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**Strategic Orientation, Distinctive Competences and
Multinationality Profiles of Businesses:
An Examination of the U.S. Pharmaceutical Industry**

by

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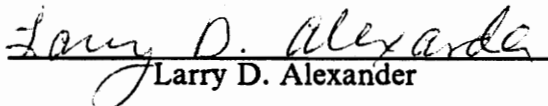
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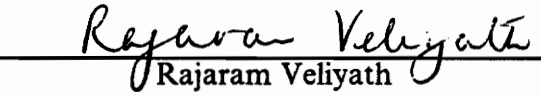
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(ABSTRACT)

This study empirically examined the relationship between strategic orientation of an organization and the overseas activities it pursues. It is argued that the nature and extent of an organization's overseas involvement will be a function of its dominant strategic orientation and the distinctive competences associated with such an orientation. Several hypotheses that build on the central notion of the "common thread", first articulated by Ansoff (1965), were developed and tested. Building on a systems typology of multinationals (Cheng & Ramaswamy, 1989), this study utilized many new measurement approaches that help measure level of internationalization in a multidimensional manner.

Set in the drugs and pharmaceutical industry, the empirical effort used objective secondary data to characterize both dependent and independent constructs. Tests of the hypotheses indicated that distinct multinationality profiles were associated with different strategic orientations.

Prospector organizations were found to emphasize their distinctive competences in research and development and marketing in their overseas efforts. They tended to operate a larger number of overseas R&D facilities and overseas sales offices than their

Defender counterparts. Further, they also exhibited a marked tendency to spread these activities over a larger number of countries than Defender firms. These findings support the theoretical notion that every organization builds around its distinctive competences to achieve competitive advantage (Ansoff, 1965; Miles & Snow, 1978; Porter, 1980).

It was hypothesized that Defender firms would exhibit higher levels of overseas production activity than Prospector firms in keeping with their competence in manufacturing and cost control. However, this hypothesis was not supported. Consistent with Horst (1972), further analysis revealed that the age of the firm may play a significant role in influencing internationalization of production activity.

This study represents the first effort in applying a typology of strategy to examine multinational corporations. Further, the study provides evidence to show that:

- (a) Strategic orientation of a firm plays a central role in influencing its international endeavors, and
- (b) Firms with distinct strategic orientations pursue dissimilar combinations of overseas activities even when operating in similar country environments. These differences could be attributed to differences in strategic orientations.

Besides raising concerns about the traditional economic theory of comparative costs, these findings provide several new avenues for organizational research. Building on this study many new research directions such as the performance implications of multinationality that have not been examined as yet could now be explored.

Acknowledgements

What started off as a personal challenge is now over. The doctoral program has been an experience of mixed emotions. There have been times when I truly felt that I must throw in the towel and leave. However, these periods were liberally interspersed with moments of intense self realization and wonderful intellectual interludes that helped me maintain balance. In retrospect, this program has been very exciting and rewarding.

My Chairman, Dr. Litschert, has been a major source of influence both in my personal growth and academic achievements. Lofty in ideals and stringent in academic standards, he has set an excellent example that I will strive to follow.

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Chapter I: Introduction

An Overview

This study built on key literature in the field of strategic management to address research questions relating to overseas activities of organizations. A broad overview of the major constructs and the theoretical linkages is provided to set the stage for an in-depth exposition.

Strategic Orientation and Distinctive Competences

It is commonly agreed that organizational effectiveness is an outcome of a firms' ability to adapt to its environment. Further, an organization adapts to its external environment through a series of strategic choices made by top managers relating to products, markets, technologies, etc. (Child, 1972). It has also been suggested that there are multiple ways in which an alignment with the external environment can be achieved (Ansoff, 1965; Miles & Snow, 1978). In order to develop a parsimonious framework that would capture the numerous situation specific variations in adaptive behavior, researchers have developed typologies of strategy. A typology of strategy comprises se-

veral alternative modes of adaptive behavior that organizations are generally known to exhibit. Among the various typologies that have been developed, the one by Miles and Snow (1978) is regarded as being holistic and most firmly anchored in the broader strategic management literature (Hambrick, 1983; Snow & Hrebiniak, 1980; Zahra, 1987). Miles and Snow (1978) describe three viable modes of adaptive behavior namely Prospectors, Defenders and Analyzers. Each of these modes encompasses a definitive **strategic orientation** or posture which includes an internally consistent set of attributes relating to the firms' strategy, structure and process. For example, the Prospector type is distinguishable by its unique skills in the areas of product research, marketing and basic engineering. These skills, referred to as **distinctive competences** relate to "the aggregate of numerous specific activities that an organization tends to perform better than other organizations in a similar environment" (Snow & Hrebiniak, 1980, p. 317). Much research suggests that the distinctive competences of an organization are reflected in all the activities it pursues because these skills are a source of sustainable competitive advantage (Andrews, 1971; Ansoff, 1965).

Multinationality Profiles

While there have been numerous attempts to categorize the adaptive modes of domestic organizations, little research has focused on behaviors of organizations operating in the broader international environment. It is argued that the concepts of distinctive competences and strategic orientation can be extended into this context to explain variations in the behavior of firms with international activities. Toward this end, this study attempted to explain the differences in **multinationality profiles** of firms by examining their respective strategic orientations. Multinationality profile, refers to the combination

of input, process and output related activity that a firm pursues overseas. It encompasses elements of depth or extent of each activity as well as the configuration or dispersion of these activities over various overseas locations. Chapter II provides a detailed description of these profiles.

Building on systems theory, overseas activities of firms can be classified into three main categories of activity namely input related (e.g., R&D, procurement etc.), throughput or process related (e.g., manufacturing, assembly etc.) and output related (e.g., sales etc.). It is argued that the relative emphasis placed by an organization on each of these activities (multinationality profile) will be a function of its distinctive competences and therefore its strategy. For example, Prospector firms that operate overseas should be expected to emphasize product research, marketing and basic engineering all of which are distinctive competences of this organizational type. Defenders on the other hand would be expected to emphasize their distinctive competences which include production engineering and cost control. These are the theoretical predictions that the study tested.

This study laid down a framework for examining the role of an organizations' distinctive competences and strategic orientation in influencing the profile of overseas activity pursued by the firm. Building on strategic management literature, an integrated model of multinationality was developed. The multinationality profile of an organization is a function of the firms' strategic orientation and distinctive competences according to the model. This chapter begins with a brief articulation of the problem that the study addressed, an introduction to the research issues and relevant literature, and concludes with an abbreviated insight into the potential significance of the research effort.

Problem Statement

A preliminary examination of any population of firms that pursue procurement, production and/or sales activities overseas (multinational firms) in a given industry helps identify interesting differences between firms. For example, (a) there are differences in the nature and extent of overseas activity each firm pursues, differences in multinationality profiles, (b) differences in the manner and form of evolution that firms have undergone in entering the international arena, and (c) differences in the motives that led organizations to internationalize. These differences translate into many significant issues that academic research can address. For example, (a) why do organizations go overseas?, (b) how do organizations go about establishing an international presence?, or (c) whether there are any performance differences associated with different forms of multinational activity. However this study focused on the key issue of explaining the reasons behind differences in the multinationality profiles of firms. For example, while one firm may rely more on overseas research than overseas production, another might rely more on overseas production than overseas sales or research. This variety in multinationality profile forms the central phenomenon of inquiry. The question then is, **why do two international firms within a given industry place differential emphasis on input, process and output related activities overseas?**

Having briefly outlined the central question behind the study, the discussion that follows examines alternative theories that could potentially explain the differences in multinationality profiles.

The Literature

The phenomenon of internationalization has become central to today's key industries due to a growing global economic interdependence (Porter, 1986). Although this interdependence is very evident in the trade balances of most developed and developing countries, very little has been done to examine systematically the antecedents of internationalization especially from an organizational viewpoint. Research in this area is either conjectural or too heavily steeped in attempting to identify macro-economic factors that drive internationalization processes (for a review see Buckley, 1985 or Rugman, 1982). While some have used economic concepts to explain internationalization (Buckley, 1985, 1988; Casson, 1985a,1985b; Caves, 1971,1980; Dunning, 1988; Vernon, 1974), others have used organizational concepts (Behrman, 1969; Behrman & Fischer, 1980; Herbert, 1984; Horst, 1972; Ronstadt, 1977; Teece, 1983). Key research using the two approaches is discussed below.

Economic theories of internationalization

Researchers in the areas of industrial and international economics have been concerned with the impact of macro-economic factors on internationalization processes. In their view, firms internationalize because of differential financial advantages that accrue from the differences in costs of labor, capital etc. across different countries in the international arena (Buckley & Casson, 1978; Kogut, 1985).

The economic approach is most often predicated upon theories of comparative costs (Brooke & Remmers, 1978). Consequently, the analysis is focused on cost differences across countries and relative demand for the goods produced leading to differential cost advantages in different markets. However, these cost advantages are available to all firms within any given industry. Therefore, this perspective does not, (a) provide any reasons why some firms internationalize while others remain within domestic environments even though theoretically all firms can acquire cost advantages by going overseas, and (b) explain why two international firms choose to internationalize different activities.

Other major sub-streams in economics dealing with internationalization include perspectives such as risk diversification, product life cycle, and surplus resource allocation. While these theories are able to explain industry level influences on the process of internationalization, they fail to explain why firms within an industry emphasize different forms of overseas activities. Although rational economic considerations may indeed be relevant in explaining inter-industry differences in overseas investments, they are less relevant in explaining specific firm level differences (Horst, 1972). **In other words, while economic approaches may provide a set of plausible factors that trigger internationalization processes, they fail to explain why two firms operating in the same industry overseas exhibit radically different profiles of activity.**

Organizational Theories of Internationalization

Theorists who adopt an organizational approach in examining the phenomenon of internationalization explicitly focus on a firm's internal characteristics such as market posture, features of the top management team, product-market profile, research orientation etc., all of which are firm specific (Behrman, 1969; Daniels, Pitts & Tretter, 1984; Egelhoff, 1982; Horst, 1972; Teece, 1983).

In essence, these researchers argue that internal business factors play a critical role in directing the process of internationalization (Behrman, 1969; Horst, 1972). This view can be built into a framework that explains internationalization. Building on the theory of strategic posture (see for e.g., Miles & Snow, 1978), and firm specific competences (Snow & Hrebiniak, 1980) a holistic model of multinationality can be conceived. In contrast to the economic approach which uses macro-economic factors as the independent variables triggering internationalization, a more voluntaristic view could be attempted.

Based on the theory of strategic choice (Child 1972), or the ability of managers to make key decisions, it may be argued that firms which internationalize are likely to differ from those that do not on key strategic dimensions. In other words, internationalization can be seen as being associated with the strategic orientation of the organization. Since strategic decisions are made in order to match firm specific competences with environmental opportunities, it can be argued that the nature and variety of overseas activities that a firm pursues will be a function of its dominant strategic orientation. This alternative conceptualization is capable of providing an explanation as to **why organizations within a given industry exhibit different multinationality profiles** which formed

the central question behind this study. Figure 1A provides a pictorial representation of the model.

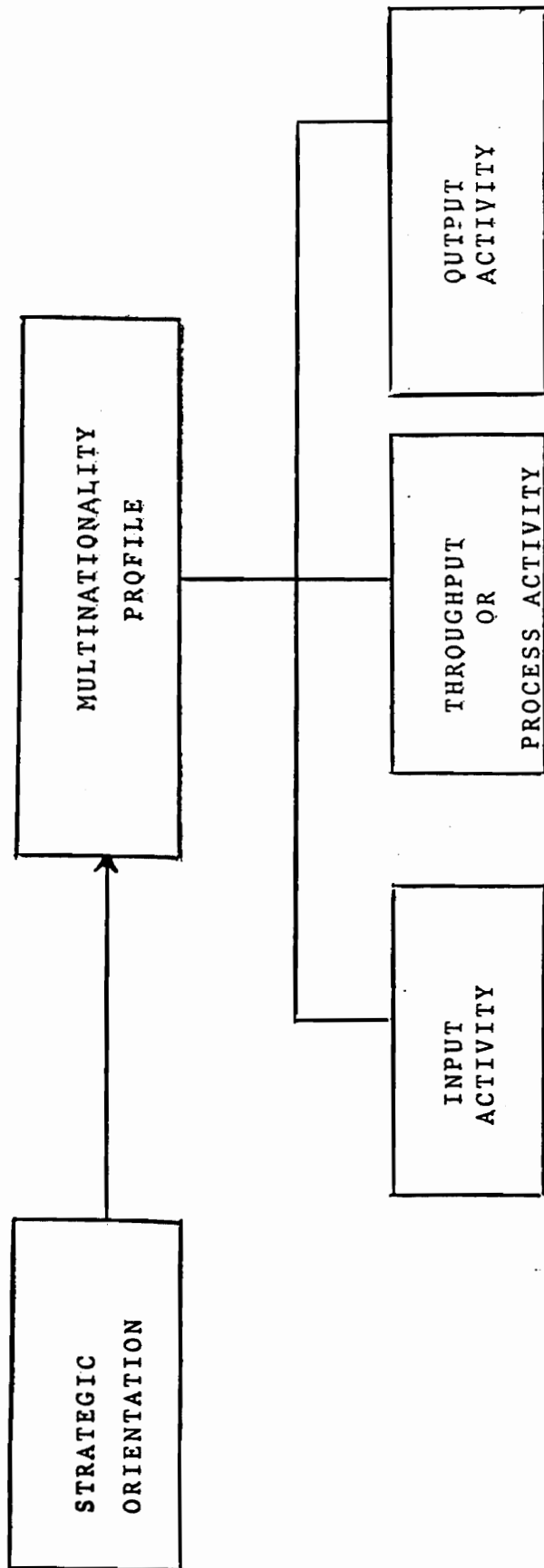


Figure 1A: The research model

The model builds on current thinking in the domain of strategic management research. It has been widely acknowledged that the opportunities that a firm pursues will be related to its core competences. For example, the Prospectors of Miles and Snow (1978) are expected to pursue market opportunities that are related to new product innovations while Defenders are expected to focus more on process enhancements to reduce cost. Therefore, taken together, a firm's strategic orientation and the distinctive competences that it embodies will direct the nature and variety of activities that the firm pursues. The research model that was developed by this study is driven by this central thesis which is in consonance with popular literature on strategy formulation (Andrews, 1971; Ansoff, 1965; Miles & Snow, 1978; Wheelen & Hunger, 1989).¹

¹ It is made explicit that the central entities of concern to this study are organizations that have already established overseas operations. Consequently, the motives behind internationalization, the means by which various firms internationalize etc. are beyond the scope of this study. Further, this study only addressed firms with specific physical facilities overseas. Hence, exporter/importer firms were excluded.

Research Focus

The Purpose of this Study

CONCEPTUAL GOALS

1. To develop a model that integrates past research in strategic management to explain the differences in the levels and variety of activities pursued by international firms. In doing so, this study explored the validity of traditional strategic management concepts as applied to the field of international management with a view to build on the conceptual base established in the field of strategy.
2. To provide theoretical explanations for the differences in the levels and variety of activities that a firm pursues overseas using the concept of strategic orientation.

EMPIRICAL GOALS

3. To develop a methodological framework for operationalizing strategic orientation and multinationality profiles using secondary data thereby providing direction for future research in this field.

Central Research Question

The theoretical model of multinationality proposed in this study has linkages that are causal in nature. No single study can successfully test this model in its entirety due to inherent difficulties that arise with the large number of variables that need to be ex-

amined and the causal directions of the linkages. Consequently, the best approach would be toward an hierarchical test of the model. Establishment of causality needs to be preceded by an establishment of associative linkages between the variables under study. Temporal order can be established only after examination of such association (Rosenthal & Rosnow, 1988). Pursuant to this approach, the study addressed the following research question which explores the associative linkage between strategic orientation and multinationality profiles of organizations.

Do firms with different strategic orientations exhibit different multinationality profiles in terms of overseas research, manufacturing and sales?

Empirical examination of the research issues identified was carried out in one setting in order to control for industry effects. The drugs and pharmaceuticals industry (SIC 2834) was used as the research site. The choice of the research site was made based on several considerations. The industry chosen had to comprise a reasonable proportion of firms that had foreign operations and a sufficient amount of variation in the nature of these activities in order to provide for an efficient test of the study's hypotheses. The drugs and pharmaceuticals industry provided such a setting. Due to its relative age, many firms have foreign operations and further, these firms exhibit the required variety in overseas activities. A detailed discussion of the industry background and appropriateness of choice is provided in Chapter III. Data for analyzing the research issues was collected mainly from secondary sources such as annual reports and 10K reports filed by the firms. A series of multivariate statistical tests were performed to examine the associative linkages identified by the model.

Significance of the Study

The proposed study makes several key theoretical contributions to the larger literature in strategic management. Some of the contributions are outlined below.

1. It is the first study to employ contemporary strategic management concepts such as strategic orientation and distinctive competence to explore the phenomenon of internationalization. This approach implicitly recognizes the dominance of strategic choice, the core paradigm in strategy research. By using traditional strategy concepts, the study therefore extends the domain to which such concepts have been applied in the past.
2. By developing a model that is well anchored in the larger literature, the study provides a theoretical perspective to a field of inquiry that is largely conjectural, anecdotal, and relatively theory free. This advance could be used to infuse the theoretical rigor that the field requires.
3. By examining associative linkages between strategic orientation and multinationality profiles of organizations, this study sets the stage for causal examination and establishment of temporal order. Building on this study, the role of strategic orientation in influencing an organization to expand overseas could be better examined.
4. By establishing the associative linkage between strategy and multinationality profiles, the study opens up many new areas of inquiry. For example, the implications of the "fit" between strategic orientation of a firm and its multinationality profile can be examined along performance dimensions.

5. In the domain of methodology, the study explored the relevance of several new objective measures of strategy and multinationality profiles based on secondary data. This empirical approach adds rigor to the field which has thus far been dominated by conjectural research.

Chapter II: Theory and Hypotheses

Theory, Research and Hypotheses

This chapter discusses past research on internationalization of business, and attendant concepts and theories in strategic management to derive an integrated model of multinationality profiles. The linkages proposed by the model are substantiated using theoretical perspectives, prior research findings, and historical evidence. The discussion also identifies a set of hypotheses derived from the model that the study will empirically address.

Discussion Framework

The discussion begins with an identification of contemporary research in the area of international business. Theoretical, substantive and methodological issues are addressed concurrently. Since multinational corporations (MNCs) formed the basic unit of analysis, the focus is rather heavily steeped on research on these organizational forms. Alternative units of analysis such as country environments and industry environments

are discussed to clarify and support observations that are made in the discussion. An in-depth analysis of economic and organizational approaches is also provided.

Internationalization and Multinational Corporations (MNCs)

What are Multinational Corporations?

The definition of an MNC has been a particularly nettlesome issue in the area of International Management. There seems to be little consensus if any about the distinguishing characteristics of MNCs. In a review of the various approaches adopted by past research in conceptualizing the term "multinational corporation", Aharoni (1971) reported the existence of numerous definitions that are not necessarily compatible with one another. He classified the definitions into three dominant approaches namely, (a) structural, (b) performance based, and (c) behavioral depending on the particular aspect that the researcher was attempting to focus upon. This review makes the significant point that these three approaches share very little commonalities. In other words, each definition leads to the inclusion of some firms and the exclusion of some others active in the international arena. In conclusion, Aharoni observes that these "differences are not merely a question of semantics, but that there are several kinds of so-called multinational companies" (p. 35).

It may be observed that no commonly accepted platform for defining an MNC is available because researchers have adopted a multitude of approaches, each focusing on one or more essential elements as the distinguishing characteristics. Some emphasize the

production aspect (e.g., Brooke & Remmers, 1978) while others emphasize the output aspect (e.g., Ewing, 1972). Again there is a distinct division in views based on the relative importance assigned to structural (e.g., Kolde, 1982), performance (e.g., Schollhammer, 1971) or behavioral dimensions (e.g., Drucker, 1969). This diversity in approach has led to a considerable fragmentation in the research stream and has often resulted in partial mappings of multinational populations at best. Table 2A provides a brief summary of several alternative ways in which MNCs have been conceptualized in past research.

Table 2A

Some previous definitions of Multinational Corporations

Author	Definition
Behrman (1969)	"The essence of the multinational enterprise is that it is attempting to treat the various national markets as though they were one - to the extent permitted by the governments.."
Brooke & Remmers (1978)	"A 'multinational company' is any firm which performs its main operations, either manufacture or the provision of a service, in at least two countries"
Casson (1985)	"any firm which owns outputs of goods or services originating in more than one country"
Ewing (1972)	an MNC "is managed with a worldwide point of view."
Herbert (1984)	"[a corporation] that has marketing and production facilities in many countries, has worldwide access to capital, depends on income from outside its home country, and is managed with a worldwide point of view"
Kolde (1982)	"..number of business establishments which function simultaneously in different countries"
Schollhammer (1971)	"any company that commits a significant portion of its financial, technical and managerial resources to overseas operations"
Vernon (1971)	"a cluster of corporations of diverse nationality joined together by ties of common ownership and responsive to a common management strategy"

In order to overcome the limitations imposed by the definitions adopted, any comprehensive research effort needs to identify a holistic conceptual platform that is specific enough to capture the subtle differences between various types of MNCs but broad enough to subsume the total population of such firms. Cheng and Ramaswamy, (1989) developed such a conceptual framework that could be used in future research. This conceptual framework is unique in that it uses existing literature in the areas of organization theory and strategic management to derive a system typology of MNCs. A brief discussion of the framework follows.

A System Typology of MNCs

The typology is based on systems theory that views organizations as work performing, open systems (Katz & Kahn, 1978; Georgopoulos, 1970). Katz and Kahn (1978) argue that all organizations acquire inputs (raw materials, technologies etc.) from their environments, process these inputs into products (also services) and finally exchange these final products with their environments for new inputs. Hence the process can be considered cyclical (Input-Throughput-Output). Although organizations may vary in the manner in which they perform these three system functions, it can be argued that every organization will have to perform these activities at acceptable levels of effectiveness in order to survive. Further, based on the concept of rationality (Simon, 1979; Thompson, 1967) it can be argued that a firm may choose to perform some or all of its systems functions overseas in order to optimize its overall systems efficiency or effectiveness depending on the nature of the inputs involved, the kinds of technologies used, and the legal fabric of countries where it chooses to operate. Based on these sys-

tem views, a typology of MNCs can be developed depending on the particular system function(s) internationalized. A pictorial representation of the typology is provided in Figure 2A.

INPUT	DOMESTIC (D)				INTERNATIONAL (I)			
TRANSFORMATION	D		I		D		I	
	D	I	D	I	D	I	D	I
OUTPUT								
CELL NUMBER	1	2	3	4	5	6	7	8

Figure 2A: A systems typology of multinational corporations

Source: Cheng & Ramaswamy (1989)

Based on the three system functions (Input - Throughput - Output), and the choice between two locations (Domestic Versus International), eight distinct profiles of multinationality can be developed. For example, a firm may have international resource procurement activities but might produce the final products domestically and market them in local markets while another firm might procure, process and market its products at an international level. Consequently, we can derive a categorization of seven possible combinations of multinationality. At one extreme (Cell 1) are firms that perform all three systems functions within the borders of one country while at the other extreme (Cell 8) are organizations that perform all three system functions on an international basis. Between these two extremes are firms that conduct some of their system functions domestically and other functions abroad.

This typology is only an approximation of the complex realities of the multinational population. However, it helps define various forms of multinationals thereby alleviating many of the problems associated with simplistic definitions based on structural, performance or behavioral approaches. In essence, this typology suggests that **a firm is multinational if it conducts one or more of its system functions overseas**. Therefore, it helps capture a larger proportion of the MNC population while maintaining the subtle differences that arise between different forms of MNCs. Due to inherent advantages that derive from this typology, this study used the framework described above. The empirical examination included all firms categorized as belonging to Cells 2-8.

The typology can be used for deriving holistic conceptualizations of multinationality as well. Unlike the concept of an MNC, which according to the typology is categorical, the concept of multinationality involves comparing two or more MNCs on parameters relating to the extent of international involvement. Specifically, three dimensions of multinationality can be defined namely, scope, depth and configuration of

multinationality². **Scope** relates to the number of system functions that a firm has internationalized. This is the critical parameter that essentially differentiates between domestic firms and international firms. In other words, a purely domestic firm will have no international activity along any system function and hence the scope (as defined above) for this firm will be zero. Therefore, firms that do not have any international activity along one or more system functions can be considered to be least internationalized while firms that have some form of international activity along all three system functions can be considered to be the most internationalized. The second dimension **depth** relates to the extent of internationalization of each system function. For example, this can be assessed in terms of the volume of activity performed overseas relative to the firms total (e.g., percent overseas production). The third dimension, **configuration** relates to the spread of system activities overseas. A concentrated configuration would imply that a firm performs its system functions in a relatively small group of countries while a dispersed configuration would imply that the firm spreads its system functions across many countries. It may be observed that both depth and configuration dimensions can be identified for each of the three system functions separately.

Taken together, these dimensions along with the three system functions (input/throughput/output) provide a comprehensive tool for examining multinational corporations and multinationality³. Specifically, it is possible to construct a profile for each organization relative to the nature and extent of overseas activity it pursues. Such a profile, termed multinationality profile, will provide information on, (a) number of

² Porter (1986) identifies two dimensions namely competitive scope and configuration of activities which are somewhat similar to the concepts defined here.

³ While scope, depth and configuration can be combined into a single index to measure levels of internationalization along each system function (input, process, output), the derivation of such an index would require a theoretical basis that is as yet unavailable. Consequently, this study measured each of these dimensions separately without attempting to combine them in any manner.

system functions that a firm has internationalized, (b) the volume or depth of activity it pursues along each system function, for example, number of overseas sales facilities or level of overseas R&D spending etc., and (c) the configuration of these activities with respect to geographic location.

Having provided a brief articulation of the essential elements of the system typology defining MNCs, the discussion that follows is focused on the central research question that this study addressed. Relevant literature is reviewed to develop the theoretical underpinnings of the model.

Economic Theories of Internationalization

Concepts of internationalization have for long been examined from an economics perspective. In order to explore the relevance of this stream of literature in addressing the questions raised by the proposed study, a brief review of the research stream is provided below. The discussion that follows, appraises the potential of the major substreams of economics as they relate to internationalization activities. The focus is on the relevance and applicability of these theories in answering the study's central question.

Theory of Comparative Costs

The theory of comparative costs features among the most rational explanations that economists offer in attempting to explain the phenomenon of internationalization (Dymsza, 1972; Kogut, 1985; Porter, 1986). Most of this research stream is based on the

Heckscher - Ohlin model which suggests that firms will shift their resources in a way to minimize overall costs.

The Heckscher - Ohlin model maps relationships between factor endowments of various countries and the nature of international activity pursued by firms that populate these countries. Basically, the model suggests that countries with relatively high levels of capital availability will tend to be dominant in the capital goods markets, primarily exporting capital goods. On the other hand, countries with lower labor costs or relatively easy access to a large labor pool will tend to be dominant in those products that require a substantial labor input. In essence, the international competence of a country could be judged based on the relative availability of capital and labor. However, empirical examinations of the implications and propositions of this model in the United States did not lend support (Brooke & Remmers, 1978). It was found that exports from the United States comprised both capital and labor intensive goods although the model predicts that a country such as the U.S. with large capital reserves and high labor costs would tend to export capital intensive goods rather than labor intensive goods. Schnitzer, Liebrez and Kubin (1985) provide a rudimentary discussion of the advantages and disadvantages of this approach.

Theories of comparative cost focus on cost differentials across countries. Consequently, under this perspective, it must logically be expected that all firms that go overseas would emphasize or engage in only those activities that provide them with a cost advantage. In other words, we must not observe any differences in the variety of activities that firms pursue in any single overseas location. However, there appear to be many such differences in the nature and variety of overseas activities that firms even within one industry emphasize. These differences cannot be reconciled with the theoretical predictions that follow from the comparative cost approach. Therefore, while

comparative cost theories could provide several plausible factors that motivate a corporation to go overseas, they do not explain why different international firms exhibit differences in multinationality profiles.

International Product Life Cycle theory

The international product life cycle (PLC) theory (Vernon, 1966) attempts to explain why firms invest overseas. This theory centers around the assumption that all products go through certain distinct stages of development, growth and decay. It suggests that the cycle starts with an innovation. Normally this arises in a country that has a relatively high level of R&D activity (Brooke & Remmers, 1978). Innovation is followed by trial manufacture and later on when the product is accepted in the market and demand grows, the firm switches to mass manufacture. It is this phase of mass manufacture that is predicated as motivating a firm to move into international markets. At that stage, rapid market expansion is necessitated by increasing production volumes which in turn are required to achieve economies of scale. During this stage, the level of competition increases and costs become important. The firm begins to search for production facilities depending on costs that make a significant difference. Although, this seems to be a plausible explanation for internationalization, this approach has certain critical drawbacks associated with it.

To begin with, the product life-cycle concept as originally discussed in the marketing literature has many caveats. It has been argued that it is impossible to generalize the concept to include all products and that it is impossible to identify a priori the appropriate beginning and end of each of the constituent phases of the cycle (Day, 1981; Dhalla & Yusseph, 1976; Rolando & Cook, 1969). Further, to have any practical sig-

nificance, the model needs to be able to predict stages a priori. A posteriori explanations are not of much significance to either academicians or practitioners because they preclude predictive validity. Due to these inherent fallacies, it is difficult to subject the model to any rigorous empirical examination.

Conceptually, it can be argued that product related factors alone are not fully responsible for internationalization. Under the product life cycle approach, firms operating overseas would be restricted to selling or output related activity alone. On the contrary, it is noticed that firms display a variety of overseas activities that include input, process and output related forms. However, the PLC concept maintains that firms go overseas only to secure a larger market for their products that are mass produced (for reasons of economies of scale), implying a focus on sales activity alone. Consequently, this approach is not suited to explain why two firms within one industry emphasize radically different forms of overseas activity in terms of input, process and output.

Summary

Contemporary economic theories of internationalization have certain inherent drawbacks such as their inability to explain and predict all forms and variations of internationalization processes that firms engage in. Although some of these theories seem to have tremendous potential in explaining certain causes of internationalization, they fail to explain why international firms differ in the nature and scope of overseas activities they pursue.

Economic theories deal with factors that are common to all firms within an industry (e.g., technology, labor costs, transportation costs etc.), or common to firms across

industries (e.g., tariff barriers, comparative costs of inputs etc.). However, an examination of such factors does not help explain the reasons behind differential foreign investments across firms in a given industry. Any attempt to explain international activity at the level of the individual firm must necessarily transcend industry specific factors to delve deeper into individual firm competences (Horst, 1972). In this context it appears that organizational factors may play a far more significant role in the process of internationalization than macro-economic factors such as comparative costs and political factors such as governmental assistance and regulation.

In summary, it may be observed that while economic approaches may provide a set of plausible factors that trigger internationalization processes, they fail to explain why two firms operating in the same industry exhibit radically different multinationality profiles. Having surveyed key aspects of the economics approach, the discussion that follows reviews organizational approaches.

Organizational perspectives of Internationalization

Organizational perspectives of internationalization remedy many of the drawbacks of the economists views. Taken together, the organizational approach suggests that a firm may choose to internationalize for many reasons including a need to acquire resources (Herbert, 1984), volume expansion to increase market share (Behrman, 1969), to meet diversification objectives, to use managerial talents available within the firm (Brooke & Remmers, 1978), to achieve cost leadership (Porter, 1980), to develop access to technological innovations abroad (Ronstadt, 1977; Ronstadt & Kramer, 1982), or to

keep up with industry trends. While the economics literature argues that a firm has to internationalize solely on the basis of cost considerations alone or as a response to industry level changes, the organizational perspective ascribes far greater importance to firm specific competences.

The discussion that follows identifies major variables that have been discussed in past literature as influencing internationalization profiles. Then, using theoretical concepts from strategic management literature, these variables are embedded in the theory of strategic orientation. The articulation attempts to theoretically establish that using strategic orientation as a subsumptive concept, the relative importance of the various factors such as resource acquisition, volume expansion and cost reduction can be better examined. Therefore, the underlying logic behind these arguments is the notion that a firm's strategic orientation essentially drives international activities that the firm will engage in. In other words, the nature and extent of overseas activity pursued by a firm is viewed as a function of its dominant strategic orientation and distinctive competences.

Intra-Organizational factors and Internationalization

Since the phenomenon of internationalization is conceptualized as transcending simplistic cost-benefit optimization motives, researchers adopting this perspective attempt the development of predictor sets comprising internal organizational variables.

Behrman (1969) lists several such factors including cost reduction, existence of surplus assets and talents, and difficulties of increasing market share in domestic markets. Fouraker and Stopford (1968) suggest that structural characteristics of organizations, and the breadth and depth of product lines they handle (product diversity) may

be a key variable in explaining internationalization activity. Vernon (1971) reports systematic strategic differences between domestic and international firms. His findings suggest that MNCs tend to rely more heavily on market orientation and overseas research activities than their domestic counterparts. Similar arguments emphasizing the key (causal) role played by organizational factors have been proposed by a host of researchers (Cavusgil, 1984; Cavusgil, Bilkey & Tesar, 1979; Cooper, Hartley & Harvey, 1970; Johanson & Vahlne, 1977; Kriplani & Macintosh, 1980; Welch & Wiedersheim-Paul, 1980). Taken together, these findings suggest that strategic variables such as R&D expenditure, market orientation, product diversity etc. may be explored as variables capable of explaining international endeavor. Building on the findings reported, the following discussion explores the theoretical aspects of using strategic orientation concepts as predictors of international activity.

The Concept of Strategic Orientation

Strategy has been defined as a stream of decisions that provide direction for the functioning of an enterprise (Mintzberg, 1978; Snow & Miles, 1983). The concept of strategy itself follows from the strategic choice perspective (Child, 1972) which argues that the executives of any corporation have a relatively wide domain of choices to make regarding products, markets, technologies and internal structures. Strategic decisions are made so as to align a firm with its relevant environment through a process often termed as coalignment (Thompson, 1967). In essence, strategy involves the proactive matching of a firm's internal strengths and weaknesses with opportunities and threats posed by the environment (Andrews, 1971; Ansoff, 1965; David, 1989; Pearce & Robinson, 1988; Wheelen & Hunger, 1989).

In his classical work on the concept of strategy, Ansoff (1965) emphasizes the criticality of the "common thread" that links a corporation's activities. The nature of activities that a corporation pursues is seen as being driven by internal competences of the firm. Further, "the triplet of specifications - product-market scope, the growth vector, and the competitive advantage - describes the firm's product-market path in the external environment" (p. 110). This line of rationalization implies that management provides strategic direction to the organization through a series of choices it makes so as to match environmental opportunities with firm specific competences. The content of resulting strategies has been the subject of extensive research in strategic management. Most of the theoretical and empirical inquiry in this regard has focused on typologies of strategic behavior.

Typologies of Strategic Behavior

In attempting to capture the complex realities of various situation specific strategies, researchers have evolved several typologies of strategic orientation (Brittain & Freeman, 1980; Galbraith & Schendel, 1983; Leontiades, 1982;1985; Miles & Snow, 1978; Miller & Friesen, 1978; Wissema, Van der Pol & Messer, 1980). Development of such typologies enables the holistic characterization of a firm's behavior, especially its transactions with its external environment. These typologies provide several alternative methods of classifying organizations into discrete categories based on many organizational features. Further, typologies can also aid in predicting organizational features and behavior. Since any "given organizational type is defined as a cluster of attributes that are internally consistent and occur commonly, the presence of some attributes logically permits the reliable prediction of others" (Snow & Miles, 1983, p. 242).

Of all the available typologies of strategic orientation, the typology set out by Miles and Snow (1978) is the only one that characterizes an organization as a complete system, especially its strategic orientation (Hambrick, 1983; Snow & Hrebiniak, 1980; Zahra, 1987). This typology was developed through post-hoc analysis of a host of firms in a variety of industries. Four organizational strategic orientations were identified of which three were considered to be viable in all industrial environments. A brief discussion of the salient features of these viable types follows.

Prospectors are organizations that often lead the technological and market aspects of the industry. They compete by pioneering new product development and innovating new products and marketing techniques at a pace that far outstrips the industry average. These firms are primarily market focused and are constantly searching for new product-market opportunities. To support this strategy of innovation and market leadership, these firms exhibit distinctive competences in marketing, product research, and basic engineering (Snow & Hrebiniak, 1980). Further, they maintain very high levels of flexibility in their information systems and organizational structures so as to be able to quickly respond to market trends and developments. Their competitive strength lies in their ability to move rapidly to take advantage of new opportunities.

Defenders are organizations that are internally focused. They compete primarily on the basis of price, quality, service etc. and often operate in a relatively narrow product-market domain. They emphasize operational efficiency and cost control relying on research and development activities that are targeted towards rationalizing production processes or cutting costs. To sustain this mode of competition, Defenders exhibit distinctive competences in production, applied engineering, cost control and financial management (Snow & Hrebiniak, 1980).

Analyzers are essentially hybrids of Prospectors and Defenders. While Prospectors are externally oriented and Defenders are internally oriented, Analyzers fall somewhere in between, synthesizing key elements of both internal and external orientation. Their product range, markets of operation and production technologies often reflect their dual emphasis. They adopt Prospector like behavior in their changing domains and Defender like behavior in their static domains.

This study used the Miles and Snow (1978) typology to characterize strategic orientation. This typology has very strong theoretical underpinnings (Hambrick, 1983) and has been subject to extensive empirical examination, the results of which have been very favorable (Zahra, 1987). Unlike many other alternatives, it is firmly anchored in organization theory and builds on the core concepts such as environments, organization structures and processes. It is perhaps the only typology that refines and synthesizes the theoretically seminal works of Andrews (1970), Ansoff (1965), Chandler (1962), and Thompson (1967). However, since this classification schema has not been used thus far to type organizations with overseas operations, only the two maximally different types namely, Prospectors and Defenders were used in this study. Having set out the basic elements underlying the concept of strategic orientation, characterized here according to Miles & Snow (1978), the discussion that follows explores the linkage between strategy and multinationality profiles of organizations.

Strategy and Multinationality Profiles

Strategic management theory suggests that an organization's competences are reflected by its dominant strategic orientation (Snow & Hrebiniak, 1980). Most typologies of strategy acknowledge this view by incorporating specific organizational features that

are embodied in each distinct strategic orientation (Galbraith & Schendel, 1983; Leontiades, 1982; Miles & Snow, 1978; Miller & Friesen, 1978; Porter, 1980; Wissema, Van der Pol & Messer, 1980). The Prospectors of the Miles and Snow (1978) typology for example, have competences in product innovation, rapidity of response to market shifts, market leadership, and capacity to handle high levels of environmental uncertainty, while Defenders have competences in production engineering, efficiency in operations, market penetration etc. Deriving from this logic of an internally consistent pattern of organizational competences that are associated with each strategy, most strategic management research argues that an organization's transaction with its relevant environment is driven by its internal competences (Andrews, 1971; Ansoff, 1965; Miles & Snow, 1978). This is the underlying logic behind the enterprise of strategic choice and its derivatives such as the upper echelon theory (Hambrick & Mason, 1984).

Following the thread of logic behind strategic orientation and distinctive competences, it can be argued that firms will internationalize at differential rates and will exhibit different profiles of scope, depth and configuration in their multinationality and that these differences can be explained by their dominant strategic orientation. The causal link between strategic orientation and multinationality profile can then be substantiated through strategic choice arguments (Child, 1972). Since internationalization is a movement that arises from a series of strategic choices made, it seems logical to expect that a corporation will tend to maintain the "common thread" (Ansoff, 1965) that links strategic actions into an internally consistent pattern. In other words, efficiency oriented firms (Defenders) may be expected to establish international manufacturing facilities in order to take advantage of lower production costs. Consequently, they may be expected to have a larger number of production facilities abroad than firms adopting alternative strategies. Firms that are characterized by first mover advantages (Prospec-

tors) may concentrate more on innovation abroad in order to take advantage of technological developments that will otherwise be unavailable to them. Consequently, they may be expected to establish a greater number of overseas R&D facilities than efficiency oriented organizations. In essence, the multinationality profiles associated with firms pursuing different strategies will be significantly different.

Viewing internationalization as an outcome of the strategic decision process, an argument could be made that the scope, depth and configuration of multinationality is driven by the choice process. Organizational decision makers survey both the internal organizational environment and the external environment to arrive at alternative ways of matching organizational competences to environmental opportunities (Andrews, 1971; Ansoff, 1965; Wheelen & Hunger, 1989). Therefore, a considerable amount of managerial choice may be exercised in making decisions relating to nature (scope), extent (depth) and location (configuration) of overseas activity.

As was argued earlier, the multinationality profile of an organization is a function of its dominant strategic orientation. Consequently, we should expect externally oriented Prospector firms to have multinationality profiles that are distinctly different from internally focused Defender firms. By definition, organizations with relatively high levels of external orientation would tend to focus on the output end of the system, internationalizing their sales activities. Such a focus follows from the external (market) orient- edness of the organization which essentially tries to capitalize on new product-market opportunities. These organizations can also be expected to exhibit relatively high levels of input internationalization as well. As has been suggested by Miles and Snow (1978), the externally oriented Prospector firms tend to concentrate on research and develop- ment activity which according to systems theory constitutes an input function. Such a

focus would be consistent with their core competences in marketing, sales promotion, and research and development (Miles & Snow, 1978; Snow & Hrebiniak, 1980).

On the other hand, since internally oriented Defender firms concentrate on production processes with a view to control or reduce overall product costs or to enhance efficiency. Hence, such firms may be expected to exhibit higher levels of throughput internationalization. Again, such a focus would be consistent with their core competences in production, engineering and cost control (Miles & Snow, 1978; Snow & Hrebiniak, 1980). Based on the theoretical arguments set out thus far, the following testable hypotheses⁴ can be developed. These hypotheses relate the dominant strategic orientation of a firm and its multinationality profile. A brief recapitulation of the theoretical premise underlying each set of hypotheses is also provided to refresh the readers' memory about the discussions set out thus far.

Prospectors and Input functions

As was observed earlier, research and development activity can be considered to be a special form of input function. Since research and development often involves boundary spanning and the gathering of information relating to current technological advances outside the organizational domain, it may be argued that this function essentially brings into the organization the key technological input. Such a view is consistent with Thompson's (1967) definition of boundary spanners and with the definition of input activity according to Katz and Kahn (1978). Consequently, using R&D to characterize input, the operational forms of the above hypothesis can be stated as follows. It is again reiterated that the dimensions of multinationality (scope, depth, configuration) can be

⁴ These hypotheses relate only to the population of firms that are multinational (Cells 2-8). Firms that are exporters/importers are excluded.

combined into a single index. However, this study did not attempt the formulation of such an index because of a lack of sufficient theoretical justification. Hence, the following hypotheses relate to depth and configuration elements separately. Consequently, there is no necessity to control for number of facilities or number of countries because each element was tested separately. Further, due to the unique nature of the population of firms examined (every constituent has some form of overseas activity), scope will be greater than one by definition.

H1: Prospector organizations will have a significantly larger number of overseas R&D facilities than Defender organizations.

H2: Prospector organizations will have R&D facilities spread over a significantly larger number of countries than Defender organizations.

Miles and Snow (1978), Porter (1980), Galbraith & Schendel (1984) and Behrman and Fischer (1984) suggest that research and development activity is a function of a firm's strategic orientation. Specifically, Miles and Snow (1978) and Snow and Hrebiniak (1980) observe that Prospector organizations emphasize higher levels of product R&D activity than do Defender organizations. Since R&D is a key competence of the Prospectors, we should expect such firms to build on that competence and consequently they may be expected to operate a larger number of R&D facilities overseas than would Defender organizations.

Since Prospector organizations are the key innovators in any industry, there is a pronounced need to monitor technological advances made both within domestic boundaries and at the global level. Consequently, we should expect these organizations to spread their R&D facilities over a larger number of countries than Defender organizations because the level of external environment scanning that a Prospector indulges in

is far greater than that undertaken by a Defender (Miles & Snow, 1978). However, it must be mentioned here that such facilities were expected to be spread over countries that have a technological competence greater than or at least closely similar to that of the home country. In other words, a test of the above hypothesis relating to configuration (defined as number of countries) did not include facilities located in countries that were seen by industry experts as lacking technological leadership. The hypotheses were tested at the group level (Prospector group vs. Defender group).

Defenders and Throughput functions

Throughput functions, also called process functions, typically relate to the process of manufacture or conversion of raw materials or intermediates into final products. Therefore, 'production facilities' was used to define the process function. Based on this conceptualization, the operational form of the hypothesis can be stated as follows.

H3: Defender organizations will operate a significantly larger number of overseas production facilities than Prospector organizations.

Defender organizations have been identified as those that compete primarily on the basis of cost and efficiency considerations (Miles & Snow, 1978). It has further been observed that these organizational types possess distinctive competences in production engineering, process cost control etc. (Snow & Hrebiniak, 1980). Consequently, given a Defender organization that operates overseas, it would be highly probable that it would be engaged in production activities to a greater level rather than research or sales promotion activities. Such an emphasis will be consistent with the distinctive competence of Defenders. It was not theoretically feasible to generate hypotheses relating to the configuration element of the process' function due to lack of prior research evidence.

Prospectors and Output functions

Output functions typically include all activities that are related to getting the finished product to the final customer. Therefore, all forms of market activity like distribution, sales etc. can be considered to comprise the output function. Based on this conceptualization, the hypotheses can be stated in operational form as follows.

H4: Prospector organizations will operate a significantly larger number of sales offices than Defender organizations.

H5: Prospector organizations will have sales facilities spread over a significantly larger number of countries than Defender organizations.

H6: Prospector organizations will sell their products in a significantly larger number of countries than Defender organizations.

Miles and Snow (1978) argue that Prospectors typically have a much wider market domain, and operate in a wider variety of markets than their Defender counterparts. The implication therefore is that Prospectors would sell their products in a larger number of markets (wider geographic market domain) than Defenders. Further, these firms are also expected to operate a larger number of sales facilities in their diverse market locations. Such behavior can be substantiated by the fact that these firms emphasize market accessibility and responsiveness over cost efficiency. Instead of emphasizing cost efficiency that can be achieved through a centralized sales system, these firms rely more on market accessibility and the ability to monitor developments on a market to market basis. Coupled with their distinctive competence in marketing and sales, they are expected to operate a larger number of sales facilities compared to Defenders.

In comparison, Defenders would opt more for centralized sales networks encompassing a relatively smaller number of sales offices so as to achieve cost efficiency. A test of this line of theorizing would require an examination of the number of sales facilities, number of countries where sales facilities are located and the total number of countries that a firm sells its products in irrespective of the existence of sales offices.

Summary

This chapter discussed the theoretical perspectives used in this study. Several competing approaches were discussed before choosing an approach that was considered appropriate for answering the research question. Based on the theory of strategic orientation, using the Miles and Snow (1978) typology of strategy, several testable hypotheses were derived. The chapter also introduced the concepts of multinationality and its components that were later incorporated into the hypotheses that were developed. The next chapter discusses the methodological framework that was used to test the hypotheses.

Chapter III: Research Methodology

In this section, the discussion is focused on the methodological framework used by this study. Specific issues relating to the choice of research site, methods of data collection, construct definition and operationalization, data analysis, validity and reliability are addressed. The discussion begins with an articulation of the issues involved in measuring strategic orientation of organizations.

Measuring Strategic Orientation

Classifying a firm's strategic orientation is one of the key issues in strategy literature. Many researchers have argued that the specific characteristics of the industry have to be taken into account to categorize individual firms within the industry context. In other words, it would be impossible to derive measures of strategy that could be applied across industries and define absolute scores along various dimensions to classify an organization. It is apparent that the concept of a firm's strategy is by definition relative to the other firms within an industry. Therefore, it is necessary to carry out strategic analyses on an industry specific basis. This approach has numerous advantages. As Snow and Miles (1983) observe, an industry can be interpreted as a surrogate for a comparable environment. Specifically, by limiting analysis to an industry, it is defensible

to assume that environmental effects are controlled for, technologies used are comparable and consequently observed effects are not artifacts of environmental origin (Harrigan, 1983). In keeping with this approach, this study limited itself to examining firm specific strategic behavior in a single industry environment, the drugs and pharmaceuticals industry. The reasons for choice of this setting are set out in a later section of this chapter.

Having identified the industry to be studied, the next issue that needs to be addressed is the choice of an appropriate approach to identify strategic orientation. Studies in the area of strategic management have relied on two key approaches. The first approach, called 'self-typing' is subjective in nature. It requires key company executives to identify the strategic orientation of their organization based on information provided to them in survey instruments. This approach has been used by many researchers in the past (e.g., Snow & Hrebiniak, 1980; Zajac & Shortell, 1989). The major drawback of this approach is that it produces a very personal and subjective picture of an organizations strategic behavior. This approach also suffers from all the biases of survey techniques such as key respondent bias, interpretation effects etc. Further, as Snow and Hambrick (1980) observe, the responses reflect intended rather than realized strategies. While examination of intended strategies may in itself provide an excellent source of research ideas, this study focuses on realized strategy.

The second dominant approach that has gained currency in recent times is the use of objective secondary sources identify strategy. Many researchers recognizing the need for objectivity in measurement, have suggested the use of objective indicators (e.g., Hambrick, 1983). An approach that uses secondary data overcomes many of the limitations of a subjective survey technique. It allows for triangulation of findings through innovative manipulations of measurement. Accessibility to relative large samples is en-

hanced by adopting such an approach. However, this approach can be constrained by the quality and nature of the data available and may indeed limit the creativity of new measure development. Limitations of secondary data in this context could include, (a) selective reporting, (b) errors in coding at source, (c) variations in basis of reporting, and (d) clerical errors. In view of the fact that potential advantages of this approach far outweigh inherent shortcomings, this study used objective secondary data. A discussion of the specific measures follows.

Measures of Strategic Orientation

Previous discussions in Chapters I and II identified the strategy classification scheme that the study used. The reasons behind the use of the Miles and Snow (1978) typology were also set out earlier. An empirical examination of the hypotheses required the classification of firms into the two extreme type namely Prospectors and Defenders. Therefore, for purposes of this study, the construct of strategic orientation was operationalized in terms of two sub-constructs namely (a) prospecting or market orient- edness, and (b) defending or efficiency orientedness. Such an operationalization is in keeping with the distinctive strategic behaviors of these two types of firms as identified by Miles and Snow (1978).

Measures of Prospector behavior

Measures of prospector behavior need to tap into the critical areas of research and development expenditure, market related expenditure and domains of operation. The following core measures were used for the purpose. While the discussion that follows

identifies key measurement dimensions, several ratios were computed to control for size effects.

Number of Industry Domains:

The number of industry domains that a firm operates in will be indicative of the prospector behavior. Miles and Snow (1978) observe that typically a Prospector-like firm will operate in a larger number of industry domains than Defender-like firms. This was measured in terms of the number of SIC codes that a firm is listed under. Every SIC code was considered to be indicative of a domain of operation.

Number of product-market segments:

In keeping with Miles and Snow's (1978) observation that Prospectors would offer a wider variety of products, a measure of product offering was derived. Within the context of the industry chosen, there is a fairly standardized classification of product offerings. Examples are, cardiovascular drugs, ophthalmic drugs, hypertension drugs etc. Consequently, by obtaining a numerical count of the total number of product classes that a firm offers, the diversity of product assortment was measured. Such an approach has been recently used by Cool and Schendel (1988) in their study of the same industry.

Market related expenditure:

Prospector-like firms are typically expected to have higher market related expenditures than Defender-like firms. Such an emphasis is necessitated because of their market orientedness. Market focus can therefore be measured by using two principal indicators namely advertising expenditure and sales expenditure. A variety of ratios like advertising expenditure to sales, and selling expenditure to were derived to control for the confounding effects of size.

Research & Development expenditure:

Prospectors are theoretically expected to have high levels of product related research expenditures because they introduce new products and change their offerings at a rate that is higher than the industry average. However, specific breakdown of a company's research outlays in terms of process and product research is difficult to obtain from secondary sources. This shortcoming is remedied by the unique industry context that was examined. A large number of studies have reported that research expenditure in this industry is specifically aimed at new product development. An analysis of the annual reports of firms in this industry reiterated this observation. Hence it would be defensible to argue that research expenditures as reported by these firms are predominantly product related and consequently can be used to measure prospector behavior. Several ratios such as R&D expenditure to sales, R&D expenditure per employee were derived while operationalizing this measure to control for the effects of size.

Measures of Defender behavior

Defender behavior was measured by indicators that relate to the efficiency of an organizations operations. As Miles and Snow (1978) observe, these types of organization are internally focused and rely on efficiency in operations as a means of achieving competitive advantage. The following key measurement dimensions are considered relevant.

Operations Costs:

An organizations operations costs are indicative of the relative levels of efficiency it achieves. Typically, stated in conventional accounting terms, operations costs include direct materials and direct labor. These are the two key costs that every organization

aiming at efficiency seeks to control. Consequently, ratio measures using operations costs can be derived to indicate relative efficiency levels. Examples of such measures include, operations costs to sales, operations costs per employee etc.

Cost of Goods Sold:

Cost of goods sold is a variation of the operations cost measures. The important distinction between the two is a matter of accounting treatment and reporting. Therefore, measures based on COGS such as COGS to sales, and COGS to employees were used as support measures for those based on operations costs.

Asset investments:

Miles and Snow (1978) observe that Defenders typically invest a major proportion of their capital in production assets. This is logical given the fact that such high investments are necessary to attain acceptable levels of operational efficiency. Therefore, in order to tap into this unique investment propensity two separate asset figures were used. First, a set of ratios based on total assets were derived (e.g., total assets to sales, total assets to employees etc.). Second, specific investments in property, plant and equipment were used to derive comparable ratios (e.g., property, plant and equipment investment to sales etc.). Such ratios have been used in past studies that have operationalized the Miles and Snow (1978) typology (Hambrick, 1983).

The discussions thus far focused on two key issues of measurement namely (a) control of industry effects and (b) approaches to typing strategies. The advantages of secondary data approaches were also discussed. Specific operational measures of the Miles and Snow (1978) typology were derived to identify Prospector-like firms and Defender-like firms. All the measures were discussed within the context of the efficiency versus market orientedness dichotomy which forms the central thesis of Miles and

Snow's (1978) classificatory schema. While the above discussion on measures identified the broad dimensions of measurement, it must be mentioned that sufficient operational precautions were taken to control for size effects by deriving several ratios.

To enhance the predictive validity of the measures used in defining the strategic orientation construct, the relative scores of individual firms were compared to the mean scores for the sample as a whole. This process identifies more clearly the relative standing of the individual firms within the sample chosen. Construct validity issues were addressed through an examination of the intercorrelation matrix of the variables listed above. Reliability coefficients (Cronbach α) were derived to determine the robustness of the construct indicators.

Measures of Multinationality Profiles

This study used dimension specific measures of multinationality profiles to enable a more holistic characterization of the construct under examination. Specifically, in keeping with the conceptual framework set out in Chapter II, this study measured internationalization along each of the three dimensions namely, input, process and output functions.

The dimension specific measures used in this study relate to the three system functions outlined. These indicators measure depth and configuration of international involvement along each system function. As was discussed in Chapter II, the depth and configuration elements were treated independent of one another. Although both form elements of one construct namely multinationality, due to lack of theoretical support, no effort was made to collapse the two to form a single index of multinationality.

Input Function

This study conceptualized R&D function as an input function. It is defensible to argue that research and development produces technological input for the organizational system. This approach is consistent with the open systems perspective (Katz & Kahn, 1978). This argument is further strengthened by the unique industry context that was examined. In the industry chose for study, R&D forms a very critical function. It may also be observed that a major proportion of R&D activity in this industry is focused on new product development or on basic research. Consequently, the R&D departments of firms within this industry would essentially be involved in providing technological inputs. In this regard, the following measures of input (R&D) internationalization were used.

Number of R&D Facilities (Countries)

This study used the number of countries where the firm operates R&D labs as an indicator of configuration of involvement in overseas R&D activities. By definition, configuration (R&D) increases/ decreases according to the number of countries where R&D labs are operated. As observed in Chapter II, a clear distinction was made between countries that are technologically advanced and those that are backward. Recall that it was hypothesized that Prospector-like firms will operate R&D facilities in a higher number of countries (implies technologically comparable locations).

Number of R&D Facilities (Total)

Number of overseas R&D facilities were used as an indicator of the depth of international involvement in overseas R&D activities. Based on the conceptual logic behind the depth dimension, it can be argued that depth increases as a function of the

number of overseas R&D facilities. Consequently, firms with a larger number of overseas R&D facilities can be said to have a deeper R&D involvement than other firms which have a relatively smaller number of such facilities.

Throughput or Process Function

The throughput function lends itself to fairly straightforward measurement. Since it is primarily concerned with processing activities, it is necessary to focus on the number of overseas plants that a firm operates. Depth was measured in terms of the total number of overseas manufacturing facilities.

Number of Overseas Plants (Total)

The total number of manufacturing plants and facilities located overseas was used as an indicator of depth of international process involvement. Depth of process involvement increases along with any increase in the total number of plants overseas.

Output Function

Overseas Sales (Countries)

The number of countries that a company sells in was used as an indicator of the configuration of overseas output involvement. The greater the number of countries that a firm sells in, the more widespread its output configuration. It may be noted that this indicator is not limited by the number of countries where a firm actually operates its sales facilities.

Overseas Sales Facilities (Total)

The number of overseas sales facilities was used as an indicator of the depth of output internationalization. Variations of this measure would include, proportion of overseas sales personnel, overseas distributors, etc.

Overseas Sales Facilities (Countries)

In order to examine the relative concentration of sales facilities it was necessary to examine the number of countries over which a firm spread its sales facilities. It may be recalled that it was hypothesized that Prospector-like firms would spread their sales facilities over a larger number of countries due to considerations of market proximity and rapidity of response that such a configuration provides.

Control Variables

Organizational size, measured in terms of employees and gross fixed assets were used as control variables in this study. Industry context and environmental confounds are also implicitly controlled for by limiting the study and analysis to one single industry.

The preceding discussion on the measures used by this study highlighted some of the critical issues involved in examining each of the constructs involved. It is acknowledged that these measures may provide a level of precision that is less than desirable. In furthering empirical inquiry into this field, it is necessary to develop and validate multiple measures that provide the maximum level of precision possible. As was observed earlier, the nature of measures used by this study was constrained by the theoretic-

tical development in the field of internationalization. Since this field has traditionally been anecdotal in nature, any empirical inquiry bears a responsibility to break new ground in measurement. Consequently, the measures used by this study are defensible in the light of the fact that this study is the first to examine a comprehensive model of internationalization based on contemporary strategic management and organization theory disciplines.

Having provided a detailed articulation of the variables that were examined, the discussion now focuses on other operational aspects such as research site, data collection methods and statistical analyses.

Research Site

The choice of research site was driven by the nature of the hypotheses tested by the study. In order to control for external influences such as dominant technologies, research intensity, differences in environments etc., the study was limited to one industry. Further, the sample was limited to firms based in the United States, in order to control for nationality effects that have been reported by a host of researchers (Behrman & Fischer, 1980; Buckley, Dunning & Pearce, 1978; Capon, Christodoulou, Farley & Hulbert, 1987; Dunning & Pearce, 1985; Schollhammer, 1971).

In essence, the industry sample chosen had, (a) to contain a fairly large number of firms with international activities, (b) to be restricted to one distinct industry rather than a random sample across industries in order to control for industry effects that have been reported (Harrigan, 1983; McDaniel & Kolari, 1987; Snow & Miles, 1983), and (c)

to be limited to firms based in one single country in order to control for nationality effects. In keeping with the criteria identified above, the drugs and pharmaceutical industry (SIC 2834) was used as a research site⁵. The choice was also influenced by Porter's (1980) observation that this industry can be considered to have become relatively stable and consequently we should expect to find a diversity in strategic orientations being adopted by firms that populate it. Another critical reason for this choice is that this industry has been in existence for a reasonably long period of time and many firms have had an opportunity to expand overseas as suggested by prior literature (e.g., Horst, 1972). A discussion of the features of the industry setting follows.

Drugs and Pharmaceuticals Industry (SIC 2834)

The drugs and pharmaceuticals industry has been the subject of much research because of its strategic importance in economic development. For example, Business Week (1989) lists this industry as one of the key industries in the American economy. Most of the major participants in this industry are relatively focused within the general field of manufacture and sales of drugs and pharmaceutical preparations. Even the larger firms that have extensive operations considerably limit their endeavor to this industry and consequently, there are not many highly diversified companies. Consequently, by choosing this industry the problems of dominant business vs. unrelated diversification (Rumelt, 1974) can be overcome. Being a fairly high profile industry, access to published data is possible. Numerous studies of this industry have been carried out in the past (e.g., Cool & Schendel, 1988; Peter, 1980) and these were used as background informa-

⁵ Limiting the sample to firms within one distinct SIC 4-digit code ensures comparability within samples because the classification is based on primary line of business. Such an approach is standard in strategic management research (Porter, 1980; Rumelt, 1974).

tion for interpreting the results. Most importantly, a fairly large proportion of firms in this industry had international operations. Taken together, it was possible to identify various profiles of multinationality within this industry. Since this is a highly competitive industry, the constituent firms exhibited the variety of strategic orientations required for testing the hypotheses that were derived in Chapter II.

Sample selection criteria

The preceding discussion on the research site establishes the macro level context within which the hypotheses were tested. The sample of firms was chosen based on numerous criteria. Sample selection criteria were based on factors such as nature of the hypotheses tested, data availability, data collection techniques etc. This study used only U.S firms that had overseas operations. Specifically, any firm within this industry that had some form of international activity (input/process/output) was chosen for inclusion in the study. Purely domestic firms were not studied because the hypotheses developed for testing did not necessitate such a selection. Firms that were mainly exporters or importers were also excluded. The sample selection process comprised a three stage procedure that included the following steps:

1. A master list of firms that have their primary source of revenue in SIC 2834 was developed. This list was limited to firms whose stocks are traded publicly, and excluded divisions and subsidiaries. Published secondary sources such as the Ward's Directory were used for the purpose. The precondition that the firms must have their major source of revenue

from the chosen industry avoids problems of distinguishing between corporate and business level strategies (Rumelt, 1974).

2. The financial and operating statistics of all firms that were included in this master list were examined. This examination helped identify those firms that had international activities in one or more of the three system functions.

3. A secondary list of all firms within SIC 2834 was developed. This group formed the sample frame used by the study and included only those firms that had internationalized one or more of their system functions.

The three stage procedure outlined above has several advantages. A sample that comprises all elements within a population, here, the population of MNCs in the industry, is far more superior than any random sampling approach. For example, in order to establish a defensible sampling frame using random sampling, we need to first establish those dimensions along which the elements will be chosen at random. As has been observed by Lynch (1982) such an identification is nearly impossible. Consequently, all random samples are essentially quasi-random. Besides effectively addressing this issue, the examination of the total population itself also provides significantly more power to detect the effects hypothesized.

Data Collection Techniques

This study relied entirely on secondary objective data. Secondary sources such as annual reports and Form 10K were used to create the data set for analysis.

Strategic Orientation Variables

An examination of the published sources indicated that data items relating to measures of strategic orientation were relatively easy to access. All the data items were collected from the Annual Reports and Form 10K that all public limited companies are legally required to file under SEC (Securities Exchange Commission) guidelines. Data items such as fixed assets, plant and equipment, advertising expenditure, number of domains of operation etc. were required for computing measures of strategic orientation.

Multinationality Variables

All public limited companies operating overseas report specific information relating to their operations subject to requirements and guidelines issued by FASB (Federal Accounting Standards Board) under Sec. 14. This FASB directive requires all firms that have 10% or more of assets overseas or 10% or more revenues accruing from overseas sources to report information by geographic segments. This information includes, (a) net sales by geographic segment, (b) inter-regional or subsidiary sales transfers, (c) identifiable assets by geographic segment, and (d) operating income by geographic segment. This segmental report formed the primary source of data for internationalization variables. Further information on the number of countries where R&D facilities and plants are located was obtained from the Form 10K. All companies provided a detailed list of manufacturing, sales and R&D facilities that they own or lease as part of the

Form 10K. This property listing was used as the basis for information on, (a) number of plants overseas, (b) number of countries where plants are located, (c) number of overseas R&D facilities, (d) number of countries where R&D facilities are located, and (e) number of countries where the company markets its products.

Data Analysis

The first step in the analysis of data collected involved validation. This step included, (a) cross checks to ensure data accuracy especially with data coded from original sources, and (b) cross validation through comparison with aggregate measures reported in multiple sources such as the Forbes listing of largest U.S. Multinationals. This step established the accuracy of data collected. In cases of discrepancies, the Annual Reports and Form 10K were used as the most reliable sources because there is reason to believe that all companies take sufficient care to ensure reliability of data reported in these public domain documents. Subsequent to this process, procedures such as construct validation and univariate statistical analysis were carried out so as to correct for normality in data etc. A discussion of the statistical procedures follows.

Construct Validation

Construct validity is perhaps one of the most critical elements in theoretical research. It relates to the degree of correspondence between measures and the construct (Cook & Campbell, 1979, 1976; Cronbach, 1971; Peter, 1981). Construct validation be-

gins with a definition of the theory based construct. The domain encompassed by the construct is a theoretical issue that needs to be addressed. In this study, two different constructs were defined namely, strategic orientation and internationalization profiles. The domain encompassed by these constructs has been delineated in Chapter II. The empirical validation of the boundaries established by these constructs was performed through a construct purification procedure (Churchill, 1979). Based on a domain sampling model (Nunally, 1967) an intercorrelation matrix of the measures of each individual construct was obtained. This matrix enabled the computation of coefficient α (Cronbach, 1971). This coefficient is a primary indicator of the robustness of the measures (Peter, 1979). The intercorrelation matrix also allows for the detection of items that cause a drop in the overall coefficient or exhibit inconsistency in size or direction compared to other items in the construct. After computing α , the items comprising the construct were examined in order to establish face validity or content validity.

Construct validity is most directly related to the question of what specific trait or concept the construct is measuring. While establishing a high coefficient alpha indicates an internally consistent, homogeneous set of items, it does not necessarily imply construct validity. Consequently, it is essential to examine convergent validity as well as discriminant validity. Although establishing convergence and divergence still does not address concerns of nomological validity, it is perhaps the best that empirical methods can do in validating constructs. After establishing the validity of the constructs used in the study, hypotheses testing procedures were initiated. Chapter IV provides a detailed discussion of construct validity assessments.

Hypotheses Testing Procedures

The methodology used by this study closely paralleled those used by Smith, Guthrie and Chen (1986) and Thomas and Ramaswamy (1989). Clustering algorithms were used to partition the firms according to their strategic orientation. Unlike previous studies, triangulation was established through the use of two different clustering procedures. Further, a separate set of external measures was also used to provide external validation for the cluster structures derived. A discussion of the statistical background of the analytical methods follows.

Statistical Analysis

Ansoff (1965) observed that a viable strategic orientation is characterized and distinguished by a "common thread" that links internal processes toward achievement of organizational goals. In order to characterize the richness of these processes, multivariate analyses are required. Several researchers have attempted the analysis of strategy data through the use of multivariate techniques such as regressions. Such approaches are partial as they fail to capture the internal thread of consistency that underlies viable strategic orientations (Hatten, Schendel & Cooper, 1978; Schoffler, Buzzell & Heany, 1974). Clustering techniques remedy this shortcoming by mapping distinct groups on the basis of independent constituent characteristics thus enabling an identification of the "common thread".

Much literature in strategic management supports the choice of clustering techniques over other multivariate approaches (e.g., Harrigan, 1985). The advantage of this technique is that it unravels profiles of linkages rather than simple bivariate linkages or

complex multivariate relationships. Since strategic orientation, operationalized in this study according to the Miles and Snow (1978) typology, can be defined as an internally consistent pattern of elements, cluster analysis seemed the most appropriate technique that could be used to decipher the patterns. As Aldenderfer and Blashfield (1984) observe, clustering is appropriate in situations where examination involves identifying theoretically defined patterns that group entities.

There are numerous approaches to clustering analysis. Since this technique is relatively new, very little research has been undertaken to establish objective criteria that could be used to identify the optimum clustering method. It is current practice to either use two or more different methods to establish cluster stability (e.g., Smith & Grimm, 1987), or to use an heirarchical two step procedure to first derive cluster centroids for seeding the modal clusters at the second stage (e.g., Lawless & Finch, 1989). In specific discussions on applying clustering techniques to partition strategy data, Harrigan (1985) observes that using the centroid method produces reliable results because it yields easily interpretable, fairly rounded clusters. This study used the centroid method. Further, in order to establish cluster stability and reliability, another method of clustering namely average linkage was used. Two different methods were used so that the results of both could be compared as a validation check (e.g., Smith & Grimm, 1987). A brief description of the operation of both methods follows.

The centroid method belongs to the family of heirarchical agglomerative clustering techniques that have become very popular in recent times. Blashfield and Aldenderfer (1978) in a review of all published clustering studies found that two-thirds used some form of agglomerative clustering. Centroid clustering was originally proposed by Sokal and Michener (1958). The procedure involves measuring distances in euclidean space between naturally occuring groups. The process is iterative in that groups are fused to-

gether on the basis of the distance between their centroids, the group with the smallest distance being fused first. To begin with, two cases or members are fused together based on the distance between their centroids, then the resultant group is fused with another depending on the distance thereby continuing the process iteratively till all cases are fused to form one single group or cluster.

The average linkage method is another agglomerative procedure. Proposed by Sokal and Michener (1958), this procedure computes an average similarity measure of cases under consideration. Clusters are fused together when a threshold minimum level of similarity is achieved. Stability and optimal cluster fusion levels in both cases can be inferred by an inspection of fusion coefficients (Everitt, 1977) and by examining the percentage change in cluster membership at various levels. Fusion coefficients denote points at which cases are merged to form clusters. Examining fluctuations in fusion coefficients, although subjective, is now considered a formal procedure (Aldenderfer & Blashfield, 1984). While more formal tests such as stopping rule #1 have been proposed (Mojena, 1977), they have not yet gained acceptance in the field.

The choice of the distance or similarity measure is as important as the choice of the clustering technique itself. Simulations have shown that different distance measures can produce varying results (Mezzich & Solomon, 1980). Prior research evidence was evaluated to choose an appropriate distance measure that could be used with the methods chosen. Harrigan (1985) observes that it is appropriate to use a squared euclidean distance measure with the centroid method because it ensures the formation of more rounded clusters. Everitt (1977) supports this contention and observes that the centroid method can be used with either similarity or distance measures such as euclidean distance but cannot be used with measures such as correlations because interpretation in a geometrical sense is not possible. Further, the creators of statistical package that was

used (SPSS-X) also recommend that euclidean measures be used with centroid clustering approaches. Therefore, euclidean distance measures were used with both clustering methods chosen.

The next step in the analysis involved identification of the variables that may be used to seed the clustering process. Again, this is a critical step because it is statistically possible to partition any conceivable dataset. The basic problem then is to define a set of variables that would discriminate between groups or in other words, variables that would help partition the cases into distinct groups. In this context Everitt (1980) underscores the criticality of appealing to theory in choosing clustering variables so as to guard against naive empiricism. In keeping with this observation, several measures of strategic orientation were derived. As set out earlier in this chapter, distinct dimensions of Prospector orientation and Defender orientation were theoretically derived. These dimensions were operationalized to control for size effects through the use of ratios.

It is common practice to use a set of measures to develop cluster solutions and then test for mean differences among the clusters based on those very same measures. This approach may seem tautological (Aldenderfer & Blashfield, 1984) although it can be argued that such tests of mean differences help identify the precise nature of the discriminating criterion variables. In order to address this concern, it is considered desirable to use a set of measures to derive cluster solutions and then use another independent external set of measures to validate the clusters obtained. This process, known as external validation, is considered to be a powerful approach to establishing the theoretical relevance of the clusters and in general it is agreed that the value of a cluster solution that has passed an external validation is far greater than a solution that has not. Toward this end a set of criterion measures was used to derive the solution and a set of external validation measures were used to validate the solution obtained. To the extent possible,

criterion measures were so defined that they did not share any common dimension with external validation measures.

The next concern is the need for normalizing data in case of high standard deviations. In this context, Everitt (1980), Edelbrock (1979) and Milligan (1981) strongly argue that any data transformation process could considerably reduce true 'between case' differences and suppress cluster formation. They further argue that normalization of data could substantially reduce between group differences precisely on those variables that could potentially be the most effective discriminators of group membership. Empirical support for this observation is provided by Matthews (1979) who reports that in Monte Carlo simulations it was found that standardization confounds cluster formation. In the light of this strong argument, data were not normalized. However, ratios were used especially because euclidean distance measures are extremely sensitive to size effects and can be plagued by elevation differences in data.

Both clustering methods report cluster formation at several hierarchical levels ranging from 1 to n where ' n ' is the number of cases. The appropriate cluster solution can then be chosen by examining the fusion coefficients. Confirmatory tests of mean differences in the total variable scores in each of the clusters were performed to ensure that the clusters differed in a statistically significant manner along expected theoretical dimensions. Once the cluster members had been identified, the multinationality profile correlates were examined. For example, the mean number of manufacturing facilities operated by the Defender group was tested against the mean for the Prospector group. These were paired one tailed t-tests. A series of Ordinary Least Squares (OLS) regressions were performed to derive effect size estimates.

Summary

This chapter discussed in detail the issues relating to operationalization of the constructs and the statistical procedures used for testing the hypotheses developed. Specifically, objective secondary measures of strategic orientation and multinationality were outlined. The measures were discussed within the backdrop of theoretical relevance and appropriateness. The use of clustering methods to analyze strategy data was also discussed in detail. This discussion also highlighted the salience of using dissimilar clustering algorithms to ensure cluster stability. The use of a criterion and validation set of measures was also examined as means of ensuring external validity of the clusters obtained. The next chapter discusses the results of the study.

CHAPTER IV: Data Analysis and Results

Empirical testing of the hypotheses set out in Chapter II were carried out using objective secondary data relating to firms in the drugs and pharmaceuticals industry (SIC 2834). Clustering techniques were used to partition the firms into Prospector firms and Defender firms. The stability of cluster solutions was established before the linkages between strategic orientation and overseas activity were tested. Results provided significant support for five of the six hypotheses that were generated. While the previous chapter set out the methodological framework, the discussion that follows details the operationalization of that framework.

Sampling Procedure

Initial data collection involved an identification of the total population of firms in the industry. A comprehensive list of firms that were involved in this industry (Drugs & Pharmaceuticals - SIC 2834) was developed through a compilation of multiple sources. In order to ensure a complete listing, sources such as **Ward's Directory of U.S. Corporations**, and **Dow Jones Directory of Corporations** were consulted. This list comprised 250 firms based in the United States. This initial group of 250 firms was further rationalized in order to derive the sub- population for testing. This step involved the

exclusion of firms that were subsidiaries of U.S./overseas corporations, privately held companies, organizations that earned less than 70% of their revenues from this industry and all conglomerates. The resultant population frame consisted of 80 firms.

The headquarters of all the 80 firms that were identified were requested to furnish copies of annual reports and Form 10K filings for the year 1987 which formed the base year for the study. Of these 80 firms, 63 complied with the request. In order to ensure complete representation and avoid sampling bias, the annual reports and Form 10K filings of the 17 non-respondents were obtained from alternative sources. A preliminary examination of financial and operational information pertaining to the 80 firms revealed that 42 had some form of overseas activity in the areas of research, sales or manufacturing. These 42 firms formed the sample used by the study. It must be observed that these 42 firms in effect comprise the total population of U.S. based companies that had some form of overseas activity and were primarily involved in drugs and pharmaceuticals manufacture. Since this study looked at the relationship between strategic orientation and overseas activity, the sample derived above represents the total population of firms of interest.

Data Collection and Validation

As was observed in Chapter III, secondary data were used for the analysis. The data items of relevance were divided into two distinct categories namely those that related to strategy and those that related to overseas activity. Data were coded directly from annual reports and Form 10Ks. Random cross-checks with other secondary sources such as the **Dow Jones News Retrieval Service** and **The World Directory of Multinational Enterprises** were carried out to ensure data validity. In a small number of

cases, the information furnished by the company was either ambiguous or inadequate. In such cases the Investor Relations Department and/or Office of International Operations was contacted for clarification.

Data Analysis

In order to gain preliminary insight into the distributions of the different variables, univariate statistics were computed. Table 4A provides the basic statistics relating to the sales revenue, employees, assets, investment in plant and equipment, income and age of firms in the population.

Table 4A
Descriptive Statistics for Firm Data

n = 42

Variable	Mean	Standard Deviation
Sales	\$1,665,726	\$2,195,398
Number of Employees	13,994	19,172
Total Assets	\$1,772,870	\$2,305,386
Plant & Equipment	\$517,315	\$684,665
Total Income	\$315,932	\$477,786
Company Age	47yrs.	38yrs.

As can be seen from Table 4A the sample statistics reveal a considerable amount of dispersion in terms of most characteristics. This dispersion is due to the tremendous differences in the size of operations of the constituents. These statistics underscore the need for some form of standardization of data and controls for size related effects.

The discussion that follows briefly sets out the procedures that were adopted to examine reliability of the measures employed and issues of construct validity.

Estimating Reliability: Cronbach's α

Measurement of internal consistency was the first step to assess the quality of measures. Cronbach's α is the most widely used indicator of internal consistency of a set of measures developed to identify any single construct. Cronbach's α was computed for the strategy measures to examine the reliability of the measures of strategic orientation that were developed. Reliability for the strategy construct was 0.62. Although, Nunally (1967) suggests that an α value of 0.80 is the minimum acceptable in social science research, previous studies in strategy have not been able to establish such a high reliability. Under normal circumstances, this reliability value is low. However, given the specific context of strategy research this value is acceptable. Of specific significance are the negative correlations between most Prospector measures and Defender measures. These correlations provide adequate support that the operationalized measures do indeed capture the divergent focus of the two extreme strategy types. However, while the intercorrelations between Prospector measures is quite high, the correlations between Defender measures, although statistically significant, are quite low. Table 4B reports the correlations for the indicators of the strategic orientation construct.

Table 4B

Pearson's correlation coefficients for the Strategy construct

	PDMAIN	NSEGMT	ADVVAL	RDSAL	SGAEMPL	TASEMP	COGSEMP	SALASS
PDMAIN	1.0000 P= .							
NSEGMT	.3980 P= .005	1.0000 P= .						
ADVVAL	.4569 P= .004	.5151 P= .001	1.0000 P= .					
RDSAL	.6032 P= .000	.4691 P= .001	.5135 P= .001	1.0000 P= .				
SGAEMPL	-.0797 P= .308	.0600 P= .353	.0227 P= .451	.0439 P= .391	1.0000 P= .			
TASEMP	-.1901 P= .114	-.2879 P= .032	-.3438 P= .027	-.1708 P= .140	.0793 P= .309	1.0000 P= .		
COGSEMP	.1566 P= .161	-.0332 P= .417	.0066 P= .486	-.0602 P= .352	.1762 P= .132	.5216 P= .046	1.0000 P= .	
SALASS	-.0090 P= .477	.2301 P= .071	.0873 P= .317	.0248 P= .438	.2597 P= .048	.3853 P= .006	.5157 P= .085	1.0000 P= .

PDMAIN = Number of product domains
 NSEGMT = Number of industry segments
 ADVVAL = Advertising exp./Net sales
 RDSAL = R&D exp./Net sales
 SGAEMPL = Selling exp./Employees (#)
 TASEMP = Total assets/Employees (#)
 COGSEMP = Cost of goods sold/Employees (#)
 SALASS = Selling exp./Total assets

The process was repeated for the dependent variable "multinationality" as well. Cronbach's α in this case was computed to be 0.82. Intercorrelations between the indicators of multinationality suggest that the depth and configuration dimension may be interrelated. In most cases, higher volume of activity (depth) on a system function was found to be associated with a wider dispersion (configuration) of activities as well. This implies that there is little empirical support for defining depth and configuration as two dimensions of multinationality. There also appears to be very high intercorrelations among the three system functions. Although this observation does not support the definition of multinationality along three system functions, the theoretical roots of such a conceptualization require more varied testing before arriving at definitive conclusions about its appropriateness. Table 4C reports the correlations for indicators of the multinationality construct.

Table 4C

Pearson's correlation coefficients for the Multinationality construct

	FRDFCL	FRDCTR	FPLANT	FSLCTR	FSOFCL	FSOCTR
FRDFCL	1.0000 P= .					
FRDCTR	.9466 P= .000	1.0000 P= .				
FPLANT	.6872 P= .000	.7392 P= .000	1.0000 P= .			
FSLCTR	.6707 P= .000	.7233 P= .000	.6288 P= .000	1.0000 P= .		
FSOFCL	.7348 P= .000	.7926 P= .000	.8860 P= .000	.7979 P= .000	1.0000 P= .	
FSOCTR	.7359 P= .000	.7792 P= .000	.7239 P= .000	.8739 P= .000	.9173 P= .000	1.00 P= .

FRDFCL = Number of overseas R&D facilities
 FRDCTR = Number of countries where R&D facilities are located
 FPLANT = Number of overseas manufacturing plants
 FSLCTR = Number of countries where firm sells its products
 FSOFCL = Number of overseas sales offices
 FSOCTR = Number of countries where firm has sales offices

While computing α provides an indicator of internal consistency of the items, it cannot be taken to imply that construct validity has been established. The following discussion identifies key issues in assessing construct validity.

Assessing construct validity

Construct validity comprises a series of critical validity issues. In the sequence of testing they are, (a) face validity, (b) internal consistency, (c) convergent validity, (d) discriminant validity, and (e) nomological validity. Face validity can be established if the items or measures chosen to identify a particular construct are well grounded in theory and are reasonably exhaustive in terms of construct identification. This was done through the development of an exhaustive set of measures of both dependent and independent variables. All the measures that were chosen as indicators were well grounded in the theoretical underpinnings of the constructs examined. The measures themselves were fairly comprehensive and exhaustive. The next step, measurement of internal consistency was carried out through a reliability analysis. The alpha scores indicate that the measures are quite stable and internally consistent.

The next two steps, establishment of convergence and establishment of divergence was carried out by examining the degree to which the measures correspond to results obtained through use of other methods (Churchill, 1979). In this specific context, it was not possible to cross-validate findings with other studies because only one other study (Hambrick, 1983) used secondary measures of a similar nature. It must be observed that the findings reported by Hambrick (1983) in respect of the asset intensity measure and R&D measure are replicated by this study. This provides limited validation for the

measures used by the study. Table 4B and 4C report the correlation coefficients of the two constructs namely strategic orientation and multinationality.

The next step, nomological validity can only be inferred. It is normal practice to see whether the measures behave in the theoretically consistent manner expected and the results need to be evaluated in the light of findings reported by other studies to establish consonance.

The process of construct validation also involves an appraisal of the sources of invalidity. Cook and Campbell (1979) identify several potential threats to validity. The key threats identified are (a) perceptual or interpretive bias, (b) inadequate preoperational explication of the constructs, and (c) bias arising from one (or few) indicators of a construct.

Perceptual or interpretive bias can arise when subjective questionnaire instruments are used. This may be further compounded by key respondent bias. These threats to validity may be guarded against by using objective data (Snow & Hambrick, 1980). Since this study used objective secondary data, potential threats occurring due to perceptual bias are controlled for implicitly.

The second threat to validity arises from inadequate preoperational explication of the constructs. In this particular study, sufficient attention was paid to the choice of construct indicators. Every measure used was based on prior research and theory. While the measures identifying the strategy construct were based in the larger literature on strategic orientation, the measures of the dependent construct were based in theories of internationalization (e.g., Porter, 1986). In this context, it may be observed that Hambrick's (1983) finding that R&D expenditures and Assets per employee were capable of discriminating between Prospectors and Defenders, was replicated. Since com-

parison of the measures used in this study provided strong agreement with Hambrick's (1983) findings, an argument for convergent validity can be made. Convergent validity of the multinationality construct could not be examined because this was the first study to define the construct in a holistic manner. Therefore, these findings could not be compared with other studies because none exist.

The third threat to validity is the use of one or a few measures of a construct. This leads to a less than holistic operationalization of the construct itself. The prescribed approach to the development of construct indicators is the use of multiple measures wherever feasible (Churchill, 1979). This study adopted such an approach by using eight measures of strategic orientation and five measures of multinationality. It must also be mentioned that even though operationalization of the strategy construct in terms of secondary measures is quite strong a tradition in strategic management research, only a couple of studies have used more than one single measure. In this regard, this study provides a more reliable approach to strategy typing by using eight measures of strategy. The same may be said of the dependent construct as well. While most of the previous studies have used one single indicator, foreign sales, to measure multinationality, this study makes significant progress by using multiple measures to identify all major avenues of multinationality, research and development, manufacturing and sales. In essence, the variety of measures used to describe both independent and dependent constructs ensures comprehensiveness of construct description and avoids the potential threats arising from use of one or two measures as most previous work in strategy has been done.

Having addressed the issues of reliability and validity of the measures, the following discussion focuses on the statistical analysis of the strategy construct.

Analysis of Strategy Variables

Strategy data were first taken up for analysis. Clustering approaches were used to partition firms into discrete categories. As was discussed in Chapter III, Average Linkage and Centroid algorithms were used for clustering. Although Table 4A shows that standard deviations were rather high, the data were not normalized in order to protect against suppressing true between cluster differences. The logic behind this approach was articulated in Chapter III.

Both clustering methods report cluster formation at several hierarchical levels ranging from 1 to n where 'n' is the number of cases. The appropriate cluster solution can then be chosen by examining the fusion coefficients. Four hierarchical levels of clustering were produced by the procedure. Table 4D and 4E report the fusion coefficients and percentage change in group membership from a four cluster solution to a single cluster solution.

Table 4D**Results of Cluster analysis using Centroid method**

n = 42

Cluster Level	Configuration of clusters	Fusion Coefficient (x 10⁷)	Change in Coefficient (x 10⁷)	% Change
Four	28-08-02-04	70.00	9.27	10
Three	28-12-02-00	60.73	20.35	5
Two	28-14-00-00	40.38	34.50	33
One	42-00-00-00	5.89		

Table 4E**Results of Cluster analysis using Average linkage method**

n = 42

Cluster Level	Configuration of clusters	Fusion Coefficient (x 10³)	Change in Coefficient (x 10³)	% Change
Four	28-08-02-04	26.45		
			1.81	10
Three	28-12-02-00	24.64		
			4.19	5
Two	28-14-00-00	20.45		
			12.78	33
One	42-00-00-00	7.67		

The fusion coefficients derived from both methods (Centroid and Average Linkage) indicated a marked variation between fusion coefficients at the two cluster level and the single cluster level. This variation can be interpreted to signify that the two cluster solution is likely to be optimal. This inference is further supported by the fact that there was only a marginal change (5%) in group membership between the three cluster solution and the two cluster solution. Hence the two cluster solution was used in all further analyses. This two cluster solution comprised two groups of firms, one with 14 members and another with 28 firms. While fusion coefficients indicate the appropriate number of naturally occurring clusters, a marked similarity or congruence between the results of the two different methods attests the stability of the cluster solutions. It must be noted that the solutions obtained from the centroid method and the average linkage method were identical. As Smith and Grimm (1987) observe, at a minimum such a congruence can be interpreted in terms of robustness of the clusters.

Having statistically established the stability of the two cluster solution, the next step was to explore the theoretical descriptions of the two groups. Specifically, it was necessary to theoretically establish the existence of two different strategic orientations and also derive an appropriate nomenclature for the groups. T-tests were performed on characteristic aspects of both groups. The variables that were examined at this stage included both criterion variables (variables used to develop the clusters) as well as external validation variables. It may seem tautological to partition a dataset based on a group of variables and then examine mean differences between the groups on those very same variables that were used to derive the clusters in the first place. However, such an approach has some advantages. For example, such testing can identify those variables that discriminate best between groups. Derivation of two clusters cannot be taken to imply that the two groups would be different on all variables. Further, in order to im-

part greater theoretical rigor, variables that were not used in the clustering process were also examined. Table 4F reports the results of t-tests performed on criterion variables and Table 4G reports t-tests performed on external validating variables.

Table 4F
Results of One-tailed Paired t-Tests for differences between
Prospector and Defender firms on criterion variables

Variable	Group	n	Mean	t value	p value	In Expected Direction
SALASS	Prospector	14	95.80	6.000	p < 0.001	Yes
	Defender	28	97.23			
TASEMP	Prospector	14	135.72	3.620	p < 0.001	Yes
	Defender	28	185.15			
SGAEMPL	Prospector	14	41.60	6.000	p < 0.001	Yes
	Defender	28	40.54			
COGSEMP	Prospector	14	43.28	8.460	p < 0.001	Yes
	Defender	28	42.42			

SALASS = Selling Expenses to Total Assets
TASEMP = Total assest per employee
SGAEMPL = Selling expenses per employee
COGSEMP = Cost of goods sold per employee

Table 4G
Results of One-tailed Paired t-Tests for differences between
Prospector and Defender firms on validating variables

Variable	Group	n	Mean	t value	p value	In Expected Direction
PDMAIN	Prospector	14	11.57	4.410	p < 0.001	Yes
	Defender	28	5.18			
NSEGMT	Prospector	14	2.85	3.750	p < 0.001	Yes
	Defender	28	1.78			
RDSAL	Prospector	14	356.94	12.360	p < 0.001	Yes
	Defender	28	28.56			
ADVSAL	Prospector	14	337.21	4.450	p < 0.001	Yes
	Defender	28	44.22			

PDMAIN = Number of distinct product domains
NSEGMT = Number of distinct industry segments
RDSAL = Research & Development expenditure to sales
ADVSAL = Advertising expenditure to sales

As can be seen from the results of the t-tests, the first group (N = 14) comprises firms that operated in a larger number of segments and product domains, had higher advertising and R&D expenditures, and higher selling and administrative expenditures. The second group (N = 28) had lower operations costs, lower input costs (COGS), more favorable asset turnover ratios, and higher total assets per employee. Interpreted in the light of the Miles and Snow (1978) typology, these findings suggested that Group 1 comprised Prospector firms and Group 2 comprised Defender firms. It may be observed that the measures show consistency with certain other studies in the field. For example, the measure of assets per employee can be seen as being consistent with Hambrick's (1983) finding. In summary, the differences in means between the two groups were theoretically expected and defensible.

Certain statistical concerns arise when numerous t-tests are performed of the same dataset. There is a probability that the errors will be correlated in such cases and as a consequence, mean differences will appear significant even in cases when they are not. This problem is exacerbated when the measures themselves have some degree of inter-correlation. However, this problem does not have major impact on the findings of this study because the 'sample' examined essentially represents the population of interest and therefore the notion of inferential statistics does not apply. The significance values are also quite high (0.001), hence the probability of erroneous conclusions arising from error correlations is quite low.

At this stage, the analysis of strategy data was complete. To recapitulate, several strategic variables were used to derive cluster solutions using two different clustering methods. The process resulted in two clusters that were identified as statistically stable and theoretically defensible. This part of the analysis culminated in the identification of a Prospector group of firms (N = 14) and a Defender group of firms (N = 28), thus

setting the background for an examination of the associative linkages between strategy and overseas activity.

Analysis of Overseas Activity Variables

Overseas activity variables included measures of both depth and configuration elements as set out in Chapter II and III. Specifically, the indicators used were, number of R&D facilities, number of countries where such facilities were located, number of manufacturing plants, number of countries that a firm sells its products in, number of sales facilities and the number of countries where the firm operated sales offices. A preliminary examination of data was conducted to identify whether there were any significant patterns in the location of overseas facilities that could be interpreted to suggest the existence of regulatory pressures.

The analyses revealed that every firm that had overseas research and development activity tended to operate R&D facilities in Western European countries (specifically Germany, France, U.K., and The Netherlands) and/or Japan. There were only two exceptions to this pattern where two companies operated R&D facilities in Australia and Brazil. Companies that performed overseas manufacturing activity tended to have plants located in most of the countries in the developed world, certain countries in the Far East that are characterized by low labor costs and certain other countries in Africa. This finding is quite significant because a very large proportion of firms had plants in developed countries as opposed to low cost locations as would have been theoretically expected. This is of special significance especially in the case of Defender firms which are expected to pursue cost economies. As far as sales activities were concerned, the

sample of firms collectively sold to almost every country in the world with a preference toward Western Europe.

Hypothesis Testing Procedure

Chapter II outlined the hypotheses that were developed for empirical testing. The theoretical foundations of the hypotheses were also identified and established. The empirical testing of the hypotheses involved a series of T-tests to examine differences in mean overseas activity forms and levels between the Prospector and Defender groups of firms. Based on the group membership and identification of strategic orientation of the constituent firms developed through the clustering process, a series of T-tests were performed. A discussion of the individual hypothesis testing results follows.

Hypothesis 1

Prospector organizations will have a significantly larger number of overseas R&D facilities than Defender organizations.

Based on the logic that Prospector firms would seek to build on their distinctive competences in research, the above hypothesis predicted a greater depth of R&D activity for Prospector firms. This hypothesis was tested using a directional paired t-test. As reported in Table 4H, the Prospector group operated a significantly larger number of R&D facilities than the Defender group.

Table 4H
Results of One-tailed Paired t-Tests for differences in number of R&D facilities between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FRDFCL	Prospector	14	4.2143	7.080	p < 0.001	Yes
	Defender	28	0.6071			

FRDFCL = Number of overseas R&D facilities.

Hypothesis 2

Prospector organizations will have R&D facilities spread over a significantly larger number of countries than Defender organizations.

Since Prospector firms need to monitor technological developments both within and outside their home country, it was hypothesized that they would spread their R&D facilities over a larger number of countries. As predicted, the Prospector group operated R&D facilities in a larger number of countries than the Defender group ($p < 0.001$). Table 4I presents the results of this t-test. It must be mentioned here that no additional analysis of country type was necessary because, as mentioned earlier, almost all companies operated R&D facilities only in the developed countries in Western Europe or Japan. Therefore, controlling for country type to establish technological comparability was unnecessary.

Table 4I
Results of One-tailed Paired t-Tests for differences in number of R&D countries between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FRDCTR	Prospector	14	3.8571	7.950	p < 0.001	Yes
	Defender	28	0.6071			

FRDCTR = Number of countries where R&D facilities are located.

Hypothesis 3

Defender organizations will operate a significantly larger number of overseas production facilities than Prospector organizations.

In keeping with the efficiency orientation of Defender firms, they were expected to have a greater number of manufacturing plants overseas. Results of the t-test for this hypothesis did not provide support. As Table 4J indicates, the Prospector group operated a larger number of overseas production facilities than Defender firms ($p < 0.001$). Thus this hypothesis was not supported. Further testing was carried out to explore the reason behind this finding. A detailed discussion of additional testing results are reported later in this Chapter.

Table 4J
Results of One-tailed Paired t-Tests for differences in number of
plants between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FPLANT	Prospector	14	35.5714	5.690	p < 0.001	No
	Defender	28	3.3929			

FPLANT = Number of overseas manufacturing plants.

Hypothesis 4

Prospector organizations will operate a significantly larger number of sales facilities than Defender organizations.

Based on a need for rapid responses to markets, Prospector firms were predicted to have a larger number of sales outlets than Defender firms. Results of the t-test for this hypothesis provide support for this prediction. The Prospector group had a significantly larger number of overseas sales facilities than the Defender group ($p < 0.001$). Thus this hypothesis was supported. Table 4K provides the results of this t-test.

Table 4K
Results of One-tailed Paired t-Tests for differences in number of sales offices between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FSOFCL	Prospector	14	54.500	10.410	p < 0.001	Yes
	Defender	28	4.821			

FSOFCL = Number of overseas sales facilities.

Hypothesis 5

Prospector organizations will have sales facilities spread over a significantly larger number of countries than Defender organizations.

Due to an emphasis of market accessibility and responsiveness over cost efficiency, Propsector firms were predicted to locate sales offices a larger number of countries. Results of the t-test for this hypothesis provide support for the prediction. The Propsector group operated sales facilities in a significantly larger number of overseas locations than the Defender group ($p < 0.001$). Thus this hypothesis was supported. Table 4L provides the results of this t-test.

Table 4L
Results of One-tailed Paired t-Tests for differences in number of sales office countries between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FSOCTR	Prospector	14	36.142	11.350	p < 0.001	Yes
	Defender	28	4.142			

FSOCTR = Number of countries where firm has sales offices.

Hypothesis 6

Prospector organizations will sell their products in a significantly larger number of countries than Defender organizations.

Due their reliance on a wider geographic domain, it was predicted that Prospector firms will sell their products in a larger number of countries. The results of the t-test provide support for this hypothesis. The Prospector group sold its products in a significantly larger number of countries than the Defender group ($p < 0.001$). Table 4M provides the results of this t-test.

Table 4M
Results of One-tailed Paired t-Tests for differences in number of sales countries between Prospector and Defender firms

Variable	Group	n	Mean	t value	p value	In Expected Direction
FSLCTR	Prospector	14	108.857	9.140	p < 0.001	Yes
	Defender	28	29.148			

FSLCTR = Number of countries where firm sells its products.

In summary, five out of the six hypothesized relationships were supported. It was found that the Prospector group had extensive overseas R&D and sales activities as hypothesized. The only hypothesis that did not find statistical support related to manufacturing activities of Defender firms. In order to explore this specific relationship further, additional testing was necessary. A discussion of these tests follows.

Additional Testing Procedures

As was mentioned in Chapter II, age was found to be a significant predictor of intent to internationalize in one study carried out by Horst (1972). Although that study was across industries, the finding may have some bearing on the lack of support for Hypothesis 3. Since size of the firm was adequately controlled for through the use of ratio measures, the results could not have been confounded by size effects. Therefore, further examination was focused on age alone. A small group of studies in strategy have reported that age has a significant bearing on the strategic orientation of the firm itself (McDaniel & Kolari, 1987). Interpreting these findings in the light of the lack of significant mean differences for Hypothesis 3, interactive and independent effects of age on each of the overseas activity variables were explored.

A series of Ordinary Least Square (OLS) regressions were performed using each foreign activity variable as the dependent variable, regressed against strategic orientation, age of the firm and the interaction of age of firm and strategic orientation. All models had R-square values between 44% to 84% indicating the explanatory power of the independent variables. Strategic orientation consistently explained between 44% to 76% of the variance in the foreign activity variables adding further credence to the theoretical contention that strategy could predict overseas activity. The interaction term

(strategic orientation x age) was not significant in any of the models tested ruling out the possibility that age influences strategy and thereby influences foreign activity. Regressions of foreign activity variables against strategic orientation and age of the firm, revealed that strategy consistently accounted for a larger proportion of the total variance. However, age of the firm was found to have a significant independent effect in four of the six models that were tested. It explained between 2% to 8% of the total variance. It was also observed that strategy had the least predictive ability in predicting overseas manufacturing activity. Table 4N reports the results of multiple linear regressions. These results relate to regressions of foreign activity variables (dependents) against strategic orientation and age of the firm (independents).

Table 4N
Results of Linear Regressions of Age of Firm and Strategic Orientation
against foreign activity variables

Dependent Variable	Independent Variable	β value	Partial R-square	Prob > F
FRDFCL	STRATEGY	3.607	0.55	0.0001
	AGE	-	-	N.S
FRDCTR	STRATEGY	2.695	0.61	0.0001
	AGE	0.010	0.02	0.1164
FPLANT	STRATEGY	32.178	0.44	0.0001
	AGE	-	-	N.S
FSOFCL	STRATEGY	39.868	0.73	0.0001
	AGE	0.185	0.03	0.0150
FSOCTR	STRATEGY	22.974	0.76	0.0001
	AGE	0.170	0.08	0.0001
FSLCTR	STRATEGY	63.157	0.76	0.0001
	AGE	0.318	0.04	0.0237

FRDFCL : Number of overseas R&D facilities

FRDCTR : Number of countries where R&D facilities are located

FPLANT : Number of overseas manufacturing plants

FSOFCL : Number of overseas sales facilities

FSOCTR : Number of countries where firm has its own sales offices

FSLCTR : Number of countries where firm sells its products

This finding corroborates the findings of Horst (1972). To establish a firmer test of the hypotheses it would therefore be necessary to either, (a) control for age by choosing cohorts with similar age distribution within the two groups, or (b) partial the effect of age using other techniques. In order to do this, the age distribution of the firms was examined. Analysis revealed that Prospector firms were older than Defender firms although the mean difference in ages was not statistically significant. Developing cohorts of firms with similar ages was not considered feasible due to the small cell sizes. Sample size proved to be a restraining factor in using other techniques as well. The significant finding of the additional testing that was carried out was that age may be playing a secondary role to strategy in directing nature of overseas activity. Further, the finding that strategy explained a rather high proportion of variance in the overseas activity variables affirmed the theoretical contentions developed in Chapter II and also lent support to the findings generated through other testing methods.

Effect Size Estimation

Estimation of effect sizes was carried out using data obtained from the regression models. Effect size coefficient η is determined by the square root of the variance explained by the independent variable and can be used to interpret the strength or size of the association (Rosenthal & Rosnow, 1984). Using sums of squares data, this coefficient was computed. Separate models were derived for every individual foreign activity variable. Table 4O reports the effects sizes for all the relationships that were examined.

Table 40

Effect size coefficients for main effects

MEASURE	EFFECT SIZE (η)
R&D Facilities	0.745
R&D Countries	0.782
Mfg.Plants	0.668
Sales offices	0.854
Sales offices countries	0.875
Sales countries	0.681

Note:

Main effects relate to strategic orientation and overseas activity. Interaction effects were not significant.

$$\text{Effect size estimate } (\eta) = \sqrt{\frac{SS_{Effect}}{SS_{Effect} + SS_{Error}}}$$

Coefficient η in each of the cases outlined in the table indicates the strength of the association between strategic orientation and several overseas activity variables, each considered separately. As can be seen from Table 4O, the effect sizes that were detected were quite large, ranging between 0.67 to 0.88. It may be noted that the effect size is the smallest in the case of the association between strategic orientation and number of overseas manufacturing plants. These effect sizes suggest that detection of associations between strategy and overseas activity should be possible even in relatively small samples that allow the use of parametric statistics. Results reported in Table 4N underscore the potential significance of age of the firm in influencing the nature and extent of some forms of overseas activity.

Summary

This chapter discussed the operational aspects of the methodological framework set out in Chapter III. To recapitulate, objective secondary data were used to develop measures of strategy and multinationality. Upon establishment of the reliability and construct validity of the measures, strategy data were cluster analyzed using two different techniques. Both methods provided very similar results indicating the stability of the clusters derived. External validation of the strategy types was carried out using measures that were not used in deriving the clusters. Hypotheses testing was carried out through a series of one tailed t-tests. Results of these t-tests provided support for five of the six hypothesized relationships. Table 4P provides a summary of all t-test results. Effect size computations further indicated that the relationship between strategic orientation and multinationality were quite strong. In the next chapter, these findings are assessed in

terms of their significance. The limitations of this study and future extensions of this line of research are also articulated.

Table 4P

Summary of Results from the Test of Hypotheses

Hypothesis	Supported
H1: Prospector organizations will have a significantly larger number of overseas R&D facilities than Defender organizations.	Yes
H2: Prospector organizations will have R&D facilities spread over a significantly larger number of countries than Defender organizations.	Yes
H3: Defender organizations will operate a significantly larger number of overseas production facilities than Prospector organizations.	No
H4: Prospector organizations will operate a significantly larger number of sales offices than Defender organizations.	Yes
H5: Prospector organizations will have sales facilities spread over a significantly larger number of countries than Defender organizations.	Yes
H6: Prospector organizations will sell their products in a significantly larger number of countries than Defender organizations.	Yes

Chapter V: Discussion and Conclusions

This study empirically examined the relationship between strategic orientation of organizations and the nature of overseas activities that they pursue. The core objective of the study was to explore the existence of patterns of multinationality that could be traced to variations in dominant strategic orientations. In exploring these issues, the study used objective data from one single industry setting - the Drugs & Pharmaceuticals industry. Statistical analysis procedures helped unravel linkages that were theorized to exist. The results obtained provided support for most of the key hypotheses developed for testing. In this chapter, the results of each hypothesis test is discussed in detail. The theoretical and practical significance of each hypothesis is outlined and related to the larger body of strategic management literature. Building on the findings of this empirical study, several directions for future research in the field are also articulated. The chapter ends with an identification of the contributions made by the study.

Theoretical synopsis

The theoretical underpinnings of the study can be traced back to the notion of distinctive competences that are associated with every viable strategic orientation. Literature in the field of strategic management suggests that organizations possess unique

skills which they seek to build upon in attaining sustainable competitive advantage (Andrews, 1971; Ansoff, 1965; Miles & Snow, 1978). In his seminal work on strategy, Ansoff (1965) suggested that firms seek to build on their distinctive competences as a means of attaining growth objectives. This notion, referred to as 'the common thread' reflects the idea that firms continue to do that what they are best equipped to do. This logic is central to the field of strategy and is exemplified by almost all researchers in the field (Andrews, 1971; Hofer & Schendel, 1978; Porter, 1980; Snow & Hrebiniak, 1980). Building on this central notion, this study set out theoretical relationships between strategy and multinationality.

Multinationality was defined along three system functions namely input, process and output. Organizations operating overseas exhibit considerable divergence in terms of the nature and emphasis of activities as they relate to any single system function. In other words, it was observed that two organizations operating within the same context could have very different profiles of overseas activity. This variation in profile was theorized to be a function of the dominant strategic orientation of organization. The central argument behind the study suggested that a firms strategic orientation and the distinctive competences that it embodies will direct the nature and variety of activities that the organization pursues overseas.

This line of reasoning represents a radical departure from the conventional arguments prevalent in the field of international business. The field has been dominated by economic thought which suggests that a variety of deterministic factors such as cost variations, and resource access are key motivators behind the internationalization process. However, evidence of this logic is contradictory. As was reviewed in Chapter II, an appraisal of a population of firms operating overseas does not provide much support for the economists' line of thought. Therefore, it seemed necessary to explore alterna-

tive perspectives that could explain the process more adequately. In this regard, the notion of distinctive competence and strategic orientation seemed capable of providing the critical insight that the field lacked. Further, no study has thus far integrated the notion of strategy into an explanatory framework that examines international activities pursued by firms. Building on the strategic orientation approach, this study tested several hypotheses. A detailed discussion of these hypotheses follows.

Hypothesis 1-2

The first pair of testable hypotheses related to the Prospector orientation and their emphasis on research and development activity overseas (input function). Stated in general form:

Prospector organizations will have a significantly larger number of overseas R&D facilities than Defender organizations.

Prospector organizations will have R&D facilities spread over a significantly larger number of countries than Defender organizations.

The first hypothesis relates to the depth component of multinationality while the second relates to the configuration component. The depth hypothesis was substantiated by the fact that Prospector firms rely on product development as a source of competitive advantage (Snow & Hrebiniak, 1980). Therefore they were expected to exhibit higher levels of activity along this system function. The configuration hypothesis was substantiated by the unique scanning capacities of the Prospector organizations that are necessary to be able to monitor developments in technology in various country contexts.

The results of the t-tests relating to these hypotheses provide significant statistical support. In general terms, these tests provide empirical support for the contention that

organizations tend to build on their distinctive competences to establish competitive advantage and that Prospector organizations, in keeping with their competence in R&D, tend to establish a larger number of research facilities in a larger number of countries. Further, it was found that the location of these activities were restricted to developed countries with only two exceptions where two companies had research facilities in Australia and Brazil. In essence, these tests suggest that strategic orientation is a robust predictor of both depth and configuration elements of overseas research activity (input function). The strength of this relationship is underscored by the relatively large effect sizes ($\eta = 0.74$ and 0.78). The findings correspond to previous empirical studies that explored the implications of overseas R&D activity (Behrman & Fischer, 1980). Besides providing empirical support to the "common thread" notion, these findings reiterate the extent of voluntaristic choice that is possible even in environments that have a relatively high degree of constraints such as trade barriers etc.

Hypothesis 3

The third hypothesis related to the Defender organization and their emphasis on production activities overseas. Stated in general form

Defender organizations will operate a significantly larger number of overseas production facilities than Prospector organizations.

It has been suggested that Defender organizations primarily compete on the basis of cost efficiency. Their distinctive competences include process engineering, cost control and finance all of which are efficiency oriented functions.

Results of the t-test relating to this hypothesis did not provide empirical support. Contrarily, it was found that Prospector organizations had a larger number of overseas

production facilities. In order to explore the lack of support for this hypothesis, several regression models were tested. It was found that the age of an organization had an independent and direct bearing on many forms of overseas activity. Therefore a true test of the hypotheses would require a factoring of age related effects. Since this is possible only through a cohort analysis of firms with fairly similar age distributions, it could not be accomplished within the context of this study. The small sample size constrained such an analysis.

While it may indeed be true that Defender organizations tend to emphasize overseas production, it is also likely that establishment of such activity will be a function of time. Perhaps it is far more easier to establish an overseas R&D facility or sales facility than it is to establish a production plant. At a minimum, overseas production requires far more commitment and investment than other alternative forms of overseas activity. Therefore, a test of the hypothesis on a sample of firms with dissimilar age distributions might not provide an accurate assessment. The test itself would be confounded by age effects.

An analysis of the location patterns of overseas production facilities revealed that a very large proportion of firms had manufacturing facilities in developed countries. This finding challenges the conventional economics view which would argue that firms locate overseas production facilities in order to realise cost advantages (Dymsza, 1972; Kogut, 1985; Porter, 1986). If this line of reasoning were to be true, then all firms must have located their production facilities in the Far East where costs are low rather than Western Europe where costs are high. This finding therefore has major theoretical import. It suggests that comparative cost approaches may not be able to provide a holistic picture of the overseas location decision.

It is essential to examine a multiplicity of variables that could explain the location of production facilities overseas. Industry level characteristics such as the nature of the production process could have considerable influence over foreign production decisions. The pharmaceutical industry is similar to most other chemical processing industries. The production process is not labor intensive. Further, transportation costs may not be very significant because of the nature of end products produced. Due to these reasons, a firm in this industry may not be able to realize considerable cost economies by locating manufacturing facilities overseas.

Factors such as intellectual property protection and patent laws in various overseas locations could also limit foreign production in this industry. Many Asian and Latin American countries that are characterized by low labor costs do not have adequate patent protection laws. A firm locating its manufacturing facility in one of these regions would therefore be opening itself to serious risks of technology pilferage. These arguments, when juxtaposed with the lack of statistical support for Hypothesis 3, underscores the need for examining many more factors that go beyond simplistic cost advantage notions.

Hypothesis 4-6

The next set of hypotheses related to Prospector organizations and their emphasis on marketing activities overseas. Stated in general form, it was hypothesized that:

Prospector organizations will operate a significantly larger number of overseas sales offices than Defender organizations.

Prospector organizations will have sales facilities spread over a significantly larger number of countries than Defender like organizations.

Prospector organizations will sell their products in a significantly larger number of countries than Defender organizations.

Prospector organizations are externally oriented and have a distinct market focus (Miles & Snow, 1978; Snow & Hrebiniak, 1980). Marketing is one of the distinctive competences that a Prospector organization is expected to build upon in attaining competitive advantage. In keeping with their competences in marketing, they would tend to establish a larger number of overseas sales offices because a widespread network is likely to provide greater customer contact than a centralized sales system. Since they also capitalize on being first-to-market, close customer contact is necessary in every country context that they operate in. Therefore, they may further be expected to spread their sales facilities over a larger number of countries than their Defender counterparts. Miles and Snow (1978) argue that Prospectors tend to operate over a wider product-market domain than Defenders. This observation can be interpreted in terms of the spread of geographic domain of Prospector organizations.

Results of the t-tests provided empirical support for these hypotheses. This provides further support to the notion of building on distinctive competences (Ansoff, 1965) in order to obtain sustainable competitive advantage. The strength of this relationship is further underscored by the large effect sizes ($\eta = 0.85, 0.87, \text{ and } 0.78$).

Implications of findings

The results of this study indicate that strategic orientation of an organization has a direct bearing on the nature and extent of activities that a firm pursues overseas. The unravelling of systematic associations between strategy type and overseas activity reiterates the strong nature of the linkage. The key implication of this finding is that strategic orientation needs to form part of any explanatory theory on internationalization processes. Thus far, most of the research in this sub-stream has concentrated upon macro-economic factors such as differential costs etc. as potential explanatory variables in theories of internationalization. However, the findings of this study directly challenge this traditional approach that looks at one slice of the realities of global businesses without considering any of the firm specific factors.

It becomes clear that firm specific factors play a key role in the internationalization processes of organizations. Perhaps it would be much more meaningful to enrich erstwhile theories of international economics by incorporating a firm specific approach as well. Current trends indicate that the field is indeed turning toward that direction (e.g., Dunning, 1988). While macro-economic factors can be explored as part of the fundamental backdrop that encourages overseas investment, firm specific factors such as strategic orientation should be incorporated as drivers that essentially determine the nature of overseas activity that a firm pursues. It may well be found that macro-economic variables and firm specific factors may exert an interactive influence on internationalization decisions or that one moderates the other. In essence, the findings of this study underscore the need to infuse an organizational perspective in theories of internationalization - something that has been neglected thus far.

Apart from being of interest to academic researchers, the empirical findings have practitioner implications as well. At a minimum, the findings suggest that managers should be cognizant of the distinctive competences of their organizations while making decisions on international business endeavors. While certain overseas opportunities may make a lot of economic sense, the organizational implications of such opportunities must be explored before decisions are made. For example, an economically viable opportunity to set up an R&D facility must be weighed against organizational competence and purpose. At a minimum, the results of this study highlight the necessity to consider all the organizational implications of all three system functions while expanding overseas. Further, the need to appraise organizational intangibles such as strategic orientation and distinctive competence is underscored.

The finding that almost all the firms examined by this study had their manufacturing facilities located predominantly in the developed countries of the world has tremendous import. It challenges the traditional comparative cost approach to evaluating foreign investment. Perhaps, managers must be aware that cheap labor, cheap transport or raw materials are not the only considerations in going overseas. If only cost considerations were primal, all the companies in this study should have shown a preference for manufacturing in Southeast Asia where overall costs tend to be lower rather than Western Europe where labor and transportation costs are high. Further, given the fact that the Japanese market is the second largest consumer of pharmaceutical products, if a company wants to sell to this large market, locating production facilities in Asia would make more economic sense. Hence the finding that companies have a preference for locating manufacturing facilities in Western Europe and the developed world, goes against the grain of hard headed economic logic. Perhaps managers would do well not

to consider cost elements alone at the neglect of various other factors such as organizational strengths while deciding on investments overseas.

Theoretical contributions of the study

Having briefly set out the theoretical and practical significance of this research effort, the following discussion evaluates the contributions of this study to the larger literature. The key contributions can be best evaluated in terms of theory and method. Following are the major theoretical contributions.

The study makes significant progress by integrating organizational theories to examine a phenomenon that has been the mainstay of international economists. In doing so, the study highlights the salience of incorporating firm specific behavioral elements into theories of internationalization. From a strategic management point of view, this study extends the domain to which organizational theories have been applied thus far. Most research using concepts from strategy literature have been restricted to empirical examinations of domestic businesses. By applying these concepts to specifically examine issues in international business, this study opens up several new avenues for research in an area that is currently witnessing meteoric growth.

That the Miles and Snow (1978) typology of strategic behavior can be used to type international organizations not only establishes the validity of the framework but also extends the domains of traditional strategic management thought on the appropriateness of typologies. This finding can be considered to have chronological significance as well. Currently many researchers are developing separate strategy typologies for examining MNCs. However, it seems far more appropriate to view MNCs as special forms of or-

ganizations rather than unique entities that lie outside the domain of contemporary research and theory on organizations. Perhaps we could tailor current theories that are being applied to domestic businesses to examine international businesses as well.

The conceptualization of multinationality along three distinct system functions namely input, process, and output has theoretical potential. This study shows that firms do indeed place varying emphasis on each function. It would be purposeful to avoid oversimplified conceptualizations such as level of overseas sales as surrogates for the extent of internationalization of firms. This study shows that sales (output) is just one function and that the other system functions need to be considered as well before making observations about the extent of overseas involvement of corporations. Such an approach could infuse greater theoretical clarity than what is available today. This has a direct bearing on the current line of studies that attempt to explore the linkage between internationalization and firm performance (e.g., Geringer, Beamish & DaCosta, 1989) using the sales dimension alone to characterize extent of internationalization.

Methodological contributions of the study

From a methodological viewpoint, this study is one of a select few that have operationalized strategic orientation using objective secondary data and perhaps one of the first studies to use multiple measures of the construct as well. Given the fact that primary measures of strategic orientation are difficult to develop and administer, the use of secondary surrogates is of greater importance. Further, the use of secondary measures provides a more accurate picture of realized strategies, a domain that holds the key to future theoretical development. Toward this end, the study provides numerous leads

in conceptualizing and operationalizing multiple measures of strategy based on information that can be accessed easily.

It also introduces some novel approaches to analyzing strategy data using clustering techniques. Of specific interest is the attempt to test for cluster stability by using dissimilar clustering algorithms, and the theoretical validation of clusters by using external measures, something that has been neglected by most previous studies. In the absence of a more accurate test of triangulation of strategy typing, this approach at least elevates current methodological practices that suffer from critical tautologies.

The development of objective indicators of multinationality is also quite unique. Most prior studies have limited themselves to exploring internationalization as a percentage of overseas sales. However, this study sheds new light by both conceptualizing and operationalizing multinationality along three system functions and further in terms of depth and configuration elements.

Suggestions for future research

It would be of interest to examine the causal patterns through which organizations establish overseas businesses. Of specific relevance would be an examination of the various alternative paths that firms choose and whether the choice of any mode of internationalization is indeed influenced by the dominant strategic orientation of the firm.

From a performance point of view, it would be beneficial to examine the profit or return implications of various different profiles of multinationality. Is overseas production more beneficial than overseas research? What are the essential conditions under which one profile provides better performance than the other? What is the nature of the

relationship between level of multinationality and performance? Does the traditional logic that more internationalization results in better performance hold under all conditions? These are questions that would have practical import to managers of multinationals.

Examination of the top management team characteristics of MNCs is another useful avenue for research. It must be examined whether administering organizations with different profiles of multinationality requires differing managerial emphasis and backgrounds. Are the top management teams of MNCs functionally different from domestic organizations? Are these differences amplified by increasing levels of international involvement?

Applying the theory of dominant logics (Prahalad & Bettis, 1986), the linkages between an organization's dominant strategic orientation, its multinationality profile, and administrative mechanisms and strategies at the subsidiary level could be a fruitful area for study. This perspective would be especially useful in studying large diversified MNCs that operate in a variety of industries.

Limitations

As with every empirical research study, this study too has its share of limitations. The crucial limitation is the trade-off that was made by controlling for industry effects by limiting the study to one industry. This leads to findings that may not be transferable to other contexts. Perhaps a replication of this study in numerous other settings would provide the validity that is required to progress towards a middle-range theory of multinational behavior.

The other limitations of the study stem from sources such as the small sample size, and research design. The small sample used for empirical analysis considerably constrained the use of many statistical procedures. The inability to develop cohort groups to examine the impact of the age of the organization is a case in point. The design of the study was cross-sectional in nature. Although such a design helps establish basic associations, temporal order cannot be deciphered. Many would argue that internationalization is a temporal movement and must be examined longitudinally. By choosing a cross-sectional design, this study is considerably limited in terms of shedding light on the causal nature of the relationships involved.

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Appendix A.

List of firms included in the sample

01. Abbot Inc.
02. Alza Corp.
03. American Home Products
04. Baxter Travenol
05. Biorad Laboratories
06. Bolar Pharmaceuticals
07. Bristol Myers
08. Carrington Laboratories
09. Carter Wallace Inc.
10. Centocor Inc.
11. Cetus Corp.
12. Chattem Inc.
13. American Cynamid
14. Eli Lilly
15. Forest Laboratories
16. Genentech Inc.
17. ICN Pharmaceuticals
18. ICN Biomedicals
19. Inter Genetics
20. Iroquois Brands
21. Johnson & Johnson
22. Lee Pharmaceuticals
23. Lyphomed
24. Marion Laboratories
25. Merck
26. Moleculon Inc.
27. Mylan Laboratories
28. Newport Pharmaceuticals
29. Pfizer Inc.
30. Robbins A.H.
31. Rorer Pharmaceuticals
32. Schering Plough
33. Shaklee Pharmaceuticals
34. Smithkline & Beckman
35. Squibb Inc.
36. Sterling
37. Synbiotics
38. Syntex Pharmaceuticals
39. Unimed Inc.
40. Warner Lambert

41. Upjohn
42. Zenith Laboratories

Curriculum Vitae

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EDUCATION

Ph.D in Strategic Management (1990)

Virginia Polytechnic Institute & State University (Virginia Tech).

Major Field: Strategic Management
Minor Field: Marketing

Master's degree in Business Administration (1984)

University of Madras, Madras, India.

Graduated from the MBA program with specializations in Corporate Finance and Foreign Trade. Was ranked among the top 5% of the graduating class.

Bachelor's degree in Science (1981)

University of Madras, Madras, India.

Graduated from the program with a major in Physics and minors in Mathematics and Chemistry.

DISSERTATION RESEARCH

Strategic Orientation, Distinctive Competence and Multinationality Profiles of Organizations:
A Strategic Management Approach

The dissertation is an empirical examination of the associative linkages between strategic orientation and multinationality profiles of firms operating overseas. Extending the strategic choice paradigm to the international context, it is theorized that the scope and nature of overseas activity pursued by a firm are functions of its strategic orientation.

RESEARCH EXPERIENCE

PUBLICATIONS

Cheng, J.L.C. & Ramaswamy, K. (1989) Toward a System Typology of Multinationals: Some Conceptual and Research Directions. **Academy of Management Best Papers Proceedings**. 106-110.

Thomas, A. & Ramaswamy, K. (1989) Executive Characteristics, Strategy and Performance: A Contingency Model. **Academy of Management Best Papers Proceedings**. 42-46.

Graduate Research Assistant (Sept., 1986 - June, 1988)

Awarded a Graduate Research Assistantship at the Department of Management which required assisting faculty with ongoing research projects and administrative duties. Significant projects executed during this period include assisting in compiling and editing the International Management Directory, published by the Academy of Management (Ed. Dr. J.L.C. Cheng), developing a questionnaire for a proposed national survey of doctoral programs in management, and drafting research publications.

RESEARCH INTERESTS

- Causes and effects of internationalization of business
- Industry life cycles and strategic orientation
- Upper echelon executives and organizational strategy and performance

TEACHING EXPERIENCE

Instructor, Department of Management (June, 1988 - Fall, 1989)

Awarded a half-time Instructorship to teach two sections of undergraduate Business Policy and Strategic Management at the senior level for five academic sessions.

Instructor, Department of Marketing (Fall, 1989 - Present)

Awarded a half-time Instructorship to teach Strategic Marketing at the senior level.

TEACHING INTERESTS

Business Policy & Strategic Management
International Management
Organization Theory
General Management
Marketing Management & Policy

BUSINESS EXPERIENCE

Senior Consultant - SAM Consultancy Services, India. (1984 - 1986)

Employed as a Senior Consultant at this leading management consultancy organization between June 1984 and July 1986. Responsibilities included designing restructuring plans for financially crippled units, examining managerial aspects of information systems, conducting feasibility studies for new ventures and evaluating foreign collaboration agreements. This exposure involved leading teams of Junior Consultants and negotiating with top management at client companies and federal financial institutions. The company had a large clientele that includes several U.S. and European multinational subsidiaries.

HONORS & AWARDS

Beta Gamma Sigma - National Honors Society in Business

PROFESSIONAL AFFILIATIONS

Academy of Management
Strategic Management Society