic profiles of executives in growing industries differed significantly from their counterparts in declining industries. In order to avoid the potential confounds of industry environments, such as life-cycle of the industry, technology of the industry etc., the decision was made to restrict the sample of firms in this study to a single industry namely the electronics and computing industry.

This high-profile industry has captivated the imagination of the American public during the last decade. It is an industry of entrepreneurs that has grown up at lightning speed. Experts observe due to the rapid pace of technological innovation and obsolescence, the firms in this industry have evolved faster than their counterparts in other industries. For example, Apple computer made the Fortune 500 roster less than five years after it was formed in a Silicon Valley garage. Compaq, was the first firm to ever do more than \$100 million in sales in its first year of operations. On the other hand, there are firms such as NCR that are over a hundred years old, that have carved out relatively stable niches

of this changing industry and slowly adopt the new technology to better service a well-defined set of customers.

This research considers the computer industry in the years 1986-87 when it was recovering from a two year slump (1983-1985). After many years of double digit growth, this downturn came as a surprise to most of the participants in the industry. Organizations were now confronted with the reality that their corporate cost structures were too high for the extremely competitive environment predicted for the next decade (Standard & Poors Industry Surveys, 1987). As a result, major cost-cutting and restructuring programs became common. Some firms streamlined their operations through the reduction of their labor force, closing down of unprofitable ventures and limiting research spending. In direct contrast, others increased their commitment to new product development and began to explore the possibilities of international expansion. Firms went bankrupt, merged with competitors and some even replaced their entire management teams. However, by 1986, most of these changes had taken effect, and the strategic direction of the industry as a whole was clearer and better defined. Thus, this setting provides a unique mix of diverse competitive behaviors and organizational postures.

Data Collection Method

Snow and Hambrick (1980) discuss four major approaches toward measuring strategy. These are, (1) investigator inference (i.e., the researcher using all the information available to assess the organization's strategy); (2) self-typing (i.e., the organization's top manager's characterize the organization's strategy); (3) external assessment (i.e., experts external to the organization characterize the organization's strategy; and (4) objective

indicators (i.e. strategy is measured using objective data sources rather than relying on the perception of individuals).

Of these measurement approaches, the one most commonly adopted in strategic management research, is the self-typing measure, where a questionnaire is sent to the top managers in an organization. These members provide information about the firm's strategy, and this information becomes the database for the effort. However, recently, many strategic management researchers have criticized research in the field for relying too heavily on this type of primary, perceptual data to type the strategy of an organization. Snow and Hambrick (1980) highlight some of the weaknesses associated with this approach:

1. Many managers believe that their organizations are unique and resist efforts to classify them.
2. Empirical evidence suggests that the perception of strategy may vary from manager to manager.
3. Executives generally tend to report their organization's intended strategy rather than their realized strategy and when no intended strategy exists, the executive might create one for the benefit of the researcher.
4. Asking only the organization's managers to assess strategy does not permit external, objective confirmation of their answers.

In addition to these shortcomings, Huber and Power (1985) suggest some others that are associated with subjective, primary data. According to these authors, informants in firms may provide inaccurate or biased data because they are motivated to do so by forces such as need for achievement, security and social acceptance. Further, there is the possibility that they lack crucial knowledge about the event of interest. Finally, inaccuracies due to improper data elicitation procedures (such as a badly phrased question etc) cannot be ruled out. All of these shortcomings tend to threaten the reliability and internal validity of the data being collected. Although many of these shortcomings can be overcome through the use of multiple respondents and strict controls for validity and reliability, the decision to bypass these problems through the use of more objective data was made. Therefore, secondary sources of data were used in this study.

Secondary data sources include material published by the organization for its shareholders. The company annual report is such a publication. It includes detailed information on the highlights of the companies activities for that year, plus externally audited financial statements. Another publication all public companies are required to put forth each year is the form 10-K. This document which is available to the public is drafted to satisfy the requirements of the U.S Securities and Exchange Commission (SEC) and includes standardized information about a firm's business, a summary of operations, properties, parents and subsidiaries, legal proceedings, cost at current prices of replacing inventories, property plant and equipment and a host of other information. Non-company sources of data include trade association publications, COMPUSTAT II tapes, industry reports, and the business press.

The advantage of using secondary data is the the ability to validate information by cross-referencing multiple sources. Since individual biases are removed to a large extent,

by standardized reporting procedures, the data can also be more reliable. Finally, since secondary sources provide information about the organization's realized rather than intended strategy, more accurate portraits of the organization's actions are possible.

Population

The population from which the sample will be derived consists of all public companies operating in the electronic computing equipment industry. In 1988, there were approximately 439 firms in this population. Since basic data is available on almost all of these organizations, the entire population was used as a starting point for the research, thus overcoming the specific costs and benefits associated with the different sampling techniques.

Operationalization of Constructs

Strategic Orientation

As mentioned previously, strategy will be conceptualized using the framework provided by Miles and Snow (1978). Since this is an exploratory effort, with the explicit purpose of theory building, it was decided that the two maximally different strategic types of the typology, namely Prospectors and Defenders would be used to operationalize the construct. Based on the theoretical description of strategies and subsequent empirical research on the typology four measures, designed to capture the distinct dimensions of

the two strategic postures are proposed. A brief description of each of these measures, along with their purpose is provided in the following section.

Fixed assets per employee: is a measure derived from an earlier study of the Miles and Snow typology (Hambrick, 1984). This is a standardized ratio that measures how efficiently an organization utilizes its total assets. Hambrick (1983) suggests that since Defenders address the engineering problem through an emphasis on efficiency (routinized, single core technologies, standardized products, etc.), they are expected to have higher scores on this ratio.

Selling expenditures: represent the amount of money an organization spends on marketing its products each year. According to Miles and Snow (1978), Prospectors can be expected to spend more, since marketing is one of the main thrusts of their strategy which emphasizes finding and developing new markets. Thus a high score on this measure would represent a Prospector orientation. This measure can be standardized by deriving a ratio of selling expenditures per dollar of sales.

This measure or a variant, has been validated by many researchers who have attempted to operationalize the Miles and Snow (1978) typology (see for example, McDaniel & Kolari, 1987; Ruckert & Walker, 1987).

Research and Development expenditures: Miles and Snow (1978) argue that a firm's emphasis on research and development is indicative of its strategic orientation. Specifically Prospectors place more emphasis on research and development since they grow through the introduction of new products, and by being the first to market. This measure will be standardized by computing R&D expenditures as a ratio of sales. A high

score on this measure would indicate a Prospector orientation. This measure has also been validated in a previous studies by researchers such as Hambrick (1983) and McDaniel and Kolari (1987).

The measures detailed above were derived from the empirical and theoretical literature. Thus each of the above measures is theoretically defensible and all of them have been validated in previous empirical efforts using secondary data to study the Miles and Snow (1978) typology. The measures were chosen on their theoretically predicted ability to distinguish between the efficiency (internal focus) of a Defender strategy and the flexibility (market focus) of the Prospector strategy.

Executive Characteristics

The strategic choice paradigm articulated by Child (1972) postulates that the decision makers in an organization exercise considerable control over the destiny of their firms by making choices about product market domains, technologies and internal structures. In an organization, strategic choices are typically made by those executives whose influence on the system is greatest, or in other words, by the dominant coalition (Cyert & March, 1963; Selznik, 1957; Miles & Snow, 1978; Pfeffer & Salancik, 1978; Hambrick & Mason, 1984). Since the dominant coalition is an emergent social system in an organization, its composition and size will vary with the type of organization and the environment it faces. Although many studies have operationalized the dominant coalition as those executives with the title of vice-president, and above and/ or the board of directors, we believe that this classification is subject to much interpretation and is influenced by size and organization structure. For example a small organization with a functional structure may have only three vice-presidents whereas a very large organiza-

tion can have over twenty members with that title. Further, research indicates that the involvement of the board of directors can vary from minimal to a great deal (Wheelan & Hunger, 1989). Finally, since Prospectors and Defenders are described to have different structures, an arbitrary classification of the dominant coalition based on job-title would be inaccurate.

Therefore, drawing upon a rather large body of literature that suggests that the CEO's of firms provide the primary direction for strategic decision making by leading the dominant coalitions (Pearce & De Nisi, 1983; Hosmer, 1982; Pearce, 1981; Lorange, 1980; Mintzberg, 1978; Pearce & Robinson, 1987), the decision to use the Chief Executive Officer (CEO) as a surrogate for the dominant coalition, was made. Further, a control will be instituted to ensure accurate portrayal of the CEO's influence on the organization. In order to qualify for the sample, the CEO would have to have held that position for a minimum of two years at the time of the measurement of strategic orientation and firm performance. This lag will be incorporated to allow sufficient time for the decisions of the CEO to be reflected in the organizations realized strategy and performance.

CEO characteristics will be operationalized through the use of multiple measures. The dimensions comprising this construct will be age, functional background, tenure, origin, and level of education. As explained in Chapter II, these variables were used in previous studies, and individually found to have significant associations with some organization characteristic. In the test of the proposed model they will be used as components of a single construct, as it is anticipated that their total effect will be more significant than any single indicator.

Age: will be measured as the chronological age of the CEO. It is expected that Prospector firms will have younger CEO's than Defender firms.

Functional Background: Based on the backgrounds found among the CEO's of the organizations, functional background will be coded as a metric variable to reflect output or throughput experience. Output experience will include backgrounds in marketing, product research and development and administration while throughput experience will include backgrounds in finance, engineering and manufacturing (Chaganti & Sambharya, 1987; Miles & Snow, 1978). The area where the CEO spent the longest amount of time will be used to determine his or her functional background (Song, 1982). It is expected that the CEO's of Prospector firms will have a predominance of output experience while Defender firms, consistent with their strategy, will be led by executives whose experience centers around throughput functions.

Tenure: This variable will be operationalized by counting the number of years that the executive has served in the organization. Since Defenders value expertise in the internal systems of the firm, it is expected that the CEO's of Defenders will have longer tenure than the CEO's of Prospectors. As mentioned previously, the CEO would have to have held his or her position for a minimum of two years at the time of measurement of strategy and performance (1987), to qualify for the sample.

Origin: This variable is designed to detect whether the CEO was promoted to his or her position from a functional area within the organization or recruited from outside. For the purposes of this study, an internal promotion is considered to have occurred when the executive has been with the firm for a minimum of five years before being promoted to the position of CEO. Since Defenders are characterized by a predominant internal

focus, they are more likely to promote executives from inside the organization than to recruit them from other organizations.

Level of Education: To operationalize this variable, a coding scheme will be devised whereby each year of college education earned by the CEO will be added to a base score of 12 (for example, bachelor's degree = $12 + 4 = 16$, masters degree = $12 + 6 = 18$ etc.). As discussed earlier it is expected that the CEO's of Prospector firms will have higher levels of education than their counterparts in Defender organizations.

Performance

Given the distinct internal focus of the Defender strategy and external focus of the and Prospector strategy, it follows that their mechanisms for performance appraisal will also be different (Hambrick, 1983; Miles & Snow, 1978). Defenders who are primarily concerned with the efficiency of their operations, usually assess performance by "meticulously counting the quantities and costs of standardized inputs required per unit of output" (Miles & Snow, 1978 p. 46). For Prospectors, who are continuously seeking to expand their domain and are therefore undergoing relatively constant change, the measurement of efficiency is difficult and less meaningful. Thus, Prospectors evaluate their performance through external means such as comparing their results with that of similar organizations. Good performance on one of these dimensions often means sacrificing performance on another (Donaldson, 1984). Due to this divergence in performance objectives, separate performance measures are necessary to adequately assess the outcomes of these distinct strategies.

In light of the above discussion, both financial (internal), and market based (external) measures will be used as indicators of organizational performance. Following is a brief description of the intended performance measures.

Return on Investment (ROI): is the most conventional measure of business performance. This indicator (total investment/total sales) measures the rate of return on total assets utilized in the company. This indicator is a measure of management's efficiency - it shows the outcome of a business' programs in relation to the resources employed in implementing them (Ruekert & Walker, 1987). ROI will be used as a measure of performance for only the Defender firms in the sample. Thus, the ROI of the Defender firms achieving a match between executive characteristics and performance will be contrasted to the ROI of those that do not achieve such a match.

Percent Change in Sales: is a market based measure appropriate for measuring the performance of Prospectors whose goals are to continuously broaden and expand their domain. Thus, the percent change in sales for Prospectors achieving a match between executive characteristics and strategy will be contrasted with the same measure of Prospector firms that fail to achieve a match. This measure captures the effectiveness of an organizations' strategy or "the success of a business' products and programs in relation to those of its competitors in the market" (Ruekert & Walker, 1987, p. 19).

Since the testing of the hypotheses does not require the comparison of the relative performance of Prospectors with Defenders, the use of two different measures to assess the performance of firms pursuing each of the distinct strategies is justifiable. Measures for each of these indicators will be taken for only two consecutive years as the object of the measurement is to assess "current corporate performance" rather than the "success" or

"failure" of the organization. Further, due to the short product-life cycles and the rapid rate of technological advances and obsolescence, two years is considered to be a relatively a long period of time in the computer and electronics industry.

Control Variables

Since only firms from a single industry will be included in the sample, the variations in industry environments and technology will be controlled to the extent possible. Further, the use of ratios and standardized measures serves to control for organizational size which could potentially confound results given the expected variance in magnitude and scale of operations between large and small firms.

Determining Strategic Orientation

The variables or measures designed to distinguish between strategies can be broadly categorized into those that focus on a firm's flexibility or market orientation and those that capture its efficiency or internal focus. Miles and Snow (1978) argued that Prospectors were the most market oriented of the three viable strategic types and therefore needed to possess greater degrees of flexibility which would allow them to respond to changing markets. The trade-off for this flexibility was efficiency, and therefore Prospectors have less efficient operations than Defenders or Analyzers. In contrast, Defenders have a distinct internal focus that is characterized by their single core technologies, routinized modes of production, standardized products and their constant emphasis on efficiency. They grow by penetrating old markets rather than developing new ones. Due to their internal focus and limited environmental scanning, their ability to adapt to

changing markets is extremely constrained. Thus the Prospector and Defender strategies could be conceptualized as being arranged on opposite ends of a strategy continuum that represents efficiency and flexibility. This view is consistent with Thompsons (1967) argument that firms are constantly faced with the conflict between the dual goals of flexibility and efficiency.

Based on this theoretically defensible argument the decision to develop a unidimensional scale of strategic orientation, was made. Each firm will be arrayed on this scale (determined by total cumulative scores achieved on strategic orientation variables) in order to determine their propensity for Defender-like or Prospector-like behavior. Once arrayed, the firms falling on the two extremes (below the 25th percentile and above the 75th percentile of the distribution) will become the basis for the hypothesis testing and used in further analysis.

Hypothesis Testing

Based on the previous justification of the constructs and the above operational definitions of the measures, the hypotheses can now be stated in their operational forms.

Hypothesis 1

Hypothesis 1 stated that: **CEO's of firms pursuing Prospector strategies will have significantly different demographic profiles than the CEO's of firms pursuing Defender strategies.** This hypothesis will be broken up into seven sub hypotheses as follows:

Hypothesis 1a: The CEO's of Prospector firms will be younger than the CEO's of Defender firms.

Hypothesis 1b: The CEO's of Prospector firms are more likely (than the CEO's of Defender firms) to have backgrounds in output functions.

Hypothesis 1c: The CEO's of Defender firms are more likely (than the CEO's of Prospector firms) to have backgrounds in throughput functions.

Hypothesis 1d: The CEO's of Prospector firms will have shorter tenures than the CEO's of Defender firms.

Hypothesis 1e: The CEO's of Prospector firms will have higher levels of education than the CEO's of Defender firms.

Hypothesis 1f: The CEO's of Defender firms are more likely to have been promoted from functional areas within the organization.

Hypothesis 1g: the CEO's of Prospector firms are as likely to be promoted from within as they are to be recruited from outside the organization.

These hypotheses can be tested through students t-tests for the metric variables and non-parametric tests such as the Chi-Square for the non-metric variables.

Hypothesis 2

The five dimensions of the executive characteristics construct can be aggregated into two "ideal type" profiles namely Profile P and Profile D. Each of these profiles respectively describe the characteristics most compatible with the distinctive competences of the Prospector and Defender strategic orientations. Table 3.1 provides a list of the relative levels of each of the demographic characteristics that comprise the two profiles. The profile of each CEO will then be compared to the strategic orientation of the firm. When the two constructs match (for example, Profile P with a Prospector strategy), a fit will be defined. Within each strategic group the performance of the matched group and the unmatched group will be compared through students t-tests to determine whether a fit is associated with higher performance.

Table 3.1
Summary of the Two CEO Profiles

CEO Characteristics	Profile P	Profile D
Age	Younger	Older
Functional Background	Output Oriented	Throughput Oriented
Tenure	Shorter	Longer
Origin	Internal Promotion and External Recruitment	Internal Promotion
Level of Education	Higher	Lower

Hypothesis 2: which stated that: **Organizations that achieve a match between their strategic orientations and CEO profiles will perform better than organizations with the same strategic orientation, can now be operationally restated as:**

Hypothesis 2a: Prospector firms led by Profile P CEO's (match) will have higher rates of sales growth than all other Prospectors in the industry.

Hypothesis 2b: Defender firms led by Profile D CEO's (match) will have higher ROI than all other Defender firms in the industry.

Summary

This chapter defined the measures that will be used to operationalize each of the three constructs specified in the research model. The research setting, data sources and data collection methods were presented. Finally the statistical analysis procedures and control mechanisms were described and justified. Chapter IV addresses the issues of precision, validity and reliability and reports the results obtained from the hypothesis testing.

Chapter IV: Data Analysis and Results

Introduction

The preceding chapters described a research model that integrates and extends existing literature in the field of upper echelon theory and strategic leadership. Testable hypotheses derived from the model were proposed and a detailed methodology describing the process of hypotheses testing was presented. The purpose of this chapter therefore is to report the data collection techniques and discuss the findings obtained from the empirical examination of the model.

Data Collection

Firm Data

The first step in the data-collection procedure was to compile a complete list of firms that were associated with this industry. To accomplish this objective, multiple sources including the Dow Jones News Retrieval Service, Standard & Poor's Industry Surveys (1987), Ward's Directory of 51,000 Largest Corporations (1987), Moody's Handbook

of Common Stocks (1987-1988), and Compustat II tapes were consulted. This search resulted in a list of 439 publicly owned firms that had varying levels of involvement in the industry under study. The addresses and telephone numbers of each of these firms were obtained and a letter requesting copies of annual reports, 10-K reports and other financial and qualitative reports was sent to the Public Relations Director of all the firms. Over the course of the following two months, information from 224 firms was received.

Simultaneously, all information available on the 439 firms identified to comprise the preliminary population was collected from the Dow Jones News Retrieval Service.

Executive Data

Data on the top executives of these firms were also collected from multiple sources including the Annual Reports, Form 10-K, Dow Jones News Retrieval Service, Dun and Bradstreet's Reference Book of Corporate Managements, America's Corporate Families, etc. Since each of the different sources provided different types of executive information, less complete data were available for this construct.

Identifying the Population

The next objective was to narrow the population down to a more homogeneous group of single business organizations. This was necessary to justify the use of the Miles and Snow (1978) typology, which is recognized in the literature as being applicable at the business level rather than the corporate level, and to establish comparability across organizations. In this regard, Rumelts (1974) definition of dominant business was used.

Thus, only those firms that had more than 70 percent of sales solely in the electronic computing equipment industry were to be included in the list.

To accomplish this goal, the business descriptions and Standard Industrial Classification (SIC) codes of each of the 439 firms were independently scrutinized by the primary researcher and three other 'experts' who had extensive knowledge of the computer industry. Each person was asked to classify every firm into one of four categories namely:

- (A) Firms that were solely involved in the computer industry (100% sales)
- (B) Firms that were primarily involved in the computer industry (> 70% sales)
- (C) Firms that were tangentially involved in the computer industry and
- (D) Firms that had no involvement in the computer industry.

The decisions made by each of the four raters were then compared and revealed extremely high consistency in classification. When disagreements on classification arose, the annual reports and other qualitative data were examined. In those cases when this procedure did not result in the unanimous classification of a firm into a particular category, the firm was assigned to the lowest category chosen by the raters. For example, if two of the experts classified a firm as belonging to category (B), and the other two thought it belonged in category (C), the firm was assigned to category (C). Firms thus classified into categories (A) and (B) were included in the sample and firms in categories (C) and (D) were eliminated.

The raters were then asked to identify firms that were conglomerates, holding companies, companies headquartered outside the United States and companies whose primary environment differed from the majority of firms in the sample. Examples of this latter category are software firms whose investment patterns differ significantly from mainstream computer manufacturers or firms that receive the majority of their revenues from

contracts with the U.S. Department of Defense or other government agencies. Prior investigation revealed that the competitive forces such as barriers to entry, bargaining power of buyers and suppliers, rivalry among competitors, and threats of new entrants and substitute products were significantly different for such firms. These firms were then eliminated from the sample as were all firms that exited the computer industry in the years 1985, 1986, 1987, or 1988.

These processes resulted in a final population of 224 firms that encompassed a broad range of participants in the computer industry such as the manufacturers of supercomputers, full-line computer manufacturers and the specialized operations of disk-drive makers. Despite differences in focus these firms faced a relatively homogeneous competitive environment.

Describing the Data

In order to better understand the nature of the data obtained, measures of spread and location were computed separately for the data obtained on organizations and Chief Executive Officers (CEO's). Table 4A provides the means and standard deviations of the firm level data for all the organizations in the final population, and illustrates the tremendous inter-firm variation due to the effects of organizational size. For example, the standard deviation in the total assets category is greater than the mean. This phenomenon can be attributed to the fact that the population includes firms such as IBM, which have assets in excess of \$100,000,000 as well as small entrepreneurial ventures with assets valued at approximately \$100,000. This variation reinforces the need to use standardized measures which control for the spurious effects introduced by organizational size. Table

4B presents the same statistics for the CEO data. In this instance, comprehensive information was not available for all items. Therefore, the numbers for level of education and position tenure reflect data gathered on 150 CEO's.

Table 4A
Descriptive Statistics for Firm Data

n = 224

Variable	Mean	Standard Deviation
Sales	\$592,368,411	\$3,547,350,731
Number of Employees	5,426	26,931
Total Assets	\$588,054,524	\$4,069,312,570
Selling Expenses	\$156,370,498	\$1,051,558,200
R&D Expenses	\$53,583,904	\$375,994,104
Fixed Assets / Employee	\$144,420	\$489,266
Selling Expenses / Sales	\$0.438	\$1.233
R&D Expenses / Sales	\$0.158	\$0.480

Table 4B
Descriptive Statistics for CEO Data

n = 150

Variable	Mean	Standard Deviation
CEO Age	52	8.7
Tenure in Company	14	10.2
Tenure in Position	11	9.3
Level of Education	17	2.5

Measurement and Control

Every scientific endeavor is subject to varying forms of error. The task of the empirical researcher is to reduce the magnitude of these errors in order to capture what is 'real'. Rosenthal and Rosnow (1984) set out three statistically and logically related criteria by which errors can be minimized throughout the research process. These are validity (the degree to which we observe what we purport to observe), reliability (the degree to which our observations are consistent or stable) and precision (the sharpness or exactness of our observations). The use of each of these criteria in this study will be briefly discussed in the following sections and continuously addressed throughout this chapter.

Precision and Reliability

The precision of the data collection procedure was enhanced by the use of standardized objective-secondary data which eliminated a number of problems commonly associated with self-report or questionnaire data. However, the reliability of published data is threatened by errors in reporting, clerical errors and errors due to changing conditions over time. In order to protect against these errors several procedures were initiated. As mentioned previously, data was collected from several sources. To confirm the accuracy and the reliability of the firm data a random sample of 50 firms was chosen. Financial information from the balance sheets and income statements was then compared (actual information from financial statements sent to us versus information from Dow Jones News Retrieval Service, and other sources) to check for errors or discrepancies across sources. None were found. A similar check was conducted for the data collected on Chief Executive Officers.

Insufficient reliability occurs when an observation is repeated and fails to yield sufficiently similar results even when the situation remains unchanged (Rosenthal and Rosnow, 1984). To protect against this type of error, both strategy and executive characteristics were measured for the three years of the study (1985, 1986, 1987) for a random sample of 50 firms. Correlation coefficients for each of the measures were then calculated. The results of this procedure revealed almost perfect linear correlations (.98 or above significant at .0001), thus attesting to the reliability of the data.

Validity

Cook and Campbell (1979) identify four types of validity namely: statistical conclusion validity, internal validity, construct validity and external validity. Each bears a relationship to the different stages in the research process. Thus, at this stage, the major concern was construct validity. Measures taken to remove the errors associated with construct validity are now described.

Construct validity can never be established, only inferred. Further, construct validation is an ever extending process of investigation and development that requires the aggregation of results from both logical deductive reasoning and a series of reliability and validity studies (Cronbach, 1971; Peter, 1981). According to Campbell (1960), construct validation should be explored through an examination of trait and nomological validity.

Trait validity involves the consideration of (a) convergent validity or the testing for the convergence across different measures of the same behavior and (b) discriminant validity or testing for the divergence across different measures of related but conceptually distinct behaviors. Nomological validity can be assessed by (a) investigating both the the-

oretical relationships between different constructs and (b) the empirical relationship between different measures of those different constructs (Peter, 1981). The procedures involved in assessing the construct validity of the strategy and executive characteristics constructs are described below.

Strategy Construct: Chapters II and III presented the conceptual and operational definitions and operationalizations of the three theory based measures that would be summed to construct a continuum describing the strategic orientation of an organization. To briefly recapitulate, the measures were: selling expenses per dollar of sales, research and development expenses per dollar of sales and fixed assets per employee. High values on the first two measures were expected for firms pursuing a Prospector strategy, as they describe the entrepreneurial dimension that is emphasized in this strategy. Defender organizations, on the other hand, were expected to have low values on these measures as they operate in narrow and stable domains and focus on efficiency rather than domain expansion. However, high fixed assets per employee was expected to characterize a Defender orientation as this measure has previously been found to capture the efficiency dimension crucial to its focus. Theoretically, convergence was expected between selling expenses per dollar sales and research and development expenses per dollar of sales, and divergence was expected between these measures and fixed assets per employee. Therefore, the continuum could be created by adding the two measures of the entrepreneurial dimension and the inverse of the measure depicting the efficiency dimension.

A basic assumption in the creation of the strategic orientation continuum is unidimensionality. Thus, it was necessary to determine whether the theoretically defined measures

did indeed capture different aspects of the external/internal dimension. This was assessed through the performance of a factor analysis on the three measures.

The resulting factor solution (see Table 4C) revealed two principal factors. Selling expenses per dollar of sales and research and development expenses per dollar of sales both loaded very highly on the first factor (.99), while fixed assets per employee loaded highly on the second factor (.93). These results are consistent with the theoretical literature which states that marketing and research expenditures measure the external orientation of an organization while assets per employee is considered to be indicative of the internal orientation.

Table 4C
Results of Factor Analysis Performed on Strategy Variables

n = 224

Variable	Factor 1	Factor 2
FASSEMP		.93185
SELLSAL	.99261	
RDESAL	.99434	

FASSEMP = Fixed Assets per Employee

SELLSAL = Selling Expenses per Dollar of Sales

RDESAL = Research and Development Expenses per Dollar of Sales

To assess the strength and direction of the interrelationships between the measures of strategic orientation, a correlation analysis was performed. As depicted in Table 4D, the correlations between selling expenses per sales dollar and R&D expenses per sales dollar revealed extremely high convergence through an almost perfect positive linear relationship ($p = .985$, $p < .0001$). This is accordant with the contentions of Miles and Snow (1978) which state that these are internally consistent characteristics. Prospectors are expected to have the highest scores on both these measures as marketing and R&D form the basic thrust of their strategy. In contrast, Defenders who focus on internal activities are expected to have the lowest scores.

In a cross-industry study of the Miles and Snow (1978) typology using the PIMS data base, Hambrick (1983) found that higher fixed assets per employee was a distinguishing characteristic of Defender organizations. He described this finding as being consistent with Miles and Snow's (1978) own observations that Defenders had the greatest focus on efficiency among the three strategy types. Thus based on prior empirical observation, it was expected that this measure would correlate negatively with the measures reflecting the entrepreneurial focus of organizations. However, this was not the case in the present study. As shown in Table 4D, there were insignificant correlations between fixed assets per employee and R&D expenses per sales dollar and selling expenses per sales dollar. The divergence in results between the two studies hamper the nomological validity of this measure. Therefore, it was also dropped.

Summary: The correlation analysis of the three original measures intended to describe the strategic orientation construct, resulted in the elimination of one measure. The two remaining measures namely, selling expenses per sales dollar and R&D expenses per sales dollar exhibited the predicted internal consistency and convergent validity. Both

measures are embedded in theory and have been found to be construct valid in previous studies utilizing or testing the Miles and Snow (1978) typology (Hambrick, 1983; Snow & Hrebiniak, 1980). Therefore, only these two measures were used in further analysis to determine the strategic orientation of organizations.

Table 4D
Correlation Matrix for Measures of Strategic Orientation

Pearson Correlation Coefficients / 1-tailed Significance / n = 224

	FASSEMP	SELLSAL	RDESAL
FASSEMP	1.000 p=		
SELLSAL	-.0098 p= .439	1.000 p=	
RDESAL	.0016 p= .491	.9850 p= .0001	1.000 p=

FASSEMP = Fixed Assets per Employee

SELLSAL = Selling Expenses per Dollar of Sales

RDESAL = Research and Development Expenses per Dollar of Sales

Executive Characteristics: Earlier, five measures of the executive characteristics construct were described and justified on the basis of existing empirical and theoretical literature. These measures were - age, level of education, functional background, and tenure in the organization of the CEO and whether he or she had been promoted from within the organization or recruited from outside. Each of these dimensions was also linked with specific thrusts of the Prospector and Defender strategies. Consistent with the emphasis on innovation of the Prospector strategy, it was expected that the CEO's of these firms would be younger, have higher levels of education, output oriented functional backgrounds shorter tenures in their positions as well as the organization. For Defenders the opposite would be true.

The correlation analysis revealed that the measures did in fact converge and diverge in the theoretically predicted directions (see Table 4E). As expected, age of the CEO, tenure in the company and tenure in the position showed a significant positive correlation ($p < .0001$). Level of education had a low negative correlation with CEO age and organization tenure, but this relationship was not statistically significant. Thus, it can be inferred that the three of the four items that described the CEO characteristics construct using an interval scale possess trait and nomological validity. Although level of education had an insignificant correlation with the other variables, this correlation was in the predicted direction. Further, since this variable had never been used in previous empirical efforts, further investigation of this variable is warranted. The other two variables (functional background and inside/outside promotion) were measured using a nominal scale and therefore were not included in the correlation analysis.

Table 4E
Correlation Matrix for Measures of Executive Characteristics

Pearson Correlation Coefficients / 1-tailed Significance / n = 150

	CEOAGE	COTEN	POSTEN	EDUCLEV
CEOAGE	1.000 p=			
COTEN	.5523 p=.000	1.000 p=		
POSTEN	.5510 p=.0001	.8084 p=.0001	1.000 p=	
EDUCLEV	-.0622 p=.253	-.0174 p=.426	-.0043 p=.482	1.000 p=

CEOAGE = Age of CEO

COTEN = Tenure in Company

POSTEN = Tenure in Position

EDUCLEV = Level of Education

Determining Strategic Orientation

As explained in Chapters II and III, strategic orientation was conceptualized as a continuum with Prospector-like and Defender-like firms occupying the two extremes. In order to operationalize this continuum, the two measures comprising the strategic orientation construct (research and development per dollar of sales and selling expenses per dollar of sales) were summed and arrayed in ascending order. Thus the firms having the highest combined score can be described to be the most Prospector-like as Prospectors are expected to place the greatest emphasis on innovation and market development. Firms having the lowest summed scores can then be described as the least Prospector-like or the most Defender-like.

According to Miles and Snow (1978) all three viable strategies namely, Prospector, Defender and Analyzer, will be found in every industry setting. This assertion has been subsequently validated by empirical research in multiple industries (see for example, Snow and Hrebiniak, 1980) However, there is no research that details the numerical distribution of the three strategies in a particular industry setting. In light of this problem, the top 25% (firms having the lowest summed score) and the bottom 25% (firms having the highest summed score) of the firms were respectively denoted as the most Defender-like and the most Prospector-like. This process resulted in two sets of 56 firms each that were selected for further testing. Nevertheless, it is recognized that this process can result in classification errors on the margin. In other words, firms having the highest summed score in the Defender-like sample and firms having the lowest summed score in the Prospector-like sample could in fact be pursuing a hybrid or Analyzer strategy.

Further, firms that have the lowest summed score in the Defender-like sample could also be Reactors, or those organizations that have no clearly articulated strategy.

Validating the Typing of Firms

To confirm that the two groups were indeed statistically different in the theoretically predicted manner, two steps were taken. First they were compared (using a one-tailed paired t-test) on the ratio used to distinguish them. This test revealed that the Prospector-like group had significantly higher selling and research and development expenses than the Defender-like group ($p < .0001$) (see Table 4F).

To validate the classification a non-random sub-sample (firms on whom the data were available) of the Prospector-like and Defender-like organizations were then compared using several theoretically defensible measures. A brief description of each of these measures, their relevance and the results obtained in the comparison are provided below. A summary of the results from the validation procedures can be found in table 4F.

Net Sales per Employee: This ratio describes an organization's ability to produce and distribute goods efficiently. Since the Defender strategy is geared toward the maximization of efficiency, it was predicted that the Defender-like group would have a higher score on this measure than the Prospector-like group. The results of the paired t-test confirmed this expectation as the Defender-like group was found to be significantly more efficient ($p < .0001$) than the Prospector-like group.

Total Number of Products: This measure was designed to capture the breadth of an organization's domain. According to Miles and Snow (1978) Defenders focus on narrow

and stable domains and target product development toward extending current product lines. Prospectors, on the other hand, have broad and continuously expanding domains and are characterized by "the systematic addition of new products or markets" (Miles and Snow, 1978, p. 56). Thus, it was expected that firms belonging to the Prospector-like group in the sample would have a greater number of product offerings than their counterparts in the Defender-like group, despite the fact that the latter category of firms were on the average, much larger. Consistent with this expectation, it was found that Prospector-like firms had more than twice as many products than Defender-like firms.

Number of New Products per Product Line: This ratio describes the number of new products introduced by an organization during the 1987-88 fiscal year, in each of its product lines. According to Hambrick (1983), new product activity can be inferred to be a distinguishing characteristic of the Prospector-type organization which grows through the introduction of innovative new products or the scouting of new markets. This conclusion is consistent with the arguments of Miles and Snow, (1978), who describe Prospectors as the harbingers of change in an industry. Based on these contentions it was predicted that Prospector-like firms would exhibit greater scores on this ratio than Defender-like firms. The findings upheld this prediction and showed that Prospector-like organizations exhibited one and one-half times the new product activity of their Defender-like counterparts.

Number of R&D Employees per Manufacturing Employee: This final validation measure was designed to detect the relative importance placed by Prospectors and Defenders on the research and production processes. This measure is considered appropriate in the context of the electronic computing equipment industry which is well automated and therefore not very labor intensive.

According to Miles and Snow (1978), Defenders place primary emphasis on routinized production mechanisms and standardized labor tasks. Conversely, Prospectors regard technological processes as disposable and place much greater emphasis on "people who have a variety of skills and can exercise judgement in selecting which skills to apply to a given situation" (Miles & Snow, 1978, p.59). Therefore, it can be concluded that Prospectors who rely on innovation to spur growth, will have a greater proportion of research personnel, while Defenders who focus inward, have greater numbers of manufacturing personnel. As indicated in table 4F, the comparison of the two groups on this ratio revealed results remarkably consistent with the theory. Prospector-like firms had almost five times as many R&D employees per manufacturing employee than Defender-like firms.

Table 4F
Results of One-tailed Paired t-Tests for Differences Between
Prospector-like and Defender-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
SGARDE	Prospector	56	.6375	.189	p < .0001	Yes
	Defender	56	.2451	.058		
NSEMP	Prospector	54	100460	34753	p < .0001	Yes
	Defender	52	120195	64567		
TOTPROD	Prospector	17	27.41	49.6	p < .0001	Yes
	Defender	17	10.47	6.7		
NEWPROD	Prospector	21	1.57	1.29	p < .0300	Yes
	Defender	19	1.07	0.77		
RDMFGEM	Prospector	11	1.28	1.00	p < .0001	Yes
	Defender	08	0.27	0.21		

SGARDE = Selling Expenses per Sales Dollar + R&D Expenses per Sales Dollar

NSEMP = Net Sales per Employee

TOTPROD = Total Number of Products

NEWPROD = Number of New Products per Product Line

RDMFGEM = Number of R&D Employees per Manufacturing Employee

As a final test of the internal consistency of the two groups a random sample of five Prospector-like firms and five Defender-like firms were chosen for further qualitative analysis. Annual Reports, Form 10-K reports, CEO's letter to the share holders, press analysis and business descriptions on each of these firms were content analyzed. Attention was directed toward assessing the market posture of these organizations. It was found that firms typed as Prospector-like consistently addressed issues of domain expansion and new-product development. On the other hand, Defender's focussed on maintaining efficiency through vertical integration and paring down expenses. Thus there was no evidence indicating that the classification of the groups was erroneous.

Summary: In the above analysis four objective-secondary measures were used to validate the classification of firms into Prospector-like and Defender-like categories. These measures were designed to capture different aspects of the internal/external (efficiency/effectiveness) dimension through the comparison and evaluation of diverse activities such as emphasis on research, achievement of efficiency, rate of new product introduction and product line breadth. In each case the results were in the theoretically predicted direction and highly significant. These results were further bolstered by a qualitative analysis. Thus it can be concluded that the classification of firms by strategy type was reasonably accurate.

Refinement of the CEO Characteristics Construct

Most of the data on executive characteristics had been collected prior to the classification of firms into the two groups. However, unlike the strategy data, this information

was less than complete. Thus, once the final sample of firms was selected, questionnaires requesting factual demographic data was sent to the CEO's of each of the 112 firms. A copy of the cover letter and the enclosed questionnaire is presented in Appendix A. This effort served two purposes: (a) it supplemented the data collected from secondary sources and (b) it was a check of the reliability of the data in these sources. Three weeks after the mailing, 44 (40%) questionnaires had been completed and returned. They provided no evidence that the data collected previously from the objective-secondary sources were imprecise or unreliable.

Before embarking on the hypothesis testing, functional background and executive origin had to be aggregated into two mutually exclusive categories namely throughput (process) functions versus output functions and inside promotion versus external recruitment. Functional background was defined as the functional area in which the CEO had spent the most years. Previous empirical and theoretical literature was relied upon to accurately classify this dimension. Thus CEO's with backgrounds in accounting, finance, human resources, information systems, engineering, manufacturing, operations, and production were denoted as having input (process) oriented skills. In contrast CEO's with skills in research and development, computer engineering (product engineering), and marketing were classified as having output (product or market) oriented skills. After this process, one functional background namely, management remained to be classified. According to the theory management has alternatively been described as both output and throughput oriented (Miles & Snow, 1978; Snow & Hrebiniak, 1980). It is an unarguable fact that management skills are essential to both the throughput and output activities. Lacking a theoretical justification to assign this function to one or the other categories, wherever possible, the second functional background (function where CEO spent the next most amount of time), was used. In those few cases where this informa-

tion was not available, the management function was coded as an 'X'(both process and output).

To determine whether the CEO had been promoted from within the organization or recruited from outside, the following process was used. If the CEO had spent a minimum of five years in the organization before attaining his/her present position, it was considered an internal promotion. When this criteria could not be met, it was denoted to represent outside recruitment.

Test of Hypothesis 1

The general form of Hypothesis 1 was that:

CEO's of firms pursuing Prospector strategies will have significantly different demographic profiles than the CEO's of firms pursuing Defender strategies.

In order to test this hypothesis it was first broken up into seven operational sub-hypotheses, each describing a different dimension of the CEO profile (see Chapter III). Then, the CEO's of the Prospector-like group and the CEO's of the Defender-like group were compared on each of these dimensions. The following sections briefly describe the methods used and results obtained from the test of each sub-hypothesis.

Hypothesis 1a: The CEO's of Prospector firms will be younger than the CEO's of Defender firms.

This hypothesis was tested by contrasting the average age of the CEO's of Prospector-like and Defender-like firms through a paired one-tailed t-test. As Table 4G demonstrates, the CEO's of Prospector-like firms were significantly younger than the CEO's of Defender-like firms ($p < .1$). Thus, this hypothesis was supported.

Table 4G
Results of One-tailed Paired t-Tests for Differences in
Age of CEO between Prospector-like and Defender-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
CEOAGE	Prospector	50	48.9	7.0	p < .1	Yes
	Defender	53	52.4	8.4		

CEOAGE = Age of CEO

Hypothesis 1b: The CEO's of Prospector firms are more likely (than the CEO's of Defender firms) to have backgrounds in output-functions such as research and development, marketing, and product engineering.

Hypothesis 1c: The CEO's of Defender firms are more likely (than the CEO's of Prospector firms) to have backgrounds in throughput-functions such as process engineering, production, finance and accounting.

As mentioned earlier, functional background was coded into two mutually exclusive and exhaustive categories namely throughput and output functions. Thus a non-parametric test, the Chi-square or goodness of fit test was performed to determine whether strategic orientation and functional background were statistically related. As predicted, Prospector-like firms had CEO's who were more likely to have backgrounds in output functions ($p < .01$), and Defender-like firms had a significantly greater proportion of CEO's with experience in throughput functions ($p < .001$). These results are presented in Tables 4H and 4I. Thus, both these hypotheses were supported.

Table 4H
Results of Chi-Square Test of Relatedness for the
Relationship Between Functional Background of CEOs and a
Prospector-like Strategy

n = 32

Functional Background	No. of CEOs (% of total)	Chi-Square	p	Hypothesis Supported
Output	77.4	9.32	p < .01	Yes
Throughput	22.6			

Table 4I
Results of Chi-Square Test of Relatedness for the
Relationship Between Functional Background of CEOs and a
Defender-like Strategy

n = 43

Functional Background	No. of CEOs (% of total)	Chi-Square	p	Hypothesis Supported
Output	10	25.6	p < .001	Yes
Throughput	90			

Hypothesis 1d: The CEO's of Prospector firms will have shorter tenures than the CEO's of Defender firms

To test this hypothesis, the mean organizational tenure of the CEO's of both Prospector-like and Defender-like firms was compared using a paired one-tailed t-test. As shown in Table 4J, CEO's of Prospector-like firms had significantly lower tenures than the CEO's of Defender-like firms ($p < .001$). In a different but related test of this hypothesis the number of years that each group of CEO's had spent in their current position was also contrasted. Once again, the CEO's of the Prospector-like firms were found to have significantly lower tenures ($p < .003$).

Table 4J
Results of One-tailed Paired t-Tests for Differences in CEO Tenure
between Prospector-like and Defender-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
COTEN	Prospector	32	8.75	6.1	p < .0001	Yes
	Defender	43	14.09	10.5		
POSTEN	Prospector	32	7.1	5.9	p < .003	Yes
	Defender	44	11.06	9.6		

COTEN = Tenure in the Company

POSTEN = Tenure in the Position of CEO

Hypothesis 1e: The CEO's of Prospector firms have higher levels of education than the CEO's of Defender firms.

Due to the highly technical skills required in the electronic computing equipment industry, 93% of the CEO's on whom data was available had four year college degrees. Among the CEO's of Prospector-like firms, 57% had masters degrees, 14% had Ph.D.'s and only 3% did not have any college degrees. Among the CEO's of Defender-like firms, 56% had a masters degree, 7% had a Ph.D and 7% had no college degree.

A one tailed paired t-test was used to test for statistically significant differences in the mean level of education of the CEO's of the two groups. As shown in Table 4K, the CEO's of Prospector firms had significantly ($p < 0.05$) higher levels of education than their counterparts in Defender-like firms. Thus, this hypothesis was supported.

Table 4K
Results of One-tailed Paired t-Tests for Differences in Level of
Education of CEOs between Prospector-like and Defender-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
EDUCLEV	Prospector	35	17.92	2.1	p < .05	Yes
	Defender	40	17.43	2.9		

EDUCLEV = Years of Formal Education of the CEO

Hypothesis 1f: The CEO's of Defender firms are more likely to have been promoted from functional areas within the organization.

Hypothesis 1g: The CEO's of Prospector like firms are as likely to be promoted from within as they are to be recruited from outside the organization.

The null form of hypothesis 1f is that executive origin is independent of strategic orientation. This form of the hypothesis was tested through a Chi-Square test and failed to be rejected. Therefore hypothesis 1f was not supported (Table 4L).

Hypothesis 1g was also tested using a Chi-Square test. As expected, the test confirmed that the CEO's of Prospector-like are as likely to be promoted from within the organization as they are to be recruited from outside (the null form was rejected - see arguments presented in chapter 2). The results of this test are presented in table 4M.

Table 4L
Results of Chi-Square Test of Relatedness for the
Relationship Between CEO origin and a Defender-like Strategy

Origin	No. of CEOs (% of total)	Chi-Square	p	Hypothesis Supported
Outside	58	.46	$p < .5$	No
Inside	42			

Table 4M
Results of Chi-Square Test of Relatedness for the
Relationship Between CEO origin and a Prospector-like Strategy

Origin	No. of CEOs (% of total)	Chi-Square	p	Hypothesis Supported
Outside	69	1.92	$p < .2$	Yes
Inside	31			

Test of Hypothesis 2

The general form of Hypothesis 2 was that:

Organizations that achieve a match between their strategic orientation and CEO profiles will perform better than other organizations with the same strategic orientation.

Before the operational forms of this hypothesis could be tested, several considerations had to be taken into account. First, it was necessary to develop "ideal-type" profiles for the CEO's of Prospectors and Defenders. Second, the concept of "fit" had to be operationalized, and finally, the use of separate performance measures for the two different strategies had to be statistically justified. The steps undertaken to accomplish these objectives are defined below.

Development of "ideal-type" CEO profiles

It was noted previously, that executive characteristics were measured at the end of 1984 and strategy and performance were measured at the end of 1986 and 1987. This was necessary to counter the argument that the strategic choices made by the CEO would take time to impact the strategy and performance of the organization. At the time that strategy and performance were measured, each CEO had been in office for a minimum of two years although over 85% of them had been in office for longer periods.

According to the theory presented in Chapter II, it was expected that the CEO's of Prospector-like firms would be younger, have higher levels of education, and shorter te-

nures in the organization than their counterparts in Defender-like firms. They were also more likely than Defender CEO's to have output rather than throughput oriented functional backgrounds. These contentions were largely supported in Hypothesis 1.

Thus, prior theoretical and empirical evidence was combined with the specific industry context to define the CEO profiles. Table 4B presented the mean scores on each of the three interval variables for the CEO's of all the firms in the computer industry (population= 224) on whom information was available. Based on these means the "ideal-type" profiles for Prospector-like (Profile P) and Defender-like firms (Profile-D) were constructed. CEO's who were younger than the mean age of all CEO's in the industry were assigned a 'P', and CEO's who were older were assigned a 'D'. This process was repeated for the other three metric variables (tenure in organization, tenure in position, and level of education). Using the same logic, CEO's who had output oriented functional backgrounds, were given a 'P', and those having process oriented skills, a 'D'. Thus, an index of CEO type was developed. The "ideal-type" Prospector CEO would therefore have an index of 'PPPPP' while the "ideal-type" Defender CEO would have an index of "DDDDD". Although several CEO's were found to have the perfect index (PPPPP; DDDDD), there were many who had mixed indices (for example: PPPPD, PPPDD, PPDDD, PDDDD and so on).

Defining the Fit

Prior discussions described the process by which the strategic orientations of organizations in the sample was determined. Each Prospector-like firm was now denoted with a 'P' and each Defender-like firm with a 'D'. When a match between firm type and at least three characteristics of the CEO-type index was achieved a fit was defined to exist. For

example, if a 'P' type firm had a CEO index of 'PPPDD', 'PPPPD', or 'PPPPP' then it was determined that there was a fit between executive characteristics and strategic orientation. Three characteristics out of five were chosen to justify that the CEO had more characteristics that were theoretically consistent with one specific strategy type than the other.

Measuring Performance

Hambrick (1983) empirically demonstrated that Prospectors had higher levels of performance on market based measures and Defenders had superior performance on financial measures. These findings are consistent with the individual goals of the two strategies. While Prospectors strive to expand their domains, Defenders focus on maximizing their efficiency. Thus, there are strong theoretical and empirical arguments for incorporating the goals of these strategies in the assessment of organizational outcomes.

Testing the Fit

Hypothesis 2a can now be stated in its operational form:

Hypothesis 2a: Prospector firms led by Profile P CEO's will have higher sales growth rates than all other Prospector firms in the industry.

This hypothesis was tested by comparing the average sales growth (86-87) of Prospector-like firms led by Profile P CEO's and Profile D CEO's. As shown in Table 4N, paired t-tests comparing the two sets of firms revealed that organizations achieving a fit (led by Profile P CEO's) had significantly higher levels of sales growth ($p < .002$) than those

firms that failed to achieve such a fit (led by Profile D CEO's). Thus, this hypothesis was supported.

Table 4N
Results of One-tailed Paired t-Tests for Differences in Change in
Sales between Fit and Non-fit Prospector-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
CHSALE87	Fit	24	.1855	.454	p < .002	Yes
	Non-fit	5	-.0110	.074		

CHSALE87 = Change in Sales from 1986 to 1987

FIT = Prospector-like firms led by Profile P CEOs

NON-FIT = Prospector-like firms led by Profile D CEOs

Hypothesis 2b: Defender firms led by Profile D CEO's will have higher ROI than all other Defender firms in the industry.

The test of this hypothesis involved comparing the average (86-87) in ROI for Defender-like firms led by Profile D CEO's and those led by Profile P CEO's. As shown in Table 4O, Defender-like firms led by Profile P CEO's (no fit) outperformed those led by Profile D CEO's (fit) ($p < .0001$). Thus, this hypothesis was not supported.

Table 4O
Results of One-tailed Paired t-Tests for Differences in ROI
between Fit and Non-fit Defender-like firms

Variable	Group	n	Mean	Standard Deviation	p	In Expected Direction
ROI8687	Fit	14	-.6486	2.48	p < .0001	No
	Non-fit	20	.0935	2.429		

ROI8687 = Return on Investment for 1986 + 1987
FIT = Defender-like firms led by Profile D CEOs
NON-FIT = Defender-like firms led by Profile P CEOs

Summary

This chapter discussed the methods of data collection, data purification and issues of precision, reliability and validity. The methodology used to test each hypothesis was reviewed and the results of the tests were also presented. These results of the tests of Hypotheses 1 and 2 are summarized in Tables 4P and 4Q respectively. In the next chapter the test results will be discussed and related to the theoretical literature presented in Chapter II. The significance of this research effort and the limitations associated with it will also be addressed.

Table 4P

Summary of Results from the Test of Hypothesis 1

Hypothesis	Supported
H1a: CEOs of Prospectors will be younger than CEOs of Defenders	Yes
H1b: CEOs of Prospectors are more likely to have backgrounds in output functions	Yes
H1c: CEOs of Defenders are more likely to have backgrounds in throughput functions	Yes
H1d: CEOs of Prospectors will have shorter tenures than the CEOs of Defenders	Yes
H1e: CEOs of Prospectors will have a higher level of education than the CEOs of Defenders	Yes
H1f: CEOs of Defenders are more likely to have been promoted from functional areas within the organization	No
H1g: CEOs of Prospectors are as likely to have been promoted from within as to be recruited from outside the organization	Yes

Table 4Q

Summary of Results from the Test of Hypothesis 2

Hypothesis	Supported
H2a: Prospector firms led by Profile P CEOs will have higher rates of sales growth than all other Prospectors	Yes
H2b: Defender firms led by Profile D CEOs will have higher ROI than all other Defenders	No

Chapter V: Discussion and Conclusions

Introduction

The goals of this study were to integrate and extend the fragmented theories and research results of prior literature examining the separate linkages between executive characteristics, strategy and performance. As indicated in Chapter II, previous research efforts have largely been limited to relatively theory-free examinations of simple bivariate relationships. In this study the empirical and theoretical knowledge gained from previous research was combined to develop a conceptually driven and theory based contingency model which maps a series of bivariate relationships into a more multivariate framework. The basic tenet of the model was that the fit or match between managerial profiles and organizational strategy would have a positive impact on performance. This model was subjected to an empirical test on a sample of firms from the computer and electronics industry at a single point in time.

In this chapter, the results of the hypothesis testing will be discussed and incorporated into the existing framework of upper echelon theory. The contributions of this effort will also be examined and related to the broader strategic management paradigm. Finally,

the limitations this study will be outlined and suggestions for future research in this area will be provided.

Hypothesis 1

The primary purpose of Hypothesis 1 was to establish differences on each of the five dimensions comprising the executive characteristics profile for the CEO's of firms pursuing diametrically opposite strategies. These differences were measured along demographic indicators, following Hambrick and Mason's (1984) argument that such measures adequately capture diversity in backgrounds, experiences and mindsets. The test of this hypothesis involved the comparison of characteristics using seven operational sub-hypotheses six of which was statistically supported at varying levels of significance acceptable for exploratory research. Thus, the CEO's of Prospector-like firms were found to be younger, have shorter tenures in the organization, higher levels of education and have a greater emphasis on output oriented skills than the CEO's of Defender-like firms.

The only sub-hypothesis that was not supported was the one that predicted that the CEO's of Defender-like firms are more likely to be promoted from inside the organization than to be recruited from outside (Hypothesis 1f). This hypothesis was derived from the theory presented by Miles and Snow (1978) which stated that the internally oriented, efficiency focussed Defenders would prefer leaders who were experts in the internal systems of the firm. However, the test of this hypothesis revealed that Defender-like organizations in the sample were equally likely to recruit CEO's from outside the firm as they were to promote them from within.

Post-hoc analysis showed that the majority of the CEO's of Defender-like firms, who had been recruited from outside, came from other organizations within the industry and had throughput-oriented functional backgrounds. Thus, it can be inferred that in this scenario, external recruitment is not necessarily inconsistent with the basic thrust of the Defender strategy.

Since hypothesis 1 was largely supported, it can be concluded that in this industry, different CEO profiles are associated with different strategies. Further, it was demonstrated that these profiles are consistent with the basic objectives of each strategy. To illustrate this conclusion, the next section will provide qualitative and detailed profiles of the founders and CEO's of a Prospector-like and a Defender-like firm.

The CEO-Strategy Match - An Example

In a 1984 book called The Computer Entrepreneurs, Levering, Katz and Moskowitz profiled 65 computer entrepreneurs whom they described as responsible for shaping the computer industry of today. They classified these CEO's into groups such as machine makers, software wizards, innard engineers, shopkeepers, information moguls, moneybags and industry gurus etc. The information for the following profiles of Jugi Tandon (innard engineer) of Tandon Computers and Dustin Heuston (machine maker) of Wicat Systems was largely obtained from this book and supplemented with other data from company reports and industry publications. Before presenting the profiles of these CEO's it must be noted that in the previous analysis, Tandon computers was defined as a Defender-like firm and Wicat Systems, a Prospector-like firm.

Jugi Tandon - Profile D: Jugi Tandon who was born and raised in Barnala, India came to the United States as an 18-year old to study mechanical engineering at Howard University. Upon completion of his bachelors degree he moved West, and got his M.B.A. at Santa-Clara University (majoring in finance) supporting himself by designing office building heating systems. He then applied for and received a scholarship at Kansas State University where he worked on a masters degree in mechanical engineering. After that, he returned to California and worked as an engineer first for Beckman instruments and then for IBM.

Since it had always been his ambition to return to India, he did. He worked at IBM, India for a year but since the plant was not very advanced, he felt unchallenged, left India and returned to the U.S. and began working for Memorex. He stayed with Memorex for five years working mostly on on magnetic heads for floppy disk drives. During this time, when entrepreneurial computer-ventures were sprouting out all around him, he made several attempts to leave and start his own company, but was always lured back to Memorex with additional bonuses and stock-options.

In 1975, with \$7000 in savings and a bonus from some real estate ventures Tandon began the company that bears his name. With his wife soldering the wires and cutting cables, he worked in a little building, perfecting the magnetic head for floppy disk-drives. His strategy was to make a good product that was less expensive than the competition. To achieve this low-cost high volume strategy, Tandon focussed on vertical integration, making 80 percent of the products internally, rather than contracting them out thus ensuring a steady stream of components and eliminating suppliers markups.

Now Tandon has expanded his operations to encompass the range of a single product-line, making hard and floppy disk-drives, and claims to be the world's largest producer

of floppy disk drives. His company has a stable set of 480 customers, the largest of which is IBM. In order to keep costs low, he owns factories in Third World countries such as his native India where he pays workers \$38 a month to manufacture Tandon Corporation's disk drives.

This Defender-like strategy, designed around his background in finance and mechanical engineering, focussing on a stable niche of the market and emphasizing efficiency in all operations, has paid off for Jugi Tandon. By 1983, a mere eight years later, sales had grown to \$303 million and his personal investment of under \$10,000 is now worth over \$100 million.

Dustin Heuston - Profile P: Dustin Heuston, the founder and CEO of Wicat systems has a style and background that is diametrically opposite from the pragmatic and technical one of Jugi Tandon. The son of an advertising executive, Heuston was born and raised in New York. After earning an undergraduate degree in English from Hamilton college, he served in the Navy for three years and subsequently got a job teaching English at Brigham Young University in Utah. Finding BYU too "right-wing" for his moderate tastes, he moved back east to teach at Pine Manor, a women's junior college near Boston and work on his doctorate in English.

Unable to earn enough money to support a family of six children, Heuston subsequently began to get involved in administration and then began the Spence School, an exclusive New York City school for girls. When a few college-bound students expressed a desire to work with computers, Heuston himself started investigating their efficacy. He was so impressed, that he bought a \$200,000 system for the school and then devoted the next

five years studying the use of computers and working up to 18 hours a day to train himself in electronics.

In 1978 Heuston moved back to Utah to take advantage of computer hardware and software research at BYU. There he raised \$300,000 from his own savings and from private foundations and individuals to form Wicat (World Institute for Computer-Assisted Teaching) Systems with three specific goals in mind: (1) Manufacture computer hardware; (2) Offer computers and software for industrial military training and (3) Develop software programs for world literacy and education. Wicat Systems was the first producer of powerful, 16-bit microcomputers based on the Motorola 6800 chip for use by businesses and school systems.

Wicat Systems now designs, manufactures, markets and services a broad line of microcomputer systems for business education training and engineering applications. In the training market Wicat Systems provides aviation training to commercial airlines such as TWA, Air Canada, Alitalia, Swissair etc., computer-based training (CBT) to the government/military market and other compatible services to firms in industries as diverse as telecommunications, utilities etc. The company's success in these segments is attributable to the fact that they develop hardware and software suited to the specific training needs of their clients. In the education market the company sells computers such as the Hydra which has 30 terminals that can fit in a classroom.

Having worked with educators and researchers for so many years, Heuston realizes the value of product research and innovation. Consequently, he has over 40 Ph.D's on his staff of 500 employees who design and develop new products for continuously expanding domains markets. This Prospector-like strategy is accompanied by massive investments

in research and development which have paid off. In 1987, Wicat systems had total revenues of \$11,304,000.

Conclusion: From the above discussion, it is apparent that the strategy of an organization and the backgrounds and experiences of the CEO are closely linked. Since the two CEO's who were profiled were also the founders, it can be argued that the organizational strategies were in fact a product of these experiences and competences. However, further research is necessary to confirm this argument and to determine whether established organizations select their CEO's on the basis of the strategy that is already in place, or whether the CEO's in fact determine the strategic direction that the firm will pursue.

Hypothesis 2

The successful test of Hypothesis 1 set the stage for the test of Hypothesis 2 which predicted that a fit between strategic orientation and organizational strategy would be associated with better performance. This prediction was derived from theory that suggests that the backgrounds and skills of top management must be consistent with the distinctive competences of the organization in order for the organization to perform well. The hypothesis was operationalized by breaking it into two sub-hypothesis which incorporated the different performance goals of Prospector and Defender organizations.

As indicated in Chapter IV this hypothesis was only partially supported. As predicted, Prospector-like organizations led by Profile P CEO's (match) performed better than those led by Profile D CEO's (no match). However, in the case of Defender-like firms,

the reverse was true. In other words, Defender-like organizations led by Profile P CEO's (no match) performed better than those led by profile D CEO's (match).

This was a surprising finding in light of the fact that in a previous study in the oil industry (Thomas and Ramaswamy, 1989), both Prospector-like and Defender-like organizations that achieved a fit between strategic orientation and CEO profiles outperformed their non-fit counterparts on several different measures of organizational performance. This finding can perhaps be explained by considering the specific context of the computer industry. In only 40 years, this industry has become the third largest in the U.S., after only automobiles and oil. It is an extremely competitive industry that is still evolving in an environment that can be described as turbulent (Bourgeois & Eisenhardt, 1987). Consequently, it can be argued that this industry does not have accepted dominant technologies and product designs like many of the other more established and mature industries (e.g., oil refining, automobiles, aircraft manufacturing etc.). This key difference may be responsible for the relatively higher levels of product/market focus exhibited by firms in this industry. This argument is consistent with Porter's (1980) observation that the initial stages of industry evolution (introduction and growth stage) bring about dominant technologies. Therefore, firms need to be more sensitive to market needs during these stages. Once dominant technologies are in place, efficiency goals may be pursued by standardizing production processes, minimizing environmental scanning, etc.

Thus in this evolving industry context, even organizations pursuing efficiency strategies need to have reasonably high levels of product-market focus to be successful. It is this orientation that is probably being reflected in the CEO profiles of successful Defender organizations.

Contributions and Limitations of the Study

This study makes several contributions in the advancement of research in the upper-echelon or strategic leadership perspective. However, like every research effort, it is also subject to various limitations. These contributions and limitations can be characterized as theoretical and methodological. The following sections will delineate some of the major theoretical and methodological contributions and limitations of this research study.

Theoretical Contributions and Limitations

After many years of focussing exclusively on environments, structures, processes and content of strategies, researchers in this field have returned to the study of individuals formally charged with directing their organizations (Hambrick, 1988). The logic for such endeavors stems from the upper echelons perspective (Hambrick & Mason, 1984) which states that the organization is a reflection of its top managers, and if we want to improve our understanding of why organizations perform as they do, we must consider the experiences and values of managers as an important source of variation.

However, as described in Chapters I and II, this area of research has been dominated by the study of numerous bivariate relationships that either examine the relationship between executive characteristics and strategy or executive characteristics and performance. Although the studies examining linkages between executive characteristics and strategy use some theory to justify their investigation, most of these research efforts use only one or two variables (such as age) to define the executive characteristics construct

and relate them to various situation specific strategies such as innovation and diversification. The studies that consider the impact of executive characteristics on performance have been relatively theory free relying on methodological refinements in regression equations to alternatively conclude that leaders have a significant or inconsequential impact on organizational performance. Taken as a whole, the latter class of studies have been inconclusive.

This research effort was designed to integrate and extend the current knowledge on these linkages. It consisted of two distinct steps. First, the organizations were divided into two groups based on their STRATEGIC ORIENTATION which includes an internally consistent set of organizational structures and processes. The CEO's of these two groups were then compared on five demographic dimensions to establish that different executive characteristics were indeed associated with different strategic orientations. Second, a contingency model stating that a fit or a match between executive characteristics and strategy would have performance implications was developed, tested and partially supported.

Thus, the first major theoretical contribution of this study was the integration of findings from prior research to develop a set of managerial attributes associated with two distinct strategic orientation profiles that are broadly applicable across varied industry settings and situations.

The partial support of the contingency model also represents a major theoretical contribution. This model is the first one in the literature to simultaneously consider the impact of the fit between executive characteristics and strategy on performance. Contrary to prior efforts that contend that managerial characteristics have an independent and direct impact on performance, this model highlights the significance of matching man-

agers to strategy, and reconciles two distinct research streams. Thus, this model provides a holistic framework for the study of top managers and their impact on organizational outcomes.

Evaluation of the Theory: In a recent paper delineating criteria for the evaluation of a good theory, Whetton (1989) summarizes four essential elements of a good theory. The theoretical contributions and limitations of this effort will be evaluated in the framework of these criteria.

The first consideration in this evaluation process is whether the theory is comprehensive and parsimonious. Since these are competing goals, the maximization of one necessarily means that the other goal cannot be completely achieved. This effort focussed on building profiles of CEO's that were associated with distinct strategic orientations. By conceptualizing both CEO characteristics and strategic orientation in terms of profiles of behavior, rather than individualistic and situation specific variables, and by incorporating all demographic dimensions of executive characteristics previously found significant, this theory is much more comprehensive than any other in the research stream. However, demographic variables only account partially for an individuals personality. Thus, the comprehensiveness of this construct could have been improved through the consideration of psychological and personality dimensions as well. The parsimoniousness of the theory was enhanced by limiting the constructs to executive characteristics, strategic orientation and performance. However, it is recognized that the theory could have been strengthened by the inclusion of other contextual factors through the consideration of industry factors (such as life-cycles and regulatory mechanisms) and organizational factors (such as age and size of the organization)

The next tasks of the theory builder are to describe how the factors are related and why they are related. Or in other words, to "add order to the conceptualization by explicitly delineating patterns...and provide a rationale that justifies the selection of factors" (Whetton, 1989). The contingency model (Figure 1.2) suggests that a fit between executive characteristics and strategy will positively impact performance. This proposition was derived from previous bivariate research that showed associative linkages between executive characteristics and strategy and performance. Since executive characteristics influence environmental perception, and therefore strategic responses executive characteristics impact strategy formulation. Similarly, drawing from normative theorists who suggest that different strategies emphasize different distinctive competences and have different organizational requirements, and the strategy literature which assumes that a well articulated and implemented strategy influences performance, it was argued that a fit between executive characteristics and strategy positively impacts performance. The inclusion of performance in the model also addresses the "complaint that performance measures have been under-utilized as dependent variables...which not only impedes the development of true contingency theory but threatens to undermine the very legitimacy of the field of organizational behavior" (Ginsberg & Venkatraman, 1985).

In developing the concept of a fit and providing a rationale for the linkage between executive characteristics and strategy, each dimension of the executive characteristics construct was theoretically linked to a specific dimension of organizational strategy. This theory was relied upon for the subsequent development of measures to capture each construct and to derive testable hypotheses. Thus, the model provided explanations for and descriptions of the linkages proposed.

The primary weakness of the theory and the empirical test, was the inability to predict causal directions for the relationship between executive characteristics and strategy. Thus, it is unclear whether specific executive characteristics contribute to the selection of a specific strategic posture or conversely, whether the successful pursuance of a particular strategy causes the selection of executives with a given profile.

Methodological Contributions and Limitations

Given the objective of theory building, the methodological goals of this endeavor were simplicity and accuracy rather than generalizability. Thus, the theoretically derived hypotheses were subjected to an empirical test in a single industry at a single point in time. Due to the synchronic nature of the empirical examination, no conclusions about causality could be made, and the generalizability of the results were severely limited.

Another potential limitation was the exclusive focus on the CEO. Current strategic management research suggests that the top-management team of an organization contributes substantially to the development of an organization's strategy and actively participates in the decision-making processes. Therefore, the results of this study might have been more significant if the entire dominant coalition had been used.

Finally, organizational strategy was operationalized as the extremes (Prospector and Defender) on a strategic orientation continuum. This approach forced the exclusion of many firms following hybrid strategies. Thus no light was shed on the relationship between executive characteristics, strategy and performance among these firms. With these limitations in mind, the methodological contributions of this research can now be discussed.

The primary methodological contribution of this study was the use of multiple sources of objective-secondary data combined with multiple measures for each of the key constructs. This signifies a contribution to the strategic management literature which has thus far been largely characterized by self-reported questionnaire data or single measure operationalizations of strategy and executive characteristics.

This study also enhances the understanding of the Miles and Snow (1978) typology in two important ways. It is the first one to actually test and support their contentions regarding the associations between managerial characteristics and strategic orientation. Researchers in the past (see for example, Smith, Guthrie & Chen, 1986) have taken this association as a given in their tests for the existence of the Prospector, Defender and Analyzer archetypes. This is also the first study (in this researchers knowledge) that uses multiple measures from secondary data to operationalize the Miles and Snow (1978) typology of strategic orientation.

Another contribution of this effort is the incorporation of several control mechanisms. Industry effects were controlled by using only a single industry. A recent investigation by Dess, Ireland and Hitt (1989) showed that only five of the forty most frequently cited works in strategic management were conducted in single industry settings. Since the industry setting is a proxy for a number of important characteristics of the organization's environment such as product life-cycles, capital investments, technology, regulation etc., (Snow & Miles, 1983) which affect managerial decision making, controlling for this type of variation is important in every strategic management study. Second, by ensuring a lag between the measurement of executive characteristics and strategy and performance, this study also accounts for the diachronic nature of these associations. Finally, the use of

different performance measures for the two groups of firms allows for the incorporation of strategy-specific goals in the research design.

Suggestions For Future Research

Although this study consolidates previous research and provides a framework for future empirical examinations of the phenomena, much more investigation is required for a fuller understanding of the relationships. Suggestions for future research focus on the development and refinement of this model through a consideration of theoretical and methodological issues. The theoretical issues suggest that environmental factors and organizational factors must be considered in extending the validity of this model and defining the boundary conditions of its applicability. The methodological discussion centers around issues of causality generalizability and triangulation.

Theoretical Issues

Environmental Factors: The consideration of environment is central to all strategic management research. The environment provides specific constraints and requirements that must be incorporated in the formulation of an organizations strategic responses. Specific environmental factors that could impact on the relationships postulated in the model include industry life-cycles and regulatory mechanisms.

Due to the different constraints placed on organizations operating in industries in different stages of evolution (Porter, 1980), the importance of various managerial attributes

can vary among industry contexts. Thus, the profile of managers in Prospector firms can differ from say, the railroad industry to the computer and electronics industry. The source and nature of this variation will be an interesting avenue for future research.

Some researchers (Snow & Hrebiniak, 1980), have demonstrated that the importance of strategy in regulated environments is minimal. They argue that since organizations have very limited choices, the strategy is no longer required. This logic can be extended to suggest that in these instances, the importance of managers is negligible. Thus, in these types of environments, managers are merely figureheads, and there would be no systematic relationship between managerial attributes and organizational responses. A test of the contingency model in this context can provide a confirmation of this logic.

Organizational Factors: Organizational factors can pose critical boundary conditions to the contingency model. The number of such factors that can mediate and moderate the postulated relationships are arguably infinite. Some of the more important factors that should be considered are discussed below.

The variable impact of top-management teams on strategy formulation and strategy implementation activities should be studied. Current theoretical evidence suggests that TMT's focus primarily on setting the strategic direction of the firm or formulating its strategy. However, empirical research thus far has focussed on demonstrating the link between strategy implementation and managerial attributes (see for e.g., Govindrajana, 1989). A potential avenue for future research in examining these issues is the study of managerial discretion (Hambrick & Finkelstein, 1987). It may be true that the CEO or the TMT is responsible for strategy formulation during the birth and growth stages of the organization (Boecker, 1987), but once systems are set in place, and a strategic di-

rection has been established, the CEO's are merely implementers and figureheads (Miller, 1986). If this is true, then the impact of a fit between managerial profiles and organizational strategy will vary across organizational life-cycles.

Other organizational factors that can impact the validity of the model are the size, centralization and diversification patterns of the organization. The Chief Executive will obviously have greater power and discretion in a small centralized organization. However, as the organization grows and patterns of strategic response get institutionalized this decision-making flexibility might decrease. In a large decentralized conglomerate pursuing unrelated diversification, the decisions of the SBU manager might have greater impact than those made by the CEO.

These factors should be included in future efforts to test the model. This process will facilitate the determination of the value added (to the explanatory power of the model) by each of the above environmental and organizational factors.

Methodological Issues

The above suggestions were provided primarily on a theoretical level. However, in operationalizing these suggestions, researchers must be sensitive to the issues of causality, generalizability and the triangulation of results. These issues and their importance are briefly highlighted below.

To clarify the causal relationships among the variables specified in the contingency model, longitudinal research designs focussing on the logical and temporal sequence of events are necessary. For example, a study that examines the characteristics of top-

management teams prior to, during and after strategic change or reorientation will contribute toward our understanding of whether the top-executives determine organizational strategy or whether the selection and recruitment of managers is dependent on a particular strategic orientation.

To improve the generalizability of the model, it should be tested in diverse industry contexts. Such tests will improve our knowledge of the moderating and mediating influences of industry contexts. Research designs that incorporate a variety of industry settings, and attempt the comparison of results across settings, should be encouraged.

Research in the future should also attempt triangulation of results through the use of multiple measures and methods. For instance, results obtained from the use of fine-grained measures from psychological-personality research and the demographic variables in this study will help us assess the efficacy of demographic surrogates. Similarly, comparisons of the effectiveness of clinical, ethnographic and empirical studies will be useful.

Conclusion

Hambrick (1988), predicts that strategic leadership will be the central thrust in the field of strategic management in the 1990's, as competitive strategy was in the 1980's. This study combined with the multitude of others that are emerging from different institutions and perspectives will provide a cohesive platform to test and understand the role of strategic leadership in organizational processes and outcomes. It is in this direction that this author now focuses her attention.

Bibliography

- Alutto, J.A., & Hrebiniak, L.G. 1975. Research on commitment to employing organizations: Preliminary findings on a study of managers graduating from engineering and MBA programs. Paper presented at the Academy of Management meetings, New Orleans, 1975.
- Ansoff, I. 1965. Corporate Strategy, New York: McGraw Hill Book Company.
- Ansoff, I. 1987. The emerging paradigm of strategic behavior. Strategic Management Journal, 8:501-505.
- Barnard, Chester. 1938. The Functions of the Executive, Cambridge, Mass: Harvard University Press.
- Becker, M. H. 1970. Reformulation and Extention of the Diffusion Model. American Sociological Review, 35: 267-304.
- Bourgeois, L.J. 1985. Strategic goals, perceived uncertainty and economic performance in volatile environments. Academy of Management Journal, 28: 548-573.
- Brinberg, D & McGrath, J.E. 1985. Validity and the research process, Beverly Hills, CA: Sage Publications.
- Bryson, J. & Kelley, G. 1978. A political perspective on leadership emergence stability and change in organizational networks. Academy of Management Review, 4: 713-727.
- Burns, T. & Stalker, G. M. 1961. The Management of Innovation, London: Tavistock Press.
- Business Week, 1980. Wanted a manager to fit each strategy, February 25: 166-173.
- Business Week, 1983. Turnover at the top, December 19: 104-106.
- Campbell, D. T. 1960. Recommendations for APA test standards regarding construct, trait or discriminant validity, American Psychologist, 15: 546-553.
- Campbell, D. T. & Fiske, D.W. 1959. Convergent and discriminant validation by the multitrait-multimethod matrix, Psychological Bulletin, 56: 81-105.

- Caplow, T. 1976. How to run any organization, New York: Holt, Rinehart & Winston.
- Carlson, R.O. 1961. Succession and performance among school superintendents Administrative Science Quarterly, 6: 210-227.
- Carlsson, G., & Karlsson, K. 1970. Age, cohorts and the generation of generations. American Sociological Review, 35: 710-718.
- Carlson, R.O. 1972. School superintendents: Career and performance. Columbia, Ohio: Merrill.
- Chandler, A. 1962. Strategy and structure, Harvard University Press.
- Changati, R. & Sambharya, R. 1986. Strategic orientation and upper echelon characteristics. Paper presented at Academy of Management meetings, Chicago, 1986.
- Changati, R. & Sambharya, R. 1987. Strategic orientation and characteristics of upper management. Strategic Management Journal, 8: 393-401.
- Channon, D. 1979. Leadership and corporate performance in the service industries, Journal of Management Studies, 16: 185-201
- Chen, M.J. & Smith, K.J. 1987. Samples used in strategic management research, Academy of Management Best Paper Proceedings, 47: 7-11.
- Cheng, J.L.C. & Kesner, I. 1988. Responsiveness to environmental change: The interactive effects of organizational slack and strategic orientation, Academy of Management Best Paper Proceedings.
- Child, J. 1972. Organization structure, environments and performance: The role of strategic choice. Sociology, 6: 1-22
- Child, J. 1974. Managerial and organizational factors associated with company performance. Journal of Management Studies, 11: 13-27.
- Chown, S. M. 1960. The Wesley rigidity inventory: A factor analytic approach, Journal of Abnormal and Social Psychology, 61: 491-494.
- Chronbach L. J. 1971. Test Validation. Educational Measurement, 2nd ed., R.L. Thorndike., ed., Washington D.C. American council on education, 443-507.
- Churchill, G.A. 1979. A paradigm for developing better measures of marketing constructs, Journal of Marketing Research, XVI: 64-73.
- Chung, K. H., Lubatkin, M., Rogers, R. C., & Owers J. E. 1987. Do insiders make better CEO's than outsiders? Academy of Management Executive, 1: 325-335.
- Collins, R. 1971. Functional and conflict theories of educational stratification. American Sociological Review, 36: 1002-1019.

- Cook, T.D., & Campbell, D.T. 1979. Quasi-experimentation: Design and analysis issues for field settings, Boston, Mass.: Houghton Mifflin. 70: 69-72.
- Cyert, R. M. & March, J. G. 1963. A behavioral theory of the firm. Englewood Cliffs, N. J.: Prentice Hall.
- Dalton, D.R., & Kesner, I.F. 1983. Inside/outside succession and organizational size: The pragmatics of executive replacement. Academy of Management Journal, 26: 736-742.
- Day, D.V., & Lord, R.G. 1988. Executive leadership and organizational performance: Suggestions for a new theory and methodology. Journal of Management, 14: 453-464
- Dearborn, D.C., & Simon, H.A. 1958. Selective perceptions: A note on the departmental identifications of executives. Sociometry, 21: 140-144.
- Donaldson, G. 1984. Managing Corporate Wealth, New York: Praeger Inc.
- Eisenstadt, S.N. 1959. Bureaucracy, bureaucratization, and debureaucratization Administrative Science Quarterly, 4: xxx-xxx.
- Galbraith, J.R. 1973. Designing complex organizations. Reading, Mass.: Addison Wesley
- Galbraith, J.R. & Nathanson, D.A. 1978. Strategy implementation: The nature of structure and process, West Publishing Company: New York.
- Ginsberg, A. 1984. Operationalizing organizational strategy: Toward an integrated framework. Academy of Management Review, 9: 548-557.
- Ginsberg, A. & Venkatraman, N. 1985. Contingency perspectives of organizational strategy: A critical review of empirical research. Academy of Management Review 10: 421-434
- Gupta, A.K. 1984. Contingency linkages between strategy and general manager characteristics: A conceptual examination. Academy of Management Review, 9: 399-412.
- Gupta, A. K. & Govindrajana, V. 1984. Business unit strategy, managerial characteristics and business unit effectiveness at strategy implementation. Academy of Management Journal, 27: 25-41.
- Hall R.H. 1977. Organization structure and process. 2nd ed. Englewood Cliffs, N.J.: Prentice-Hall.
- Hambrick, D.C. & Snow, C.C. 1977. A contextual model of strategic decision making in organizations. Academy of Management, Best Paper Proceedings, 109-112.
- Hambrick, D. C. 1980. Operationalizing the concept of business level strategy in research. Academy of Management Review, 5: 507-515.

- Hambrick, D.C. 1981a. Environment, strategy and power within top management teams. Administrative Science Quarterly, 26: 253-275.
- Hambrick, Donald C. 1981b. Strategic awareness within top management teams. Strategic Management Journal, 2: 263-279.
- Hambrick, D.C. 1982. Environmental scanning and organizational strategy. Strategic Management Journal, 3: 159-174.
- Hambrick, D.C. 1983. Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. Academy of Management Journal, 26: 5-26.
- Hambrick, D.C. & Mason, P.A. 1984. Upper echelons: The organization as a reflection of its top managers. Academy of Management Review, 9: 193-206.
- Hambrick, D.C. & D' Aveni, R. 1985. Top management characteristics and strategic failure. Paper presented at the 4th International Conference, Strategic Management Society, Philadelphia, PA.
- Hambrick, D.C.(Ed.) 1988. The executive effect; Concepts and methods for studying top managers, JAI Press; Greenwich, Connecticut.
- Hambrick, D.C. & Finkelstein, S. 1987. Managerial discretion: A bridge between polar views of organizations, Research in Organizational behavior, L. Cummings and B. Staw, (eds), JAI Press, 396-406.
- Hannan M.T. & Freeman, J.H. 1977. The population ecology of organizations American Journal of Sociology, 82: 929-984.
- Hart, P. & Mellons, J. 1970. Management youth and company growth: A correlation, Management Decision, 4: 50-53.
- Harrigan, K.R. 1983. Research methodologies for contingency approaches to business strategy. Academy of Management Review, 8: 398 - 405.
- Harrigan, K.R. 1985. An application of clustering for strategic group analysis, Strategic Management Journal, 6: 55-73.
- Hatten, K.J. & Schendel, D.E. 1977. Heterogeneity within an industry: Firm conduct in the brewing industry 1952-1971. Journal of Industrial Economics, December: 97-113.
- Hayes, R. H., & Abernathy, W.J. 1980. Managing our way to economic decline Harvard Business Review, 58: 67-77.
- Heidrick & Struggles Inc. 1980. Profile of a chief executive officer, Chicago: Heidrick and Struggles Inc.
- Helmich, D.L. & Brown, W.B. 1972. Successor type and organizational change in the corporate enterprise. Administrative Science Quarterly, 17: 371-381.

- Herbert, T.T., & Deresky, H. 1987. Generic strategies: An empirical investigation of typology validity and strategy content. Strategic Management Journal, 8: 135-147.
- Hitt, M.A., Ireland, R.D. & Palia, K.A. 1982. Industrial firms grand strategy and functional importance: Moderating effects of technology and uncertainty, Academy of Management Journal, 25: 265-298.
- Hofer, C.W. 1980. Turnaround strategies, Journal of Business Strategy, 1: 19-31.
- Hofer, Charles W., & M. Davaust. 1977. Successful strategic management. Chicago: A.T. Kearney.
- Hofer, Charles W., & Schendel, D.E. 1978. Strategy formulation and analytical concepts, St. Paul, MN: West Publishing.
- Hosmer, L.R. 1982. The importance of strategic leadership, Journal of Business Strategy, 3: 247-57.
- Huber, G.P, & Power, D.J. 1985. Retrospective reports on strategic level managers: guidelines for increasing their accuracy. Strategic Management Journal, 6: 171-180.
- Huff, A.S. 1982. Industry influences on strategy reformulation, Strategic Management Journal, 3: 119-131.
- Jauch, L.R., Martin, T.N. & Osborn, R.N. 1981. Top management under fire. Journal of Business Strategy, 1: 33-41.
- Katz, D. & Khan, R.L. 1966. The social psychology of organizations, New York: John Wiley and Sons.
- Kerr, J. 1982. Assigning managers on the basis of lifecycle Journal of Business Strategy, 2: 58-65.
- Kotin, J. & Sharaf, M. 1976. Management succession and administrative style, Psychiatry, 30: 237-249.
- Kimberly, J.R. & Evansiko, M.J. 1981. Organizational innovation: The influence of individual, organizational and contextual factors on hospital adoption of technological and administrative innovations. Academy of Management Journal, 24: 689-713.
- Kirchner, W. K. 1958. Age differences in short term retention of rapidly changing information, Journal of Experimental Psychology, 55: 352-358.
- Kotter, J.P. 1982. The general managers, New York: Free Press.
- Krejcie, R.V. & Morgan, D.W. 1970. Determining sample size for research activities, Educational and Psychological Measurement, 30: 607-610.

- Lawless, M.W. & Finch, L.K. 1989. Choice and determinism: a test of Hrebiniak and Joyce's Framework on Strategy-Environment Fit, Strategic Management Journal, 10: 351-366.
- Lawrence, P.R., & Dyer, D. 1983. Renewing American Industry, New York: Free Press.
- Lawrence, P.R. & Lorsch, J.W. 1967. Organization and environment, Homewood, Ill.: Irwin.
- Lenz, R.T. 1981. Determinants of organizational performance: An interdisciplinary review. Strategic Management Journal, 2: 131-154.
- Levering, R., Katz M., & Moskowitz, M. 1984. The computer entrepreneurs, New York: New American Library.
- Leontiades, M. 1982. Choosing the right manager to fit strategy, Journal of Business Strategy, 3: 58-69.
- Lieberson, S. & O'Connor, J.F. 1972. Leadership and organizational performance: A study of large corporations. American Sociological Review, 37: 117-130.
- Lorange, P. 1980. Corporate planning. Englewood Cliffs, N.J.: Prentice Hall.
- Lubatkin, M., Chung, K., Rogers, R.C., & Owers, James E. 1986. The effect of executive succession on stockholders' wealth of large corporations. Academy of Management Proceedings,
- Maccoby, M. 1981. The Leader: A new face for American management, New York: Simon & Schuster.
- MacMillan, I.C. 1978. Strategy formulation: Political concepts. St. Paul, MN.: West Publishing. 36-40.
- MacCrimmon, K. R. & Taylor, R. N. 1976. Decision-making and problem solving, Handbook of Industrial Psychology, Chicago: Rand McNally.
- March, J. G., & Simon, H. A. 1958. Organizations. New York.: Wiley.
- McDaniel, S. W. & Kolari, J.W. 1987. Marketing strategy implications of the Miles and Snow typology. Journal of Marketing, 51: 19-30.
- Meyer, A. 1982. Adapting to environmental jolts, Administrative Science Quarterly, 27: 515-587.
- Miles, R. H. 1982. Coffin nails and corporate strategies, Englewood Cliffs, N.J.: Prentice Hall.
- Miles, R.E. & Snow, C. 1978. Organization strategy, structure and process. New York: McGraw Hill.

- Miller, D. & Friesen, P.H. 1978. Archetypes of strategy formulation, Management Science, 24: 921-933.
- Miller, D., Kets de Vries, M. F. R. & Toulouse, J. M. 1982. Top executive focus of control and its relationship to strategy making, structure and environment. Academy of Management Journal, 25: 237-253.
- Miller, D., & Toulouse, J.M. 1986. Chief executive personality and corporate strategy and structure in small firms. Management Science, 32: 1389-1409.
- Miller, D. 1987. Strategy making and structure: Analysis and implications for performance. Academy of Management Journal, 30: 7-32.
- Mintzberg, H., & Waters, J. A. 1982. Tracking strategy in an entrepreneurial firm. Academy of Management Journal 25: 465-499.
- Mintzberg, H. 1978. Patterns in strategy formation. Management Science. 24: 934-948.
- Mintzberg, Henry. 1982. Power and organizational life cycles. Academy of Management Review, 9: 207-224.
- Norburn, D. 1986. GOGO's, YOYO's and DODO's: Company directors and industry performance, Strategic Management Journal, 7: 101-117.
- Norborn, D., & Birley, S. 1988. The top management team and corporate performance. Strategic Management Journal, 9: 225-238
- Nunnally, J. 1967. Psychometric Methods, New York: McGraw Hill.
- Ohmae, Kenichi. 1985. Triad power: the coming shape of global competition. New York: Free Press.
- Osborn, R.N., Jauch, L.R., Martin, Thomas N. & Glueck, W.F. 1981. The Event of CEO Succession, Performance and Environmental Conditions. Academy of Management Journal, 4: 183-192.
- Pascarella, Perry. 1984. The New Achievers. New York: Free Press.
- Pavett, C.M. & Lau, A.N. 1983. Managerial work: The influence of hierarchical level and functional specialty. Academy of Management Journal, 26: 170-178.
- Pearce, J.A. 1981. An executive level perspective on the strategic management process, California Management Review, 29: 39-48.
- Pearce, J.A., & De Nisi A. 1983. Dominant coalition formulation as interpreted through attribution theory, Academy of Management Journal, 26: 119-128.
- Pearce, J. A., & Robinson, R. B. 1987. A measure of social power in strategic decision making. Strategic Management Journal, 8: 297-304.

- Peter, J.P. 1981. Construct validity; A review of basic issues and marketing practices, Journal of Marketing Research 13: 133-145.
- Peters, T.J. & Waterman, R.H. In search of excellence: lessons from America's best run companies New York: Harper & Row.
- Porter, M.E., 1980. Competitive strategy: Techniques for analyzing industries and competitors. New York: Free Press.
- Pfeffer, J. & Salancik, G. 1978. The external control of organizations: A resource dependence perspective. New York: Harper and Row.
- Pfeffer, J. & Leblebici, H. 1973. Executive recruitment and the development of interfirm organizations, Administrative Science Quarterly, 18: 449-461.
- Rogers, E. M., & Shoemaker, P. 1971. Communications of innovations. New York: Harper and Row.
- Rosenthal R., & Rosnow, R. L. 1984. Essentials of behavioral research: Methods and data analysis, New York: Mc-Graw Hill.
- Rumelt, R.P. 1974. Strategy, structure, and economic performance, Boston, Mass: Division of Research, Harvard Business School.
- Salancik, G. R., & Pfeffer, J. 1977. Constraints on administrator discretion: The limited influence of mayors on city budgets. Urban Affairs Quarterly, 12: 475-496.
- Schendel, D., & Patton, G. R. 1978. A simultaneous equation model of corporate strategy. Management Science, 24: 1611-1621.
- Selznik, P. 1957. Leadership in administration. New York.: Harper & Row.
- Snow, C.C. & Hambrick, D.C. 1980. Measuring organizational strategies: Some theoretical and methodological problems. Academy of Management Review, 5: 527-538.
- Snow, C. C., & Hrebiniak, L. G. 1980. Strategy, competence and organizational performance. Administrative Science Quarterly, 25: 317-335.
- Snow, C.C. & Miles, R.E. 1983. The role of strategy in the development of a general theory of organizations. Advances in strategic management, 2: 231-259.
- Smith, K.G., Mitchell, T. R. & T. E. Summer. 1985. Top level management priorities in different stages of the organizational life-cycle. Academy of Management Journal, 28: 799-820.
- Smith, K. G., Guthrie, J. P. & Chen, M. J. 1986. Miles and Snow's typology, organizational size, and organizational performance. Academy of Management Best Papers Proceedings, 45-49.

- Smith, M., & White, M. C. 1987. Strategy, CEO specialization and succession. Administrative Science Quarterly, 32: 263-280.
- Song, J.H. 1982. Diversification strategies and experience of top executives in large firms. Strategic Management Journal, 3: 377-380.
- Stengrevics, J. M. 1981. The group executive: A study in general management, Unpublished doctoral dissertation, Harvard Business School.
- Stevens, J.M., Beyer, J.M., & Trice, H. M. 1978. Assessing personal role and organizational predictors of managerial commitment, Academy of Management Journal, 21: 380-396.
- Sturdivant, F.D., Ginter, J.L., & Sawyer, A.G. 1985. Managers' conservatism and corporate performance, Strategic Management Journal, 6: 17-38.
- Survillo, W. W. 1964. The relation of the decision time to brainwave frequency and to age, Electroencephalographic Clinical Neurophysiology 16: 510-514.
- Szilaygi, A. D., & Schwieger, D. N. 1985. Matching managers to strategies: A review and suggested framework. Academy of Management Review, 9: 626-637.
- Taylor, R.N. 1975. Age and experience as determinants of managerial information processing and decision making performance. Academy of Management Journal, 18: 74-81.
- Thomas, A. S., & Ramaswamy, K. 1989. Executive characteristics, strategy and performance: A contingency model, Academy of Management Best Paper Proceedings, 42-46.
- Thompson, J. D. 1967. Organizations in Action. New York: McGraw Hill.
- Tichy, N.M. 1982. Managing change strategically: The technical political and cultural keys, Organizational Dynamics 11: 59-80.
- Tichy, N.M., Fombrun, C.J. & Devanna, M.A. 1982. Strategic human resource management, Sloan Management Review, 23(2): 47-61.
- Trow, D.B. 1961. Executive succession in small companies, Administrative Science Quarterly, 6: 228-239.
- Virnay, B. & Tushman, M. 1986. Executive succession: The changing characteristics of top management teams. Academy of Management Best Paper Proceedings, 155-159.
- Weick, K.E. 1969. The social psychology of organizing. Reading, Mass.: Addison-Wesley.
- Weick, K.E. 1976. Educational organizations as loosely coupled systems, Administrative Science Quarterly, 21: 1-19.

- Weiner, N., & Mahoney, T. A. 1981. A model of corporate performance as a function of environmental, organizational and leadership influences. Academy of Management Journal, 24: 453-470.
- Wheelan, T.L. & Hunger, D.J. 1989. Strategic management and business policy, Reading, M.A.: Addison Wesley.
- Whetton, D.A. 1989. What constitutes a theoretical contribution? Academy of Management Review 14: 490-495.
- Wright, R.V.L. A system for managing diversity, Mass: Arthur D. Little, 1974.
- Wissema, J.G., Van Der Pol, H.W., & Messer, H.M. 1980. Strategic Management Archetypes, Strategic Management Journal, 1: 37-47.
- Woo, C. Y., and Cooper, A. C. 1981. Strategies of effective low share businesses. Strategic Management Journal, 2: 301-318.
- Zahra, S.A. 1987. Research on the Miles-Snow (1978) typology of strategic orientation: Review, critique and future directions, Academy of Management, Best Paper Proceedings.

Appendix A. Demographic Profile Questionnaire



VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061-0209

September 5, 1989

Dear Chief Executive Officer,

As a doctoral student in Management I am currently directing a research project on the role of CEO backgrounds in the success of organizations. Preliminary results based on analyses of financial information indicate that your company is one of the most innovative in the computer industry. In order for the research to progress further we need some basic information about your background and experience.

We would be extremely grateful if you could take a few moments from your busy schedule to fill out the enclosed demographic profile, or if you prefer, you could simply send us a copy of your bio-data. For your convenience a stamped, self-addressed envelope is also provided. All information you send us will be held in the strictest confidence.

As an expression of our appreciation we will send two of the fifty CEO's in our sample, a book of their choice. This decision will be based on a drawing, and the book will be mailed by the end of the month. A summary of the results of this project can also be sent to you. You may indicate your preferences on this page and send them in with the profile.

Thankyou so much for your time,

Sincerely,

Anisya Thomas
Project Director

I would like the following book:

_____ Title
_____ Author

Please send me a summary of the results of this research at the following address:

CEO Demographic Profile

Name of Company: _____

Name of CEO: _____

1. Year of birth: 19_____

2. Years of college education (circle one):-

0 1 2 3 4 5 6 7 8 more than 8

3. Were you the founder of the company: ___ Yes ___ No

4. Number of years you have worked in the Computer industry: _____

5. Number of years you have worked with this company: _____

6. Number of years you have been the CEO of this company: _____

7. Which of the following functional areas best describes your work experience?

_____ Marketing

_____ Accounting

_____ Operations

_____ Management

_____ Finance

_____ R&D

_____ Computer Engg.

_____ Production

_____ Other - Specify _____

Appendix B. List of Firms

3COM CORP
ADAGE INC
ADAPTEC INC
ADDMASTER CORP
ADVANCED MICRO DEVICES INC
ALDEN ELECTRONICS INC
ALLIANT COMPUTER SYSTEMS CORP
ALLOY COMPUTER PRODUCTS INC
ALPHA MICROSYSTEMS
ALPHAREL INC
ALTOS COMPUTER SYSTEMS
AMDAHL CORP
AMERICAN BUSINESS COMPUTERS CORP
AMERICAN MAGNETICS CORP
ANACOMP INC
ANALOG DEVICES INC
ANDERSON JACOBSON INC
APOLLO COMPUTER INC
APPLE COMPUTER INC
APPLIED DATA COMMUNICATIONS INC
APPLIED MAGNETICS CORP
ARCHIVE CORP
ARCTURUS INC
AST RESEARCH INC
ASTROCOM CORP
ATARI CORP
AUTO-TROL TECHNOLOGY CORP
AUTOMATIX INC
AYDIN CORP
BANCTEC INC
BARRISTER INFORMATION SYSTEMS CORP
BEEHIVE INTERNATIONAL
BELL INDUSTRIES INC
BIO-LOGIC SYSTEMS
BOLT BERANEK & NEWMAN INC
BOSTON DIGITAL CORP
BOWMAR INSTRUMENT CORP
BRITTON LEE INC
C3 INC

CADNETIX CORPORATION
CHECK TECHNOLOGY CORP
CIPHER DATA PRODUCTS INC
CIPRICO INC
COGNITRONICS CORP
COMMODORE INTERNATIONAL LTD
COMPAQ COMPUTER CORP
COMPUGRAPHIC CORP
COMPUMED INC
COMPUSCAN INC
COMPUSONICS CORP
COMPUTER & COMMUNICATIONS TECHNOLOGY CORP
COMPUTER AUTOMATION INC
COMPUTER COMMUNICATIONS INC
COMPUTER COMPONENTS CORP
COMPUTER CONSOLES INC
COMPUTER DATA SYSTEMS
COMPUTER DESIGNED SYSTEMS
COMPUTER IDENTICS CORP
COMPUTER MEMORIES INC
COMPUTER POWER INC
COMPUTERVISION CORP
COMPUTONE SYSTEMS INC
COMPUTRAC INC
COMTREX SYSTEMS CORP
COMVERSE TECHNOLOGY INC
CONCORD COMPUTING CORP
CONCURRENT COMPUTER CORP
CONTROL DATA CORP
CONVERGENT TECHNOLOGIES INC
CONVEX COMPUTER CORP
CORVUS SYSTEMS INC
CPT CORP
CRAY RESEARCH INC
CREATIVE COMPUTER APPLICATIONS
CSP INC
CUBIC CORP
CYBERTEK COMPUTER PRODUCTS INC
DAISY SYSTEMS CORP
DATA GENERAL CORP
DATA I/O CORP
DATA SWITCH CORP
DATA TECHNOLOGY CORP
DATA TRANSLATION INC
DATAMAG INC
DATAPOINT CORP
DATAPRODUCTS CORP
DATARAM CORPORATION
DATASOUTH COMPUTER CORP
DBA SYSTEMS INC
DECISION INDUSTRIES CORP

DELTA DATA SYSTEMS CORP
DEST CORPORATION
DH TECHNOLOGY INC
DI/AN CONTROLS INC.
DICOMED CORP
DIEBOLD INC
DIGI DATA CORP
DIGILOG INC
DIGITAL COMMUNICATIONS ASSOC
DIGITAL EQUIPMENT CORP
DIGITEXT INC
DISTRIBUTED LOGIC CORP
DYNATEM INC
E-H INTERNATIONAL INC
EASTEK CORP
EECO INC
ELECTRONIC ASSOCIATES INC
EMC CORPORATION
EMULEX CORP
ENCORE COMPUTER CORP
ESPRIT SYSTEMS INC
EVANS & SUTHERLAND COMPUTER
EVEREX SYSTEMS INC
FIBRONICS INTERNATIONAL INC.
FILENET CORP
FINGERMATRIX INC
FLEXIBLE COMPUTER CORP
FLOATING POINT SYSTEMS INC
FRANKLIN COMPUTER CORP
FRANKLIN TELECOMMUNICATIONS CORP
GAMING & TECHNOLOGY INC
GATEWAY COMMUNICATIONS INC
GENERAL AUTOMATION
GENERAL INSTRUMENT CORP
GENICOM CORPORATION
GENISCO TECHNOLOGY
GERBER SCIENTIFIC INC
GOULD INC
GRIFFIN TECHNOLOGY INC
GULL INC
HARRIS CORP
HENRY (JACK) & ASSOC. INC
HEWLETT-PACKARD CO
HONEYWELL INC
HUTCHINSON TECHNOLOGY
HYTEK MICROSYSTEMS INC
ICOT CORP
IDENTIX INC
IEC ELECTRONICS CORP
IMTEC INC.
INCOMNET INC.

INDTECH CORP
INFORMATION INTERNATIONAL INC
INFOTRON SYSTEMS CORP
INTECH INC
INTEL CORP
INTELLIGENT BUS COMMNCT
INTERFACE SYSTEMS INC
INTERMEC CORP
INTERNATIONAL BUSINESS MACHINES
INTERNATIONAL TOTALIZATOR SYSTEMS INC.
INTERPHASE CORP
IOMEGA CORP
IPL SYSTEMS INC
IRWIN MAGNETIC SYSTEMS INC
ISC SYSTEMS CORP
IVERSON TECHNOLOGY CORP
KAYPRO CORP
KEY TRONIC CORP
KMW SYSTEMS CORP
KUSTOM ELECTRONICS INC
LEE DATA CORP
LEXICON CORP
LITTON INDUSTRIES INC
LTX CORP
MAI BASIC FOUR INC
MASSACHUSETTS COMPUTER INC
MASSTOR SYSTEMS CORP
MAXTOR CORP
MAXXIMA CORP.
MEGADATA CORP
MICOM SYSTEMS INC
MICRO DISPLAY SYSTEMS INC
MICROBILT CORP
MICROCOM INC
MICRODYNE CORP
MICRON TECHNOLOGY INC
MICROPOLIS CORP
MICROS SYSTEMS INC
MICROSOFT CORP
MILTOPE GROUP INC
MINISCRIBE CORP
MONITERM CORP
MOSCOM CORP
MYLEX CORP
NASHUA CORP
NATIONAL COMPUTER SYSTEMS INC
NATIONAL MICRONETICS INC
NATIONAL SEMICONDUCTOR CORP
NBI INC
NCR CORPORATION
NETWORK SYSTEMS CORP

NORTH ATLANTIC INDUSTRIES INC
NOVELL INC
OAK TREE CONSTR COMPUTER
PACER CORP
PAR TECHNOLOGY CORP
PATTERN PROCESSING TECHNOLOGY
PERCEPTION TECHNOLOGY CORP
PERIPHERAL SYSTEMS INC
PERSONAL COMPUTER PRODUCTS INC
PRIAM CORP
PRIME COMPUTER INC
PRINTRONIX INC
PYRAMID TECHNOLOGY CORP
Q/CARS TECHNOLOGY INC.
QANTEL CORP
QMS INC
QUALITY SYSTEMS INC
QUANTUM CORP
RAMTEK CORP
RECOGNITION EQUIPMENT INC
RECOTON CORP
REUTER INC
REXON INC
RISK (GEORGE) INDUSTRIES INC
ROBOTIC VISION SYSTEMS INC.
SAFEGUARD SCIENTIFICS INC
SBE INC
SCAN-OPTICS INC
SCI SYSTEMS INC
SCIENTIFIC MICRO SYSTEMS
SCIENTIFIC TECHNOLOGIES
SCOTT INSTRUMENTS CORP.
SEAGATE TECHNOLOGY
SELECTRONICS INC
SEQUENT COMPUTER SYSTEMS INC
SERVO CORP OF AMERICA
SIGMA DESIGNS INC
SILICON GRAPHICS COMPANY
STAR TECHNOLOGIES INC
STD LOGIC INC.
STORAGE TECHNOLOGY CORP
STRATUS COMPUTER INC
SUMMAGRAPHICS CORP
SUN MICROSYSTEMS INC
SYMBOLICS INC
SYNERGISTICS INC
SYNTECH INTERNATIONAL INC.
SYNTREX INC
SYSTEM INDUSTRIES INC
TALBOTT CORP
TANDEM COMPUTERS INC

TANDON CORP
TANDY CORP
TEC INC
TECHNOLOGY INC
TEKTRONIX INC
TEL ELECTRONICS INC
TELECALC INC
TELEMATICS INTERNATIONAL INC
TELEVIDEO SYSTEMS INC
TELEX CORP
TELXON CORP
TERMIFLEX CORPORATION
TERMINAL DATA CORP
TERRANO CORP.
TEXAS INSTRUMENTS INC
TIMEPLEX INC
TITAN CORP
TRACE PRODUCTS
TRIAD SYSTEMS CORP
TSENG LABORATORIES
UNGERMANN-BASS INC
UNISYS CORP
UNIVATION INC
VALID LOGIC SYSTEMS INC
VERMONT RESEARCH CORP
VERTICOM INC
VIDEO SEVEN INC
VMX INC
VOTRAX INTERNATIONAL INC
WANG LABORATORIES INC
WELLS AMERICAN CORP
WESPERCORP
WICAT SYSTEMS INC
WORLD-WIDE TECHNOLOGY INC
WYSE TECHNOLOGY
XYLOGICS INC
XYVISION
ZENITH ELECTRONICS CORP
ZENTEC CORP
ZITEL CORP
ZONIC CORP.
ZYCAD CORP

**The two page vita has been
removed from the scanned
document. Page 1 of 2**

**The two page vita has been
removed from the scanned
document. Page 2 of 2**