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An Empirical Examination of the Influence of Industry and Firm Drivers on the Rate of Internationalization by Firms

By

B. Elango

A dissertation submitted to the Graduate Faculty in Business in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York.

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Abstract

An Empirical Examination of the Influence of Industry and Firm Drivers on the Rate of Internationalization by Firms

by

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A gradual shift in U.S. firms' "center of gravity" toward international markets is taking place. This study seeks to explain which drivers are related to this push toward international markets by U.S. firms. In addressing internationalization, previous research has not focused on various drivers that influence the rate of internationalization. Drivers refer to forces, both within and outside the firm, that impact(both positively and negatively) a firm's extent of internationalization. The role of these drivers on the rate of internationalization, though acknowledged in the literature, is yet to be validated through empirical research. This research seeks to narrow the gap in the literature by testing the various relationships among industry drivers, firm drivers, and the rate of internationalization.

The objectives of this study are:

A) To develop a conceptual framework that takes into account various forces that influence the internationalization strategy of a firm;

B) To examine empirically

(a) the influence of industry drivers on the rate of internationalization pursued by firms; and,

(b) the influence of firm drivers on the rate of internationalization by firms.

The sample for this study consists of 158 large U.S.-based multinational firms drawn from seven different industries. Data for the study is gathered from a variety of sources including the U.S. Department of Commerce, Bureau of Economic Analysis; COMPUSTAT; and WORLDSCOPE databases. Set-wise regression models were used for data analysis. This study found that global market growth rate, domestic market growth rate, relative size of domestic market to international market, employee productivity, administrative investments, as well as new plant and equipment influences the international strategy of firms. This study explains about 24 percent of the variance of the rate of internationalization. This research finding is contributory to our existing understanding of internationalization in many ways. Unlike many previous studies on internationalization which attempted to explain the variance in the extent of internationalization, this study tested for the factors influencing the change in the extent of internationalization by firms.

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their lovely daughter Shurthi, and Jayanthi along with her husband Ravikumar and two wonderful sons Visagan and Abinav -- always kept me motivated so that I stay focussed in my goals. My younger sister Suganthi was always there to offer valuable love, encouragement, support and trust during testing times throughout my doctoral studies. A special thanks is also due to my wife Sasikala who was forced to go through the ordeals of completing my dissertation during the first few weeks of our marriage.

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Chapter 1

Introduction and Research Questions

This chapter explains why the relationship between industry and firm drivers, and their influence on the rate of internationalization by firms needs to be investigated. Later, the expected contribution of this study is described. This chapter concludes with an overview of how this dissertation is structured along with its potential limitations.

Overview

The last two decades have been marked by an increasing trend in internationalization of products and services as well as by direct foreign investments. For example, the total value of imports and of foreign investments in the U.S., which were at $14,700 million and $6,910 million dollars in 1960, respectively, increased to $758,036 million and $178,003 million, respectively, in 1992 (U.S. Department of Commerce, 1982; 1993). From a strategic perspective, this trend requires firms to operate beyond their national boundaries in order to remain competitive. It also creates a need for firms to consider both markets and competitors globally.

Internationalization, in general, has been used both to refer to the degree to which a firm operates internationally (e.g., Grant, 1987; Daniels & Bracker,

1989), and to the process of a firm expanding its operations from a primarily domestic to an international orientation (Anderson, 1993; Johanson and Vahlne, 1977). This paper uses the term internationalization to indicate the degree to which a firm's sales revenue, profits, or operations are gained and conducted from outside the home country of the firm.

Internationalization changes the character and expands the magnitude of strategic options available to firms when compared to those firms that operate purely domestically. The added strategic options include: greater economies of scale and scope; rationalization of production and distribution logistics; greater access to factors of production; intra-firm and cross-border transfer of physical and human resources; sales stabilization; transfer pricing; cross-subsidization; and greater, as well as more expeditious, exploitation of technology. Much research has been carried out on factors influencing the extent of internationalization. This research, though useful and insightful, has left some unexplored avenues.

Focus of Research

The focus of this study will be on corporate strategy and will emphasize one aspect/element of corporate strategy (the rate of internationalization by a firm). Briefly stated, this study will test for linkages among the different firm and industry characteristics that influence a firm's rate of internationalization. It is suggested that in addressing internationalization, previous research has not

focused on various drivers that influence the rate of internationalization by firms. Drivers refer to forces, both within and outside the firm, that impact -- both positively and negatively -- a firm's extent of internationalization. The role of these drivers on the rate of internationalization, though acknowledged in the literature (e.g., Yip, Loewe, Yoshino, 1988), is yet to be validated through empirical research. This research seeks to narrow the gap in the literature by testing the various relationship among industry drivers, firm drivers, and the rate of internationalization. The objectives of this study are:

A) *To develop a conceptual framework that takes into account various forces that influence the internationalization strategy of a firm;*

B) *To examine empirically*

   (a) *the influence of industry drivers on the rate of internationalization pursued by firms; and,*

   (b) *the influence of firm drivers on the rate of internationalization by firms.*

Expected Contribution of this Research

The identification of the industry and corporate characteristics that influence the rate of internationalization and an empirical examination of these factors, as proposed here, will have many practical implications. The findings of this study could help in determining the importance of industry and corporate characteristics in formulating international strategies. For example, many studies recommend that firms need to internationalize to gain inherent benefits. These

recommendations usually have been made without empirically testing the influence of industry and corporate characteristics. This study will provide a better understanding of internationalization. Secondly, this study will also clarify the relationship between the size of the domestic market and internationalization. This will help managers understand the influence of the domestic market/industry context when planning internationalization of their business operations. Theoretically, this study will help clarify the conceptual linkages or "relationships" (Lirtzman, 1990: pg.9) with respect to internationalization drivers.

Plan of This Dissertation

This dissertation is divided into six chapters inclusive of this first introductory chapter. Chapter 2 seeks to briefly review related scholarly literature pertaining to the current study. First, academic literature pertaining to this study will be placed in a broad conceptual framework and the various elements and linkages of the framework will be explained. Secondly, potential benefits that a firm may gain through internationalization are reviewed. Finally, this chapter concludes with a critique of the various measures of internationalization.

In Chapter 3 the theoretical foundations of the proposed research model are presented. Hypotheses are developed to investigate for the relationships between industry and firm drivers and rate of internationalization of firms.

In Chapter 4 the research design and methodology of this research are

provided. This chapter initially explains the process of selection of sample. The chapter also explains the measures and operationalization of constructs used in this study. This chapter also offers a brief explanation of the statistical methodology that will be used for data analysis. Finally, descriptive statistics of this study's sample are provided.

In Chapter 5 the major findings of this study are presented. The implication of these findings, with regard to support of the general framework, are discussed. The influence of industry and corporate characteristics in influencing patterns of internationalization of a firm is also analyzed.

Chapter 6 concludes with a discussion of the theoretical and practical implications of this research. Suggestions for future research are also provided.

Chapter 2

Development of a Conceptual Framework

This chapter develops a conceptual framework for the study. Secondly, potential benefits which could arise from internationalization and its linkage with performance are discussed. Later, empirical measures of internationalization are reviewed and critiqued.

Overview

The chapter develops a holistic framework for the study. The goal of the developed framework is to "... match the complexity of the phenomenon with equally realistic and comprehensive conceptual and analytical imagination" (Sheth and Sethi, 1977; p. 369). This framework intends to integrate previous research on the factors influencing international strategy into a single framework. It is hoped that such a integrated framework will be of value for future testing and validation. This framework will serve as the basis for the development of a testable model in the next chapter. As the research model developed in Chapter 3 will be limited to a set of variables derived from the framework, the review of literature in this chapter will be limited to the elements of the current study.

CONCEPTUAL FRAMEWORK

The perspective of the framework presented here is that of a corporate home office developing a strategy of internationalization. The strategic choices of a firm are influenced by three distinct and yet interrelated factors. Characteristics emanating from the firm's internal resources, when combined with its institutional memory and organizational culture, define the physical and institutional parameters of its strategic choices. Another set of characteristics a firm deals with in a global competitive environment is its industry structure on both a global and a domestic level. Third, the set of characteristics related to Country of Origin Effect (COE) also effects a firm's choices.

In the international arena, the firm must contend with two strong and often conflicting forces. First, the need to develop a globally focussed strategy so as to maximize its scale economies and minimize transaction costs through the integration of its worldwide operations (Hill, Hwang and Kim, 1990; Porter, 1980, 1985). This drive toward integration is forced by, among other things, the nature of competition and industry structure, and considerations of technology. Second, the forces of fragmentation, are rooted in, among others, geo-political considerations, cultural constraints, and the bargaining leverage of host countries. A firm's international environment, nevertheless, consists of multiple national environments that differentially impact the firm's organizational structure, locus of decision-making, human resource management, and communication channels and information processing (Rosenzweig and Singh, 1991) in ways that

are both complex and non-additive. A simplified framework outlining the firm's strategic process is provided in Figure 2.1. The following section will describe different components of the framework along with its underlying logic.

Global Environmental Influences

Global environmental influences refer to political, trading, and socio-economic changes which define, constrain, or open opportunities for a firm operating in an global environment. A firm's competitive advantage in an international setting is not absolute, but is relative to these forces. Therefore, a firm's ability to profit from international operations will be subject to the influence of these forces. In a single country environment, all companies operate in a common socio-political context and share the benefits/costs of the environment they are operating in. For a firm operating in a global context, the willingness and the ability of host countries to influence global business conditions should also be factored in along with the environmental forces when formulating international strategies.

Firm Characteristics

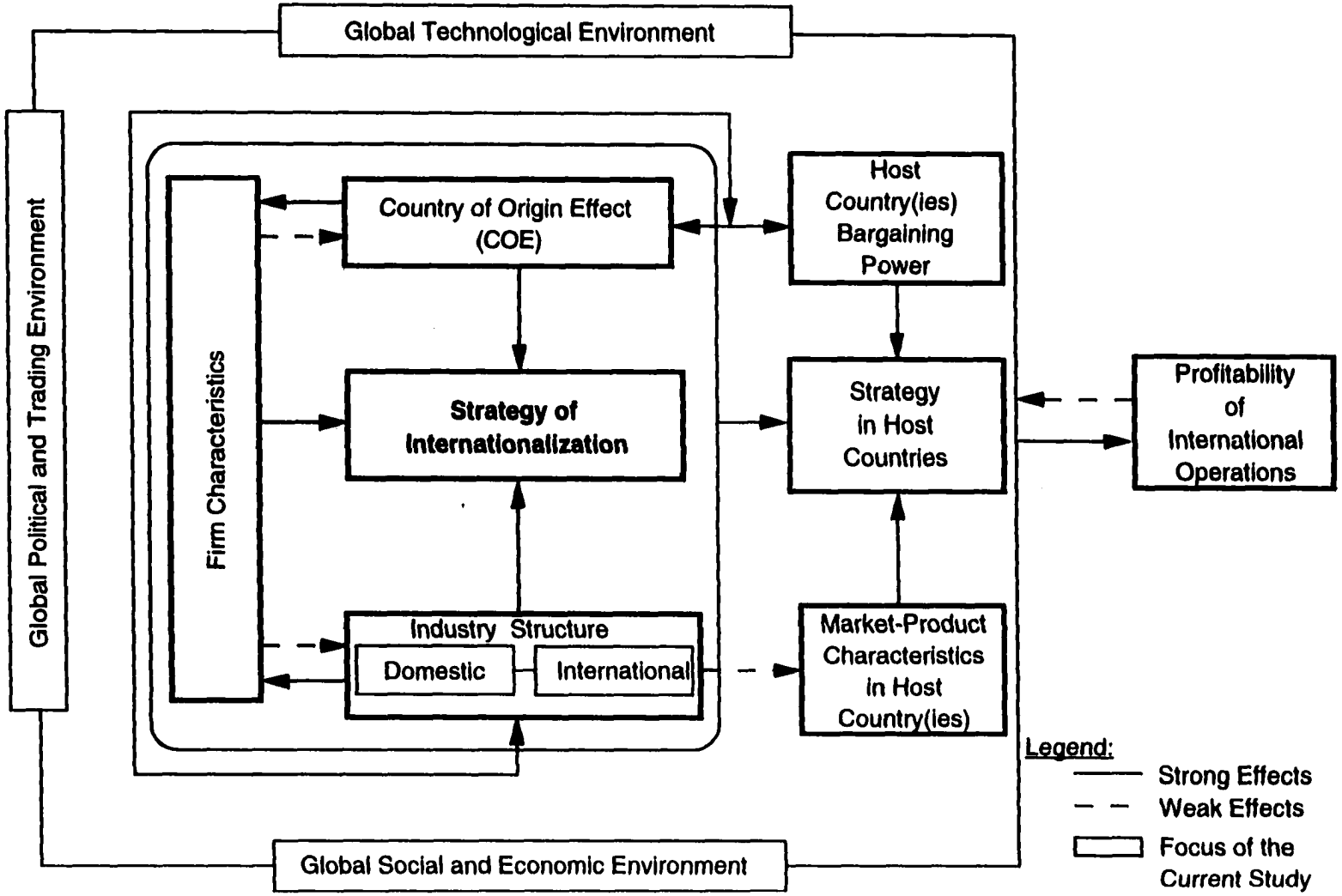
A firm's resource characteristics provide it with the opportunities to gain competitive advantage in the marketplace. Firm resources include all assets, capabilities, organizational processes, firm attributes, knowledge, etc. that are controlled by the firm and thereby enable it to conceive and implement a

particular strategy, improve operational efficiency, and enhance its financial performance (Collis, 1991). Firms create differences through astute combination of physical and human resources, corporate culture and institutional memory, and managerial characteristics and styles, in a manner that would yield for them unique competitive advantage. To the extent that these factors create resources that are important to succeed in the marketplace, and are not commonly shared, they confer specific competitive advantages to the particular firm.

Industry Structure

A firm operating in a global environment needs to face the influence of industry structure both at a global level and at a domestic level. Domestic industry structure in general "refers to certain stable attributes of the market that influence the firm's conduct in the marketplace" (Caves, 1980: pg.64). At a superficial level, global industry structure can be characterized in terms of total industry sales and the distribution of relative market shares among various competing firms -- a definition that is similar to industry structure conditions within a single country. Global industry structure, however, has certain unique characteristics that render such a definition of limited practical value. International markets, in reality, are collections of multiple domestic markets with their own set of structural and institutional rigidities with varying interactive effects on the MNC resources --both COE and firm-based-- in terms of their competitive saliency in individual markets (Porter, 1986).

Figure 2.1: Conceptual Framework Linking Various Elements To A Firm's Strategy Of Internationalization



Country of Origin Effect

Firms from a particular country are likely to exhibit profile similarities that are distinct from those of firms originating in a different country. These profile similarities accrue from home country attributes that lend certain advantages to these firms and influence their strategic choices are referred to as "country of origin effect" (COE) (henceforth referred to as COE: Sethi and Elango, 1995). COE elements affecting an MNC's strategic choices and operational behavior are grouped into three categories: country resources and governmental policies; cultural values and managerial orientation; and organization of economic activity.

Country Resources are: (1) factor endowments that underlie its economic resources and wealth producing activities; (2) legal and political structures that provide the wherewithal of a stable socio-political order conducive to productive economic activity; (3) accumulated wealth of skills and knowledge in the society, e.g., capabilities in investment and financing; manufacturing and production; and marketing and promotion; (4) linkage capabilities, i.e., skills needed to transform information and technology; and (5) skill levels of its workforce (Lall, 1992; Nelson, 1987; Porter, 1985). Both economic and non-economic organizations in a nation draw upon these tangible and intangible resources by internalizing them and thereby making their own operations more efficient and cost effective. At the same time, the spillover effect of their actions contribute to the buildup of a society's resources.

Cultural Values and Managerial Orientation pertain to a society's

ingrained set of cultural norms and social values that provide (1) the underpinnings of legal and political standards acceptable to society as fair and just; and (2) societal expectations of behavioral norms by individuals and institutions in economic and socio-political exchanges (Adler, 1991; Franke, Hofstede, and Bond, 1991; Jaeger, 1986; Shane, 1994). A society's culture has considerable influence in structuring human organizations and influencing individual values and behavior. Culture impacts the types of incentives and constraints that would be considered acceptable in organizing and ordering human activity. Organizational activities that are compatible with a society's cultural norms yield greater productivity and reward for the organization and thereby reinforce those values. Thus, managerial values of corporations in a particular society must necessarily reflect the cultural values of that society.

Organization of Economic Activity in a society is naturally influenced by factor endowments of that society, its legal and political systems, and the cultural norms that shape individual expectations (Hofstede, 1980; Murtha and Lenway, 1994; Porter, 1990). Economic organizations order their activities to make the best use of external societal factors and a firm's resources so as to gain competitive advantage in domestic and global markets. These considerations would affect, among others, level of industrial concentration; rights and obligations of managers and various other stakeholders in a corporation; protection of intellectual property and rapid exchange of technology; rules of competition and regulatory behavior; and entry-exit barriers, to name a few.

They will also influence the type of organizational structure and decision-making process.

Strategy of Internationalization

A firm's internationalization strategy refers to the product/market/ competitive choices made by the firm while entering and competing in the international marketplace. A firm's strategy of internationalization includes, among others, (1) its growth, market share and performance targets; (2) control over and dissemination of its technologies; (3) product, investment and geographical diversification; (4) considerations of risk and the time horizon; and (5) strategic adaptation to foreign market needs that a company is willing to accept in establishing a strategic hold in a country or a regional market.

In brief, international strategy encompasses all aspects of the firm's strategy choices outside its domestic markets as to: entry mode (exporting, licensing, franchising, joint ventures or wholly owned subsidiaries); technology transfer; type of organization structure (centralized, federated hub, transnational); location of value activities and production shifting/sharing; tax minimization; sharing assets/learning/R&D; intra-firm transfer; risk management; size distribution (exposure to international markets versus its domestic market); locus of decision-making; human resource management; and communication channels and information processing (e.g., Rosenzweig and Singh, 1991). Firms

can use any combinations of the various strategy choices while internationalizing. For example, firms such as GE hope that growing markets in India, China and Mexico will account for 25% of revenues early in the next century. GE is attempting to achieve its growth goals by expanding in various industries, through a variety of methods which include direct investment, licensing, joint venture, and financing. The focus of this study will be on one of the dimensions of the strategy of internationalization, i.e., the rate of internationalization.

Host Country Bargaining Power

Host country bargaining power emanates from, among others, (1) a country's physical and human resources, and its market size; (2) the extent to which these resources and market size are prized by a particular MNC; and, (3) the extent to which an MNC's particular technological, financial and market power related strengths are desired by the host country. This bargaining power provides the host country the wherewithal to influence an MNC's global strategy in ways that are beneficial to the needs of the host country (Boddewyn and Brewer, 1994; de la Torre and Neckar, 1990; Lecraw, 1984; Lindblom, 1977; Lodge, 1980; Lenway and Murtha, 1994; Moran, 1973, 1985; Ring, Lenway and Govekar, 1990).

Market/Product Characteristics of a Host Country

Notwithstanding the dominant characteristics of an industry's global structure, there may still be market/product characteristics that are unique to a particular country and must be taken into account by an MNC even though such considerations may adversely affect its global production or market efficiencies. These adverse conditions must be offset by additional opportunities for sales growth and profit gains in that country. Market/Product characteristics include, among others, (1) the extent of market concentration and protection of domestic producers; (2) intensity of competition and regulatory environment; (3) rate of technology diffusion; and, (4) customer tastes and buying preferences (Doz, 1980; Porter, 1985).

MNC Host Country Strategy

This construct refers to the individual country sub-set of an MNC's global strategy. It incorporates considerations of a host country such as source of raw materials, cheap labor, manufacturing platforms, and a market for the MNC's products and services. This construct also includes host country conditions and the extent to which the MNC's strategy in a particular country is modified, i.e., country focused, in response to that country's relative bargaining power vis-a-vis that MNC. An important consideration in this approach has to do with the nature of product and industry and whether it is more driven by universal economic or technological considerations, or whether market share and firm profits are more

dictated by unique customer needs in individual countries or regions (Bartlett and Ghoshal, 1989; Doz, 1986; Porter, 1980).

A systemic analysis of different types of MNC strategies used in host countries is lacking. Notwithstanding the dominant characteristics of an industry's global structure, there may still be market/product characteristics that are unique to a particular country and must be taken into account by an MNC regardless of the fact that such considerations may adversely affect its global production or market efficiencies so long as these adverse conditions are offset by additional opportunities available for sales growth and profit gains in that country. Market/product characteristics include, among others, (1) the extent of market concentration and protection of domestic producers; (2) intensity of competition and regulatory environment; (3) rate of technology diffusion; and, (4) customer tastes and buying preferences (Doz, 1980; Porter, 1985).

A more rigorous theoretical perspective is not available that takes into account among other things product life cycle theory, global expansion, industry structure, characteristics of company, technology diffusion, economics of scale involved, home and host characteristics and bargaining power to indicate the type of strategies a firm will undertake. However, one approach, to classifying MNC strategies in host countries is offered by Sethi, Namiki, and Swanson (1984). It should be noted that the classification scheme was developed in the context of Japanese investment in the United States though it is applicable to other situations. Briefly described (Adapted from Sethi, Namiki, and Swanson,

1984):

Imperialist Approach. In this approach the MNC tries to clone its home operation to the maximum extent possible in various host countries. This system is maintained with high cohesiveness and similarity so that each subsidiary will react in a manner similar to that of its parent under a given set of circumstances.

Enclave Approach. The enclave approach involves setting up operations in fairly small and isolated parts of the country. This approach makes great effort to integrate local employees in to the system without many changes from the parent system in the home country.

Domestication Approach. This approach is that of strategic adaptation, which aims to alter the linkages between the firm and the environment. In this approach the firm attempts to devise new linkages to interact with the environment so that friction is minimized.

Acculturation Approach. The acculturation approach attempts to transfer home country practices and systems to host country. The acculturation approach involves carefully screening employees and cultivating them to accept practices which are prevalent in the home nation of the firm. This approach emphasizes indirect indoctrination compared to the imperialist approach which is direct and forced on employees.

The preceding section gave a brief description of each of the elements and various linkages of the framework. The framework and its underlying logic will serve as the basis for this study. The following section will explain what

potential benefits a firm might gain through internationalization.

POTENTIAL BENEFITS FROM INTERNATIONALIZATION

Researchers have argued that internationalization offers many benefits. These benefits are drawn from normative literature. It should be noted that these potential benefits were developed independently of existing theoretical explanations (discussed in chapter 3) as to why firms operate internationally (Hymer, 1976). These benefits include:

Scope and scale advantages. Economies of scale and scope refer to cost advantages gained by firms due to large size and the ability to share costs over similar product lines (Hill and Jones, 1992). Firms operating internationally will be able to benefit from economies of scale and scope which might otherwise not be possible by operating in domestic markets alone (Porter, 1985). In certain industries, e.g., aero-engines and airframes, where economies of scale are high, firms are required to have some degree of global integration of operations (Ghoshal, 1987). These scale and scope advantages can accrue to a firm in a number of ways. First, firms operating in international markets will not be constricted by the size of the domestic market. Second, the firm will benefit from interrelationships between products across various countries (Porter, 1985). Third, a firm will be able to internalize a greater portion of its value activities to its advantage through intra-firm transfer or other means (Rugman, 1981).

Cross-subsidization. Operating in many countries gives the firm the ability

to cross-subsidize across various markets to gain market share (Hamel and Prahalad, 1985). For instance, a firm operating internationally can practice cross-subsidization by charging higher prices to customers of one nation, while at the same time selling products at lower prices to customers of another nations. Hence customers from one nation subsidize customers of other nations to the benefit of the firm. Examples of firms practicing cross-subsidization include Mazda (in the case of its MPV) where U.S. courts have ruled that Mazda is guilty of practicing cross-subsidization in the U.S. to gain market share.

Factor Advantages. Firms operating internationally will also be able to exploit factor advantages of various countries. Some of these advantages include availability of labor, raw materials, technical skills, direct or indirect subsidies, and capital that can be tapped locally at a cost advantage. For example, many U.S. firms that deal in labor intensive products have cited China's low labor cost as a significant impetus for locating facilities there (Fuhrman and Suhuman, 1994). A firm may internationalize abroad to assure itself reliable low cost supplies of raw materials (Teece, 1981). The origins of multinational firms have been traced to sourcing of raw materials, e.g., oil and copper multinationals (Vernon, 1971).

The notion of factor advantage, proposed by Ricardo as early as 1817, can be modified into a more general notion of National Technical Capabilities, or NTCs (Lall, 1992), which pertain to the ease with which business operations can be conducted effectively and efficiently within a country. Countries with high

NTCs offer unique competitive advantages to firms operating in that country by forcing them to be "world class" competitors. The U.S. is an ideal example of a country with high NTCs for many industries. Overseas firms operating in the U.S. enjoy the benefit of assimilating the competitive business culture and technical expertise in industries where U.S. firms hold a globally competitive position.

Learning. Another benefit of internationalization is the ability of a firm to "learn" from one market and apply it to other markets (Ghoshal, 1987). Firms like P&G and Xerox have benefitted by learning from overseas markets and applying the ideas from various countries (including Japan) to their products and processes in home and other markets to gain competitive advantage. This practice of learning from other countries can take place indirectly by means of strategic investments (shadow options) in firms developing new technology (Hurry, Miller, and Bowman, 1992). This type of learning and general understanding of trends that are evolving throughout the world preempts competition from both overseas and domestic rivals as competitive advantages are denied to other firms.

Flexibility. Researchers, including Kogut (1985a, 1985b) have proposed that firms with international operations benefit from the flexibility of their value activities. Value activities refer to the various physical and technologically distinct activities carried out by the firm (Porter, 1980). For example, a firm operating in many countries will be able to move its production activity to a

country which offers maximum advantage in relevant factor conditions and currency fluctuations. This type of flexibility in operations can be maximized using "intra-firm" transfer as a facilitating mechanism (OECD, 1993).

Portfolio Diversification. Firms that internationalize also diversify their market base. Diversification of a firm's operations over a variety of nations may help reduce the total business risk for a firm, as it allows risk pooling of a firm's operations, thereby reducing the variance in return or profits (Shaked, 1986). The argument is supported by researchers using portfolio theory from the field of finance. Researchers claim that the reduced variance in risk and returns of multinational firms are due to the poor correlation among economic conditions across nations (Caves, 1982).

Overcoming Trade Barriers. Foreign investment by firms is also used for overcoming trade barriers (e.g., tariffs, quotas) in other countries. Another frequently used type of trade barrier is the non-tariff barrier of voluntary export restraints (VERs). Non-tariff barriers can be created by governments through simple administrative regulations. For example, the French government's claim of "Japanese invasion" in consumer electronics led to an order declaring that all VCRs entering France had to be shipped through Poitiers, which is located a couple of a hundred miles from the French seaports and has only a small customs office. Similarly, Japanese car exports to the U.S. were also limited by VERs where the Japanese firms agreed to export only a set number of cars per year, due to the threat of U.S. government sanctions. The imposition of quota

Table 2.1: SUMMARY OF FINDINGS OF STUDIES TESTING FOR A RELATIONSHIP BETWEEN MEASURES OF INTERNATIONALIZATION AND PERFORMANCE

STUDIES REPORTING			
Positive Relationship	**No Relationship**	**Negative Relationship**	**Inverted U - Shaped Relationship**
Siddharthan & Lall (1982)	Buckley, Dunning & Pearce (1978)	Chang & Thomas (1989)	Daniels & Bracker (1989)
Grant (1987)	Haar (1989)	Collins (1990)	Geringer, Beamish & daCosta (1989)
Buhner (1987)	Collins (1990)		Sullivan (1994)
Grant, Jammine & Thomas (1988)	Sambharya (1995)		Hitt, Hoskission & Kim (1994)
Kim, Hwang & Burgers (1989)			

and other tariff restrictions on Japanese imports in Europe and the U.S. led Japanese manufactures to establish overseas plants (Grant, 1991).

Some trade barriers, like regulation of foreign trade and investment, are more direct. For example, many Middle Eastern countries require that a firm have a local partner before it can locally establish any kind of operation, thereby forcing firms to operate in these countries. Hence, in some situations, firms may be forced to internationalize to overcome trade barriers.

Researchers support the above normative arguments by citing examples of organizations that have benefitted from these advantages. Currently, it appears that no study has attempted to test, empirically, the existence of the above benefits (with the exception of factor advantages). More importantly, whether these advantages translate into increased firm performance is a question which needs to be addressed by future research.

Researchers, however, have tested to see whether any direct linkages exist between measures of internationalization and performance. The results of these studies are highly inconsistent. For example, four sets of findings have been reported in internationalization-performance literature (see Appendix 1 for a brief summary of these studies). Table 2.1 provides a brief summary of the findings.

Despite numerous studies on internationalization performance linkage, opinion is varied as to the relationship between internationalization and performance. The inconsistent findings could be the result of three major

anomalies present in the above studies, namely: conceptual and logical problems; sample selection; and measures of internationalization used in testing of the internationalization performance relationship. The first two anomalies are discussed below while the third anomaly is discussed in the subsequent section.

Conceptual and Logical Problems. As presented in the conceptual framework in the previous section, the relationship between internationalization and performance need not be direct. A firm's ability to profit from international operations is a function of a number of elements which act both collectively and individually to influence the performance of a firm. For example, the extent to which a firm could profit from a particular international strategy is influenced by: (1) its own resources and its ability to sustain its competitive advantage; (2) the support it receives from the cultural traits, economic and socio-political factors prevailing in the home country when compared with similar resources available to firms from other countries in the context of global industry structure; (3) the relative bargaining power of various host countries; (4) the nature of global industry structure and the firm's relative position in it; (5) the ability of global environmental influences (political, trading, and socio-economic) to constrain or encourage opportunities for a firm to profit in a global environment; and (6) the willingness and ability of various host countries to influence a firm's global strategy so as to improve their share of gains from firm investments. Hence, attempting to test for any direct linkage between internationalization and

performance, ignoring the various other linkages, is conceptually dubious. In view of this conceptual problem, this study will not attempt to test for the linkages between measures of internationalization and performance.

Sample selection. Many studies testing for the relationship between measures of internationalization and performance have drawn sample combining firms from a number of countries (Haar, 1984; Sullivan, 1995). Using of sample of firms from different nations could introduce confounds in studies due to COE (Sethi and Elango, 1995), thereby leading to erroneous findings. Home country attributes that could influence firm performance include: cultural values and institutional norms; economic and physical resources; and governmental policies. These differences create a nation wide managerial preference or "dominant logic" (Prahalad and Bettis, 1986) as to how a firm needs to be operated. Firms within a nation try to conform to these local norms and attitudes towards capital structure, profitability and growth due to institutional and other pressures. Few studies which have tested for home country differences have found that the relationship between internationalization and performance is influenced by the home country of the firm (e.g. Buckley, Dunning and Pearce, 1978). The importance of controlling for country of origin is well illustrated by Geringer, Beamish, and daCosta (1989). When Geringer, et. al. initially tested to see if there was a relationship between internationalization and performance with their sample of 181 firms from U.S. and Europe they found no relationship between

the two. However, after controlling for continent of origin they found internationalization to be related to ROS and ROE with an inverted U type relationship. To avoid this confound, this study's sample is restricted to a sample of firms from a single country.

MEASURES OF INTERNATIONALIZATION

Literature on internationalization indicates a variety of ways internationalization has been measured. Among them are: foreign tax credits of U.S. firms (Wolf, 1975); percentage of foreign sales to total sales (Aggrawal, 1979; Buhner, 1987; Collins, 1990; Grant, 1987; Grant, Jammine and Thomas, 1988; Kim, Hwang and Burgers, 1989; Shaked, 1986); percentage of foreign assets to total assets (Aggrawal, 1979; Daniels and Bracker, 1989); foreign profits (Aggrawal, 1979); sales-weighted geographic diversification across four major continents, i.e., Africa, Asia and Pacific, Europe, North America, and South America (Miller and Pras, 1980; Hitt, Hoskisson and Kim, 1994); growth in international sales (Siddharthan and Lall, 1982); percentage of overseas subsidiaries to total subsidiaries (Errunza and Senbet, 1984; Siddharthan and Lall, 1982) and percentage of foreign affiliate sales to total sales (e.g.. Geringer, Beamish and daCosta, 1989). A great many of these studies use foreign sales ratio as a measure of internationalization (Aggrawal, 1979; Buhner, 1987; Collins, 1990; Grant, 1987; Grant, Jammine and Thomas, 1988; Kim, Hwang and Burgers, 1989; Shaked, 1986). Unfortunately the findings of these studies do

not lead to a definite relationship between measures of internationalization and performance.

It is our contention that internationalization can best be understood as a multi-dimensional construct. Therefore any narrow measure of internationalization is likely to confound the benefits (thereby profitability) of internationalization. The inconsistency in findings (Daniels and Bracker, 1989; Grant, 1987; Grant, Jammine, and Thomas, 1988; Kim, Hwang, and Burgers, 1989; Shaked, 1986; Michel and Shaked, 1986) might be explained due to the use of a single measure.

One multi-dimensional alternative, to operationalize internationalization has been that of Sullivan (1994). He operationalized internationalization as a linear combination of foreign sales/total sales (FS); foreign assets/total assets (FA); overseas subsidiaries/total subsidiaries (OS); top managers' international experience (TE); i.e., cumulative duration of top managers international assignment in the current job; and "psychic"[1] (Ronen and Shenkar, 1985) dispersion of international operations (PI), i.e., dispersion of firms' subsidiaries in the various psychic zones. This scale probably represents the most extensive operationalization of internationalization and was designated the "Degree of Internationalization Scale" (henceforth referred to as the DOI scale) by Sullivan.

---

[1] Ronen and Shenkar (1985), based on a meta-analysis of cross-cultural studies, decomposed the world into ten psychological zones - Anglo, Germanic, Nordic, Near Eastern, Arab, Far Eastern, Latin American, Latin European, Independent and Other. For example, if company A in Sullivan's sample operated subsidiaries in Belgium (Latin European zone) and Bermuda (Other zone) then the firm will be assigned a score of 20% for internationalization.

Despite the claim of DOI being a meaningful measure of internationalization (Sullivan, 1994; pg. 336) based on desirable psychometric characteristics, the scale has a number of deficiencies. Three of its components (OS, TE, PE) have serious logical flaws in operationalization.

(1) Usage of the ratio of number of overseas subsidiaries/total subsidiaries as a measure of a component of internationalization may not be valid, because firm's subsidiaries vary in size and importance, and firms register subsidiaries in various countries for political, legal, and tax purposes rather than economic purpose alone. Hence, equally weighting all subsidiaries could lead to erroneous conclusions.

(2) The use of attitudinal measures in operationalizing internationalization. For example, use of top managers' international experience based on a company-reported career history as a component of internationalization is questionable as a top managers' international experience in a single firm may not always be related to the extent of internationalization operations of that particular firm. This flaw in operationalization can be illustrated with the following statement: "...firm A's managers have an average 15 years' overseas experience in their current jobs and hence Firm A is more internationalized than firm B whose managers have only 10 years' average overseas experience in their current job." Only if the above

statement is always true may one accept Sullivan's operationalization. This is not the case since the statement is loaded with assumptions. A manager's international experience may or may not be related to extent of internationalization by the firm.

(3) Finally, as discussed earlier, usage of subsidiaries to measure the psychic dispersion of international operations. First, subsidiaries vary in sizes and importance, and their geographic location based on psychic characteristics may not always be related to internationalization. For example, former "East Block" countries embracing capitalism, or China opening its border for foreign investment reflect changes in "psychic" zones or orientation (i.e. Anglo, Germanic, Far Eastern, Near Eastern, Latin European and Latin American). Hence, one needs to ask, "Does the firm's extent of internationalization change with change in "psychic" orientation of regions?." This is certainly not the case. Based on this reasoning, one should reject the DOI as a measure of internationalization.

Moreover, it is inconceivable to suggest a theoretical linkage between psychic measures and objective measures of internationalization. Given the limitation of existing operationalizations of internationalization this study will use a composite measure of internationalization to overcome the problem of single measures. In this study we have used operationalized internationalization of objectively

measurable components to overcome apparent shortcomings in the literature in this regard. Internationalization is operationalized as the composite average of three objectively measurable variables, i.e., foreign sales ratio, foreign assets ratio and foreign profits ratio.

Chapter 3

Development of Hypotheses

This chapter reviews various theories of the multinational firm. Theoretical linkages are developed based on the Structure-Conduct-Performance (S-C-P) paradigm and resource-based view of the firm. Hypotheses are developed linking industry and firm drivers to a firm's rate of internationalization.

Overview

A number of theories or explanations have been offered to explain why a firm internationalizes. These theories or explanations are drawn from a variety of disciplines (i.e., international business, strategic management, finance and economics); hence, the focus of these theories varies. For example, the theory of comparative advantage from macro-economics primarily focuses on differences in productivity (i.e. comparative advantage) across regions/nations, whereas the theory of internationalization proposed by Aharoni (1966) focuses on behavioral factors influencing internationalization. Even though all these theories offer some degree of explanation as to why firms internationalize, and hence hold relevance, the goal of this study is to understand the drivers inducing the change in the rate of internationalization of firms. This chapter begins with a

review of the various theories of the multinational firm which will serve as the theoretical basis for this dissertation. Based on the logic of the conceptual framework developed in the previous chapter, hypotheses linking the variables of the current study are stated.

THEORIES OF THE MULTINATIONAL FIRM

"Market power" and "transaction cost" explanations have been used to rationalize the decision by a firm to operate internationally (Hymer, 1976; Horaguchi and Toyne, 1990). Hymer proposed that firms exist because they possess "unique assets" in terms of products, processes and skills. Examples of unique firm-specific assets and intangible wealth include: established brand names, firm reputation, favored access to suppliers and skilled manpower; and superior products and processes. The poor imitability of these unique assets enables a firm to gain "competitive advantage" or "market power" over its rivals (Porter, 1980; 1985). Firms can exploit firm specific knowledge and intangible wealth to a larger degree by operating in domestic and international markets than in a domestic market alone (Caves, 1971). These resources, when employed in a host country, serve to reduce rivalry as they are imperfectly imitable (Kindleberger, 1969). Multinational firms can be viewed as a special case of the multi-plant firm operating in different countries due to market imperfections (Horaguchi and Toyne, 1990). In brief, MNCs can be understood as firms which integrate industries by owning assets or controlling activities

across countries as a result of structural market imperfections and transaction cost advantages (Hymer, 1970; Teece, 1981).

Firms that wish to maximize sales (or profits) through overseas operations may want to sell, contract, or license their assets to firms in other countries rather than operate in an overseas market directly. However, the market for firm-specific tangible and intangible assets is imperfect, resulting in high transaction costs (Williamson, 1975). The source of high transaction costs is the uncertainty involved in the nature of the demand for the product or service in a new environment. Firm-specific assets, like firm-specific knowledge which is tacit in nature, are also hard to transfer across firms or nations (Winter, 1987). These circumstances can force a firm to internalize transactions by moving overseas. By internalizing foreign activities a firm can avoid the disadvantages inherent in market transactions and can capitalize on its assets (Dunning, 1980). This analysis, which is based on the work of Coase (1937), has been referred to as the theory of internalization (Rugman, 1980). Conceptual and empirical support for these views have been provided by Buckley and Casson (1985), Hennart (1986), and Lall (1980). Some authors of this view of MNCs (i.e., theory of internalization) suggest that the MNC is a special case of the general theory of the firm (e.g., Buckley, 1985). It should be noted that there is considerable debate as to the origin of the notion of "internalization advantage" (Dunning, 1988; Horaguchi and Toyne, 1990; Rugman, 1986).

Even though one would credit Hymer for being a pioneer in MNC theory

and stating the importance of firm specific assets for MNCs, it should be noted that Hymer's view of MNCs is quite narrow. MNCs exist for several other reasons than to exploit firm-specific resources. Some of these reasons include: sourcing of raw materials; financial investment; production and distribution of functionally related products (referred to as lateral integration); competition; and technology. One could say that MNCs exist for vertical, horizontal, lateral, conglomerate, or strategic reasons (Teece, 1981). The reasons might vary from a simple search for raw materials to strategic reasons like tapping other countries' technological resources.

Firms operating across borders will also have to face differences in factor costs, as well as other country-based differences. Country-based economic, political (Boddewyn and Brewer, 1994), social and demographic differences play a significant role in influencing multinational profitability based on individual "country attractiveness" (Caves, 1982; Root, 1987). Dunning (1981, 1988) attempts to close this gap in MNC theory by means of a framework known as the **Eclectic Paradigm**. This paradigm suggests that a firm's tendency to own foreign investments is a function of three factors (i.e., ownership, locational, internalization advantages - henceforth referred to as OLI advantages). Briefly stated, this paradigm says that ownership advantages refer to the extent and nature of firm-specific advantages held by the firm; locational advantages refer to the extent and nature of location bound endowments and markets offered by various countries; and internalization advantages refer to the extent to which

these advantages are best internalized by the firm.

Later, Dunning (1993) developed an extended version of the eclectic paradigm in order to explain firm specific variances in utilizing OLI advantages. He proposed a fourth group of variables as "dynamic add-ons" based on the notion of "global strategy" (e.g., Ghoshal, 1987). He explained that these dynamic add-on variables are a function of firm specific characteristics which lead to differences across firms in internationalization strategies. Note that Dunning's list of dynamic add-ons is a list of variables about two pages in length (pg. 99-101). This anecdote illustrates the complexity involved.

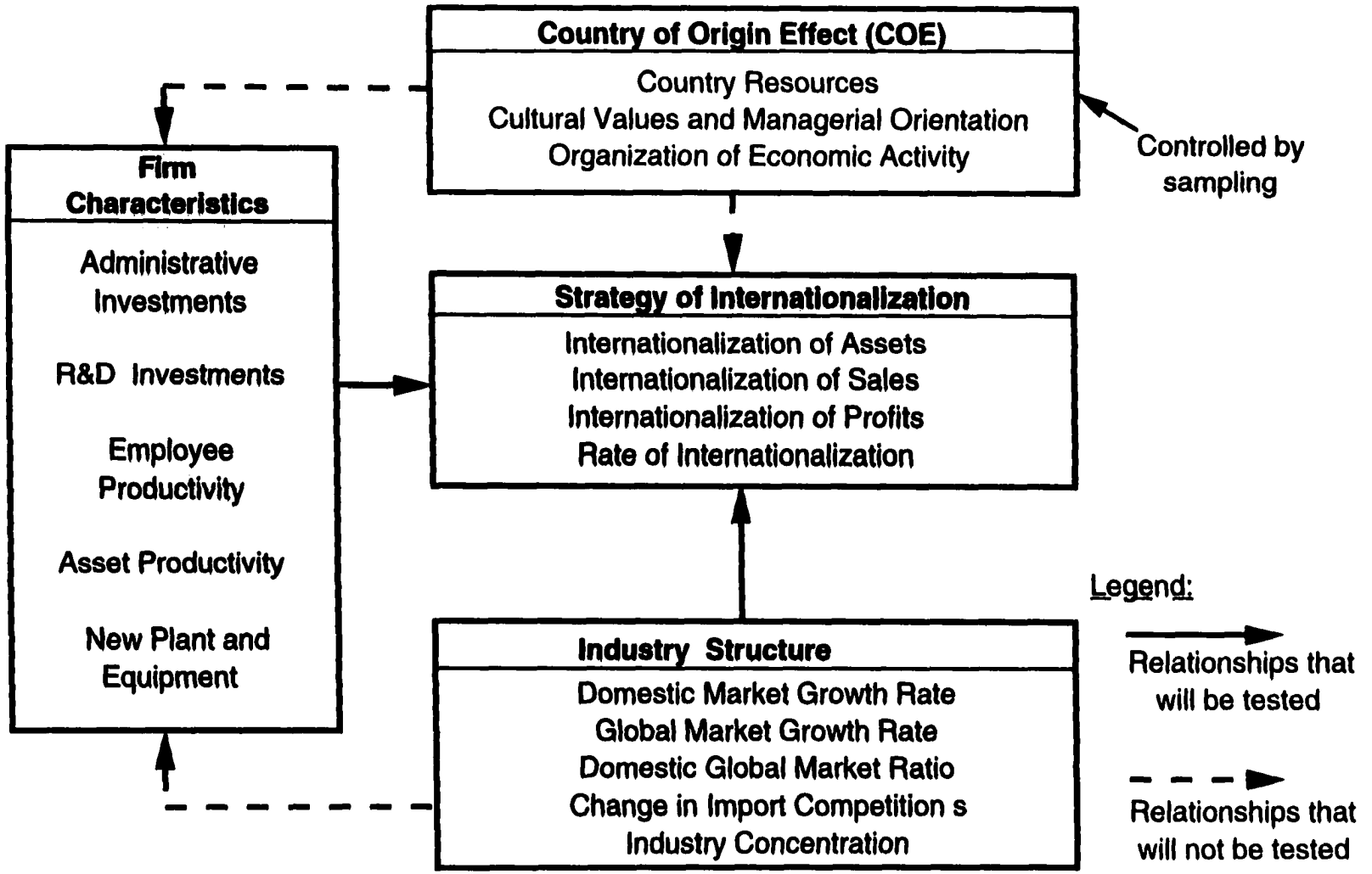
Dunning's framework appears to be the most comprehensive model of MNC internationalization. However, its comprehensive nature and the inclusion of a long list of variables makes it nearly impossible to fully test the concept. Moreover, notwithstanding its comprehensiveness, the framework fails to capture the full extent and implications of internationalization by firms (e.g., oligopolistic rivalry, etc.). Other researchers have also illustrated that use of internalization advantages and ownership advantages separately would be "double counting" (Buckley, 1988) or "redundancy" (Itaki, 1991), as there would be no internalization advantages if there were no ownership advantages.

Synthesis. It should now be apparent there is no single definitive "Theory of the Multinational Firm." However, sufficient theoretical bases exit to suggest the following:

> *Multinational firms differ from other firms, as they operate across national boundaries integrating industries across countries (Buckley, 1985; Hymer, 1970). Therefore, multinational firms may be said to represent a special case of the general theory of a firm (Coase, 1937).*
>
> *A firm's internationalization strategy is likely to be influenced by three factors (Buckley and Casson, 1985; Dunning, 1981; 1988; 1993; Hennart, 1986; Hymer, 1970; Kindleberger, 1969; Rugman, 1980; 1986; Teece, 1981). They are:*
>
> * *Firm specific differences (or lack thereof).*
> * *Industry/market/competitive conditions.*
> * *Home and host country differences.*

The goal of this dissertation is to test for linkages in industry structure, corporate characteristics and rate of internationalization of firms. Hence, the current study confines to two of the above factors. The third factor (home and host country differences) is too large in scope, complexity and implication to be included in a single study. However, home and host country differences do influence strategy formulation and implementation (Day, Yip, and Christmann, 1995). To insulate this study from possible confounds of Country of Origin Effect that can be introduced by not including COE variables, the study sample will be restricted to U.S. firms. The research model that will be used to develop hypotheses is illustrated in the Figure 3.1.

Figure 3.1: Research Model



DEVELOPMENT OF HYPOTHESES

Influence of Industry Drivers on the Rate of Internationalization

In general, industry drivers refer to various external forces acting within the context of the firm's environment thereby influencing firm strategy and its outcomes. Industry drivers refer to industry forces that impact -- both positively and negatively -- a firm's extent of internationalization. Several studies in industrial organization and strategy management literature have found consistent support for the linkages between industry and firm strategy which is based on the Structure-Conduct-Performance paradigm, or S-C-P paradigm. S-C-P Paradigm is dominant in industrial organization literature (see Schmalensee, 1989, for a review). Briefly, this paradigm consists of three elements (i.e. industry structure, conduct or strategy, and performance). Porter (1981), explains the S-C-P paradigm and its elements in the following manner:

> "Industry structure determined the behavior or conduct of firms, whose joint conduct then determined the collective performance of the firms in the marketplace...*Performance* was defined broadly and in the economist's sense of social performance, encompassing dimensions such as allocative efficiency (profitability), technical efficiency (cost minimization), and innovativeness. *Conduct* was the firm's choice of key decision variables such as price, advertising, capacity, and quality. Thus, in policy terms, conduct can be viewed as the economic dimensions of firm strategy. Finally, *industry structure* was defined as the relatively

> stable economic and technical dimensions of an industry that provided the context in which competition occurred... A final crucial aspect of the ... paradigm was the view that because structure determined conduct (strategy), which in turn determined performance, we could ignore conduct and look directly at industry structure in trying to explain performance..." (pg. 611).

The existence of feedback effects between the various S-C-P elements, though not explicitly stated in the S-C-P paradigm, has been acknowledged by researchers (Jacquemin, 1986; Scherer, 1980). For instance, according to Porter (1979), "the determinant of companies[sic] profits rests on the structure within industries as well as the industrywide traits of market structure".

Industry drivers influence a firm's rate of internationalization in a number of ways. First, the degree to which an industry is profitable, the extent of international competition that takes place in an industry, and the extent of scale or scope economies present in an industry may change a firm's motivation to operate internationally. Firms with international operations emanating from large domestic markets invariably have large domestic operations as well. Domestic market structure and competitive conditions in the home market encourage particular types of strategic behavior in firms. For example, in highly concentrated industries firms will have less of a motivation to internationalize as they may be satisfied with their current oligopolistic profits in situations where scale economies can be achieved through local operations. On the other hand,

industries with low concentration may encourage firms to diversify into international markets where competition could be less intense in order to maximize profits. Some scholars have referred to the above phenomena as "defensive diversification" (Bass, Cattin and Wittink, 1977; 1978).

Second, every firm's behavior is affected by the type of competitive rivalry in its industry (Porter, 1985). For example, industries characterized by intensity in advertising or research and development would facilitate/force firms to develop relevant strategies, capabilities and skills in the above factors well above international standards. These resources developed by a firm in its domestic industry increase the chances of the firm's success abroad while creating entry barriers in home markets.

Studies also show that entry by foreign rivals in the domestic market usually leads to increased rivalry in domestic markets (Caves and Porter, 1978; Esposito and Esposito, 1971; Melo and Urata, 1986; Oster, 1994; Pagoulatos and Sorenson, 1976; Pugel, 1978; Turner, 1980). The influx of foreign rivals into one's domestic markets not only increases the intensity of competition but also induces the domestic firm to internationalize its operations to diversify its markets. By internationalizing operations, a domestic firm can also internalize some of the advantages of foreign competitor firms (Watson, 1982).

This pattern of behavior may also be due to the "oligopolistic reaction" tendency of MNCs (Knickerbocker, 1973). Oligopolistic reaction refers to firms in oligopolistic industries diversifying overseas to countermove competitive actions

of other domestic firms. Foreign direct investment by one firm could trigger a similar investment by other leading firms in the industry to maintain competitive stability and deny competitive advantage to rivals (Knickerbocker, 1973). This could force remaining firms in an industry to "mimic" (imitate) each other due to the pressures of institutional environment (Powell and Dimaggio, 1991). Graham through his "exchange of threat" hypothesis (1978; 1990) explains how this may happen when a firm from one country enters another firm's home country. He postulates that companies may operate in one another's home countries to be able to retaliate if one seeks to expand in the other's home market. Such behavior for protecting market share can be found in many industries, e.g., Fuji and Kodak in photo films and Goodyear and Michelin in automotive tires (Hamel and Prahalad, 1985). Hence, a firm's rate of internationalization could be driven by industry factors. The following section will develop hypotheses linking industry drivers to the rate of internationalization by firms.

Global Market Growth Rate. The rate of growth of international markets could be a significant factor in influencing the extent of internationalization by a firm. International markets may continue to grow, even when the domestic market is mature, due to the slower process of diffusion of product and process overseas (Vernon, 1966). Firms with international operations that are located in stagnant or low growth markets at home may have to fight hard for market share of domestic customers who provide only marginal revenues. Such firms will be

able to exploit their operations more effectively and economically in the international marketplace than by operating in domestic markets alone.

Firms located in industries that are growing globally also internationalize to prevent new strong rivals from arising, or to keep their current competitors from getting too large by locating in growing markets with large demand potential. Firms attempt to locate themselves in growing markets like China and India to cash in on the expected growth and to prevent rivals from getting too strong, despite poor profit potential in the near term. For example, many large U.S., U.K., and German chemical companies have invested heavily in Asia so that they will continue to maintain their relative global market share and competitive positions if Asia becomes the largest consumer of chemicals (Jeannet and Hennessey, 1995; Studer, 1994). Based on the above discussion, it is proposed that:

Hypothesis 1: *Other things remaining equal, a firm's growth in internationalization will be positively related to the global market growth rate of the industry in which the firm is located.*

Domestic Market Growth Rate. The growth of markets in which the firm operates usually sets a "cap" on firm growth and profitability. For example, a firm operating in a growing market will be able to grow and make profits much more easily than a firm in a mature or declining market. The lack of growth and the tapering off of market demand usually sets firms in a fierce battle for market share which results in a lower profit margin for all players (Oster, 1994). This

fight for market share usually leads to the elimination of "weak" players, resulting in an oligopolistic industry structure. Such oligopolistic industries are generally characterized by few firms with large but stable market shares, and mutual recognition by firms that ones' gains in market share is usually at the expense of the other (Burgess, 1989).

In such circumstances, diversification of a firm's product markets allows the firm to overcome the lack of growth in current product markets by diversifying into growing markets. The high market share held by firms in their current industries after elimination of their weak rivals would help them to subsidize their diversification into other industries. Based on the above discussion, it is proposed that:

Hypothesis 2: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the domestic market growth rate of the industry in which the firm is located.*

Domestic/Global Market Ratio. Domestic/Global market ratio is operationalized as the total domestic market sales divided by total global sales for a particular industry. The size of the domestic market relative to global markets can influence a firm's prospects and potential to grow (Shapiro and Taylor, 1990) thereby influencing a firm's motivation to operate abroad. The size of local market can influence a firm's prospects and potential (Shapiro and Taylor, 1990) thereby influencing a firm's motivation to operate abroad. Firms located in small markets are forced to operate abroad to achieve minimal

economies of scale (this may not be the case in fragmented industries and/or closed market economies). The degree of importance to a firm of operating abroad will depend on the extent of demand for its products in its home country and the extent of scope/scale economies present in an industry. For example, a U.S. based firm has a market representing approximately 25% of the worlds' purchasing power. This gives the U.S. firm considerable freedom in its choice of whether to operate internationally in most industries. A firm based in Switzerland does not have this freedom in most instances and may have to operate at least in the Germanic region to achieve minimal economies of scale. Based on the above discussion, it is proposed that:

Hypothesis 3: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the growth in the ratio of domestic market sales to total global market sales of the industry in which the firm is located.*

Import Competition. Import competition usually leads to increased rivalry in an industry. This may take place for many reasons. First, firms from foreign countries differ in motivations, goals, etc. Many foreign firms export their products to other nations in order to gain market share or earn foreign exchange even with little or no profit. For example, many Japanese firms are believed to be motivated to market share gains rather than immediate profits (Doyle, Saunders and Wong, 1986). Second, foreign firms have different factor advantages (e.g., low cost labor, governmental subsidies, protected domestic market) which allow them to compete on the basis of low price or through

differentiation. In such circumstances domestic firms are forced to reduce prices or increase product value, usually leading to lower profits. Third, the entry of foreign competition, brings to the market new capacity and a desire to gain market share results in price wars among firms. In some circumstances incumbent firms may face increased operating costs because of reduced sales volumes (Porter, 1980).

Import competition may also be targeted at a labor intensive segment of the industry. Many case studies of successful market penetration by foreign firms show the initial market entry by foreign firms takes place at the price sensitive segments of an industry. This is more likely to happen when the foreign firm is from a relatively low-wage country entering a relatively high-wage country. One reason for this view is that "a competitor may start with a comparative-advantage-related edge that provides a basis for penetrating foreign markets" (Porter, 1986: p.38).

Import competition may also force domestic firms to internationalize so that they can diversify their base market and deny competitive advantages to their overseas rivals (Watson, 1982). Case studies in the past of successful competitive retaliations (e.g., Goodyear, Kodak) show that only when the domestic firm has international operations, preferably in the home nation of the rival, does the domestic firm succeed in competitive battles. For example, when Fuji attempted to gain market share in the U.S. market by price cuts in photo films, Kodak did the same in Japan, thereby forcing Fuji to withdraw its price cut

(Hill and Jones, 1992). In industries characterized by import competition, firms that fail to internationalize may not receive all the benefits (e.g., learning, scope, scale, cross border subsidization) which might accrue to their competitors. Based on the above discussion, it is proposed that:

Hypothesis 4: *Other things remaining equal, a firm's growth in internationalization will be positively related to the growth of import competition in the industry in which the firm is located.*

Concentration. Concentration is viewed to be the most important element of market structure. Concentration refers to size distribution of firms that operate in an industry (Curry and George, 1983). Highly concentrated industries lead to increased industry profitability (Attaran and Saghafi, 1988; Bain, 1951; Miller, 1969; Also see Weiss, 1974 for a review of 42 studies). How this happens may be explained in the following manner. Concentrated industries (by definition) are characterized by few dominant firms. These firms do not indulge in intense price competition because any market share gain achieved by one firm is usually at the expense of another. Hence any competitive move by one firm usually results in retaliation by the other firm, and so on, thereby resulting in decreased profit margins for all firms. Firms in such industries are better off not indulging in intense price competition. It is felt that these firms usually resort to cooperative pricing strategies (rather than undercutting each other) leading to higher profits.

Such a situation of high industry profitability is bound to attract new entrants to the industry. New entrants however face high entry barriers in

concentrated industries as incumbent firms are typically large dominant firms with "market power". These incumbent firms usually use their "market power" (e.g., blocking of marketing channels, etc.) to prevent any new entrants from gaining a foothold in the industry. Firms in such industries earn high profits as these industries are characterized by less price competition. Firms with high market power may not be motivated to operate in overseas markets as they are better off focusing on the domestic market and maximizing their profitability. Market power is defined here as, the market share held by the firm relative to the average sized firm in the industry. The extent of market power held by a firm in its home country market, both in absolute and relative terms, influences the rate of a firm's internationalization. Current empirical evidence also supports the above notion that firms in concentrated industries are less inclined to internationalize (Nolle, 1991). Based on the above discussion, it may be proposed that:

Hypothesis 5: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the extent of concentration in the industry in which the firm is located.*

Influence of Firm Drivers on the Rate of Internationalization

This section will briefly explain the rationale of the influence of firm drivers on the rate of internationalization by a firm based on the theoretical foundations of the "resource-based view of the firm" (Wernerfelt, 1984). Firm drivers refer to forces operating within the firm, that impact -- both positively and negatively -- a

firm's extent of internationalization. The resource-based view of strategy has a close affinity to views on "distinctive competencies" illustrated in earlier textbooks of strategy (see Andrews, 1971; Ansoff, 1965). This view of strategy argues that competitive advantage is gained by firms through valuable resources, or unique firm-specific differences possessed by the firm. In general, resources refer to all tangible or intangible assets which are tied to the firm semi-permanently (Wernerfelt, 1984; pg. 172). The origins of this view of strategy can be traced to Penrose (1959) who points to the fact that a firm is a collection of physical, human and intangible assets which are deployed by administrative decisions (pg. 24).

This view of strategy also assumes that managers are interested in the profitable expansion of their firms so that their own personal prestige, ambition, salary, abilities and satisfaction are bettered (Penrose, 1959). This leads managers to exploit all available firm resources in making the firm grow, as a larger firm will result in greater managerial well-being (in terms of power, prestige, and monetary rewards). Support for this notion of managers maximizing their welfare by increasing the size of the firm (irrespective of profitability), is available from the empirical findings of agency theory (for a review, see Eisenhardt, 1989) and diversification literature (for a review, see Ramanujam and Varadarajan, 1989). This would lead one to conclude that a firm's strategic choices towards international growth could be influenced by individual firm differences.

One of the important contributions of the resource-based school is that it helps us recognize that these firm-level differences limit and direct the choice of markets a firm may enter (Penrose, 1959). As illustrated by Penrose (1959), "...in a very significant sense unused productive services are a selective force in determining the direction of expansion..." (pg. 87). Hence, excess supply (or shortage) of resources influence the firm's strategy. For example, a firm with unused productive capacity will have a greater drive towards operating in new international markets where the firm can sell its products and better use its resources. Similarly, a firm with excess (liquid) financial assets may want to diversify and re-deploy its resources in other international markets by buying or investing in new assets.

Studies on the resource-based view (at the corporate level studies) have tested for the linkages between corporate resources, diversification strategy and performance (e.g., Chatterjee, 1990; Chatterjee and Wernerfelt, 1991; Lecraw, 1984; Lemelin, 1982; MacDonald, 1985; Montgomery and Hariharan, 1991). Most of these studies generally support the conclusion that firm resources influence the directionality of diversification and its subsequent profitability. Studies dealing with corporate level strategies operationalize firm resources using information from a firm's balance sheet and other secondary public sources. As this study deals with corporate strategy issues, firm resources will be operationalized using the above studies as a guide. The following section will develop hypotheses linking various firm drivers to the rate of internationalization

of firms.

Resources in Administration and R&D. Firms investing in R&D and administration have a large proportion of their investments committed to their products and processes. These investments create a need for a firm to recoup its investment. One approach to recouping its investment is to increase the sales of its products and services. However, increases in sales will be constrained by the size of the domestic market in which the firm operates. When faced with such constraints, firms are likely to internationalize to spread costs by increasing revenues. Hence, firms with resources in R&D and administration are more likely to be operating in international markets (Helleiner and Lavergne, 1979) to spread costs. Second, firms which possess unique, intangible resources (brand name or product/process skills) have a competitive advantage in the marketplace, as it takes time for rivals to replicate unique resources. For example, Caves (1980) reports that the propensity to engage in overseas operation by "firms skilled in the promotion of branded goods" tends to be higher "than by distributor firms whose domestic strategies had emphasized ... undifferentiated goods" (Caves, 1980: pg. 69). Based on the above discussion, it is proposed that:

Hypothesis 6: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of administrative investments made by the firm.*

Hypothesis 7: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of R&D investments made by the firm.*

Operational Efficiency. Operational efficiency refers to the degree to which a company is successful in extracting profits, productivity, or sales given its asset mix. Operational efficiency of a firm could be measured in two ways: productivity of workers, and productivity of assets. These two measures would indicate a firms ability to use assets/employees to generate sales revenue relative to other firms in an industry. Firms which are efficient are likely to be successful in the market place, compared to firms which are less efficient, due to the comparative advantage in operations. In a similar vein, efficient firms are more likely to internationalize their operations much more quickly than firms with lesser efficiency. Based on the above discussion, it is proposed that:

Hypothesis 8: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of productivity of employees.*

Hypothesis 9: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of productivity of assets.*

New Plant and Equipment. The importance of a firms manufacturing facilities to achieve success in market place has been well reported in literature (Skinner, 1983). Manufacturing facilities allow a firm to develop capabilities to respond in the marketplace with product flexibility, efficiency and quality. One of

the manufacturing variables studied in the past at the corporate level is new plant and equipment. Previous studies in the brewery industry (Hatten and Schendel, 1977; Hatten, Schendel, and Cooper, 1978) and steel industry have found the extent of new plant and equipment to be a critical variable in a firm strategy. Using a similar argument one may propose that for a firm to succeed in the international market it needs to maintain updated plant and equipment to produce goods which satisfy international product standards. Based on the above discussion, it is proposed that:

Hypothesis 10: Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of new plant and equipment held by the firm.

Chapter 4

Research Design

This chapter gives a description of the process of sample selection for this study. Later, the sources of data of this sample and measures that were used are stated. Statistical analysis and the methodology that will be used for data analysis is explained. Descriptive statistics of the study's sample are provided.

Overview

The sample for this study consists of 158 U.S. based firms drawn from seven industries with at least $500 million in annual sales during the year 1991. A table with each of the industries included in the sample and number of firms is provided (see table 4.1). The principle data sources for study will be the U.S. Department of Commerce, Bureau of Economic Analysis publications, COMPUSTAT and WORLDSCOPE databases.

LOGIC AND PROCESS OF DATA COLLECTION

The decision on data collection for this study involved three questions: I) how will the sample be selected for this study; ii) what industries will be selected for this study; and iii) what will be the sources of data for this study. The following four paragraphs will explain how the above decisions were made and conclude with the process of data collection.

Sample Selection: Firms with an annual sales of at least $500 million were chosen as the population sample for this study. This was done for the following reasons: First, the nature of the question decided the issue. Testing the hypotheses required a sample of manufacturing organizations that are likely to have a large variation in the extent and form of internationalization. Second, easy availability and verifiability of the data collected for this study. Finally, using large-sized firms will permit the study to draw valid conclusions and inferences as the empirical findings can be compared with the large amount of information and research that exists on these firms. This practice is also consistent with past research in strategic management.

Industry Selection: Initially, various industries were pre-selected to fit the "broad categorical type" of industries commonly referred to in the literature and business press (e.g., high technology industry, consumer goods industry, emerging industry, mature industry). Later, all the firms with an annual sales over $500 million, for which data were available within each of the preselected industries were included in the sample. This was done to ensure a wide

variation in the type of industries used in the sample. The industries included in the study contribute significantly to the U.S. Gross National Product (GNP) and hold relevance for the future of manufacturing in this country.

Data Sources: The information on industry structure variables are obtained mainly from U.S. Department of Commerce (e.g., Census of Manufacturers) and Bureau of Economic Analysis publications. Information on firm characteristics will be obtained from the COMPUSTAT and WORLDSCOPE databases. These data sources have been widely used in academic research and the reliability of these sources is considered very high. These data reported by the sources is usually gathered either through federally mandated reports like the 10K, or through operating reports filed by companies to various state departments. Finally, it was felt that these data sources will allow the completion of the study in a timely and economical manner.

Process: Initially, we started with a sample of U.S. firms for which data was available on international operations (foreign sales, foreign profits, foreign assets) in the WORLDSCOPE database for the period 1991-1982. This resulted in a sample of 453 firms. Later, information on the firm level dependant variables was collected from COMPUSTAT database. This resulted in the reduction of the sample by 64 firms. It was anticipated that certain firms will be eliminated from the sample due to mergers and acquisitions that may have taken place in the corresponding 10 year period. The remaining sample of 389 firms was later

allocated to various two digit SIC[2] industries based on their primary industry of operation. The sample of 389 firms, however, represented a variety of industries. To avoid confounds which may be created due to over aggregation of data, it was decided to eliminate firms that did not fit the preselected industries for this study. This resulted in a further reduction of the sample by 159 firms, resulting in a final sample of 230 firms. This sample was further reduced to 158 firms by listwise elimination in setwise regression due to missing values. A table indicating the distribution of the firms across various industries is provided (see Table 4.1).

Table 4.1. Table showing sample distribution of firms across two digit SIC industries

No.	Industry	Two Digit SIC Code	Number of Firms	% of Sample
1.	Food	20	11	7
2.	Chemical	28	35	22
3.	Metal Products	34	11	7
4.	Industrial Equipment	35	44	28
5.	Electronic/Electrical Equipment	36	23	14.5
6.	Transportation Equipment	37	14	9
7.	Instruments	38	20	12.5
			158	100

[2] Office of Management and Budget. 1987. Standard industrial classification manual. Springfield, Virginia: National Technical Information Service.

Based on previous research (e.g., Millsap, 1989), it was decided that this study would need a sample with adequate power in the range of .9 to .8 to draw reasonable conclusions. Computations[3] for power calculations indicated that a sample of 150 firms would be required to have power in the range of .9 to .8 for effect sizes ranging from .2 to .07. The final sample size satisfied the minimally required sample of about 150 firms for power considerations (see Appendix 2 and 3 for a listing of firms used in this study along with other descriptive statistics on internationalization). Depending on the industry of the firm, information on the required industry variables was collected. This ensured that the data collected from two sources were matched accordingly .

OPERATIONALIZATION OF VARIABLES

Criterion Variable

Rate of Internationalization: Firms can use one or any combination of the forms of internationalization. For example, a firm can internationalize by exporting its products from its home country(internationalization through sales). A typical example of this strategy would be Cray Computers, which derives a portion of its revenue from overseas sales. Alternatively, a firm can set up subsidiaries in other countries(internationalization through assets). Examples of this form of internationalization include GM and Ford, which have considerable

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[3] All power computations were done using software developed by Borenstein, M. and Cohen, J. (1988). "Statistical Power Analysis: A Computer Program", Lawerence Earlbaum Associates, INC. Hillsdale, N.J. A printout of the results is available from the author.

overseas operations, yet export only a marginal amount of their total production. A third way is to use alliances to internationalize operations. An example of this strategy is Apple Computers, which uses foreign alliance partners for the production and marketing of its goods overseas. Hence, internationalization is operationalized as:

Internationalization = Mean (FTS, FTA, FTP)

FTS = Foreign sales/Total sales
FTA = Foreign assets/Total assets
FTP = Foreign profits/Total profits

Rate of Internationalization =
Internationalization (1991) - internationalization (1982)

The above operationalization of internationalization has three sub-components (i.e., internationalization through sales, internationalization through assets, internationalization through profits). Before we began data analysis, we checked for the reliability of criterion variable (i.e., growth in internationalization). Results indicated a low reliability (alpha=.1039). It was felt that undertaking the study with low reliability may attenuate the relationship between the various drivers and the criterion variable. On careful examination of the various components of the criterion variable it was felt that one of the components of the criterion (foreign profits ratio) was the primary reason for the poor reliability. Therefore, it was decided to drop foreign profits as one of the components of the criterion and rechecked for reliability coefficient alpha. The alpha was found to

be .8425 with just two components (i.e., foreign sales ratio and foreign asset ratio). This was deemed acceptable for this study based on recommendations of Nunnelly (1978, p:245). Hence due to reliability considerations, internationalization was re-operationalized as:

Internationalization = Mean (FTS, FTA)

FTS = Foreign sales/Total sales
FTA = Foreign assets/Total assets

Foreign Profit Ratio. Since foreign profit ratio was dropped as a part of the operationalization of the criterion, it was thought necessary to theoretically comprehend the reasons for the poor showing of foreign profit ratio. We initially looked at the descriptive statistics for the three ratios. Foreign sales ratio had a mean of 11.14 and a standard deviation of 13.51; foreign asset ratio had a mean of 8.15 and a standard deviation of 14.85; and, foreign profit ratio had a mean of 29.16 and a standard deviation of 121.33. The numbers suggest that foreign profit ratio is larger than the other two ratios (foreign sales ratio and foreign asset ratio) combined.

The degree of profitability of international operations in relative terms compared with domestic operations suggests that international operations has a greater overall importance (in terms of profitability) for firms. However, when one looks at the ratio's standard deviation, the variance in international profits is also very large (about 400% over the mean compared to about 100% for the other two ratios). Even though one may speculate that this wide variance could be a main empirical reason for the poor showing of foreign profit ratio in the reliability

analysis, the lingering issue remains -- What is the cause of this large variation?

A review of previous theory and findings suggested three reasons:

I) *Tax minimization (or profit maximization)*: The logic of this argument is based on the traditional theory of investment that assumes that the objective of the firm is to maximize profits by maximizing the difference between cost of capital and returns. Based on this view one may postulate return on foreign investment varies with international differences in tax rates across countries as MNCs will attempt to reduce their net tax burden through tax planning and other mechanisms (Agarwal, 1980).

ii) *Changes in currency exchange rates* may cause large variation in profitability levels irrespective of actual profits made by the firm in overseas markets. For example the Yen/Dollar exchange rate decreased from 226 Yen to the Dollar in the beginning of 1980 to 126.78 Yen to the Dollar in 1992. Thus, a firm that reports profits of its Japanese operations in US Dollars would find a quantum increase in profits even with no real increase in profitability of its Japanese operations.

iii) *Cross-subsidization.* By operating in many countries, firms gain the capacity to cross-subsidize across various markets and thereby gain market share (Hamel and Prahalad, 1985). For instance, a firm operating internationally can practice cross-subsidization by overcharging customers

of one nation, while at the same time, selling products at low prices to customers of another nations. Customers from one nation subsidize customers of another nation to the benefit of the firm. Hence cross-subsidization could also result in wide variation in profitability according to the strategic goal of the firm.

Firms may achieve these three goals by using intra-firm transfers and transfer pricing as a mechanism. Intra-firm trade refers to the "international exchange of goods and services within a multinational enterprise" (OCED, 1993). The OCED report, while commenting on intra-firm trade, stated that:

> "modern production and marketing requires as inputs both tangible and intangible assets, the latter including research and development, technical know-how and marketing expertise. It is quite difficult to transfer these intangible assets from one country to another by means of market transactions, either because "right prices" are simply non-existent for such intangible assets or because contractual arrangements with unrelated parties for the use of firm-specific assets entail high-transaction costs" (pg. 25).

Transfer pricing refers to the price charged by a multinational to its subsidiaries or affiliates for the products and services rendered by it. Two important issues merit explaining. The first one concerns the managerially relevant issue of how the transfer price should be set for transfers of goods and

services within the firm. The second issue (the more critical of the two) is the ability of firms to hide (i.e., transfer) profits. Let us look at a hypothetical example where some firm attempts to subsidize one subsidiary at the expense of another for apparent profit reasons. For example, multinational "XYZ" could sell goods worth $2 million for $200,000 dollars to its subsidiary at country A which may be a relative tax-free haven. This subsidiary in the tax-free haven may later resell the same product to a different subsidiary in country B at a price of 2 million dollars, making a profit of $1,800,000 for serving as an intermediary. So, the multinational firm therefore could avoid payment of large taxes for the sale of goods in the country where the goods originated (i.e., transfer profits from one country to another). Although the example is illustrative and non-specific, and such practices are illegal, many courts have found firms guilty of such practices (based on evidence provided by U.S. government agencies).

It should be noted that many of the above claims are purely speculative as this study did not test any of the above assertions. Testing this concept is problematic because what is available is reported profits. Reported profits may not necessarily be actual profits because an MNC's profits, across subsidiaries, can be hidden by intra-firm pricing, R&D costs, differences in accounting laws across countries, and cross subsidization (Agarwal, 1980). For example, a firm operating in many countries will be able to move its production activity to a country that offers maximum advantage according to changing factor conditions, currency exchange rates, governmental policies, competitor's actions, and adaptation of new technologies (Kogut and Kulatilaka, 1994). The importance of

"intra-firm" transfer as a facilitating mechanism by MNCs (OECD, 1993) is very evident as it accounts for 40% of U.S. trade (Kogut, 1983).

Independent Variables

The independent variables used in this study were operationalized using standard accounting measures. A table indicating the operationalization of various variables is provided (see Table 4.2).

Industry Drivers

1. Domestic Market Growth Rate =
   Percentage change in industry sales over the years 1982-89 in the U.S.

2. Global Market Growth Rate =
   Percentage change in global industry sales over the years 1982-89

3. Change in Domestic-Global Market Ratio =
   Domestic-Global Market Ratio (1989) - Domestic-Global Market Ratio (1982)

   where:

   Domestic-Global Market Ratio =
   Industry sales in U.S./Total global industry sales

4. Change in Import Competition =
Import Competition (1989) - Import Competition (1982)

where:

Import Competition = (Imports+Sales by U.S. affiliates of foreign companies)/ Total industry sales

5. Concentration = Herfindahl-Hirschman index for 50 largest companies

Firm Drivers:
Note: The empirical values for all firm drivers variables represent the average of empirical values during the years 1982-1989.

6. Administrative Investments = Selling and Administrative Expenditure/Sales

7. R&D Investments = R&D Expenditure/Sales

8. Employee Efficiency = Sales/Number of employees

9. Asset Productivity = Sales/Assets

10. New Plant and Equipment =
Plant & Equipment Cost-Depreciation / Plant & Equipment Cost

Time Period. The dependent variable represented the time period 1982-1991, whereas the independent variables represented the time period 1982-1989. Stated differently the independent variables (industry and firm drivers) time period was ahead of the dependant variable (rate of internationalization) time period by two years. This was done based on the causal links claimed in the S-C-P paradigm discussed in Chapter 3.

Table 4.2. Summary of variables used in the study

	Variables	Definition
Industry Drivers	Global Market Growth Rate (GDP)	Percentage change in global industry sales over the years 1982-89
	Domestic Market Growth Rate (GNP)	Percentage change in industry sales over the years 1982-89 in the U.S.
	Change in Domestic Global Market Ratio (DGM)	Change in Domestic-Global Market Ratio (DGM Ratio) = DGM Ratio (1989) - DGM Ratio (1982) where: DGM Ratio = Industry sales in U.S./Total global industry sales
	Change in Import Competition (IMC)	Percentage change in industry imports and foreign direct investment over the years 1982-1989
	Concentration (HHI)	Herfindahl-Hirschman index for 50 largest companies during the year 1987
Firm Drivers	Administrative Investments (SGA)	Selling and Administrative Expenditure/Sales
	R&D Investments (RDS)	R&D Expenditure/Sales
	Employee Efficiency (EMS)	Sales/Number of employees
	Asset Productivity (APR)	Sales/Assets
	New Plant and Equipment (PEN)	Plant & Equipment Cost-Depreciation / Plant & Equipment Cost
Dependant Variable	Foreign Sales Ratio (FTS) Foreign Asset Ratio (FTA) Foreign Profit Ratio (FTP)	Foreign sales/Total sales Foreign assets/Total assets Foreign profits/Total profits
	Internationalization (INT)	Mean (FTS,FTA)
	Growth in Internationaliz-- ation (GINT)	Internationalization (1991) - internationalization (1982)
	Growth in Foreign Sales Ratio (GFTS)	FTS91-FTS82
	Growth in Foreign Asset Ratio (GFTA)	FTA91-FTA82
	Growth in Foreign Profit Ratio (GFTP)	FTP91-FTP82

DATA ANALYSIS

The impact of industry drivers and firm drivers on the rate of internationalization was analyzed using multiple regression analysis (MRC) using the setwise regression procedure (Cohen and Cohen, 1983). We chose setwise regression analysis as it allows us to answer the research question as to the importance of industry drivers vis-a-vis firm drivers. Secondly, we felt that by grouping variables into two sets, i.e., one set with variables within the domain of managerial influence, and other set with variables outside the domain of managerial influence. This will render the study more useful to practical situations.

For the setwise regression analysis, we grouped the independent variables into two sets. A set is generally defined as a group of variables belonging to a "common discourse--a group classified as belonging together for some reason" (Cohen and Cohen, 1983: p133). The various hypotheses were tested using the following regression equations where the independent variables were grouped into industry drivers or firm drivers. According to Cohen and Cohen (1983), "...the use of sets as units of analysis in MRC, proves to be the most powerful for the exploitation of data..." (p. 133). A set of variables for this set is defined as a group of variables belonging to a single driver. Equation I evaluates the impact of industry drivers on the rate of internationalization of firms. Equation II evaluates the impact of firm drivers on the rate of internationalization of firms. Equation III evaluates the relative impact of industry and firm drivers on

Figure 4.1: Industry Drivers - Summary

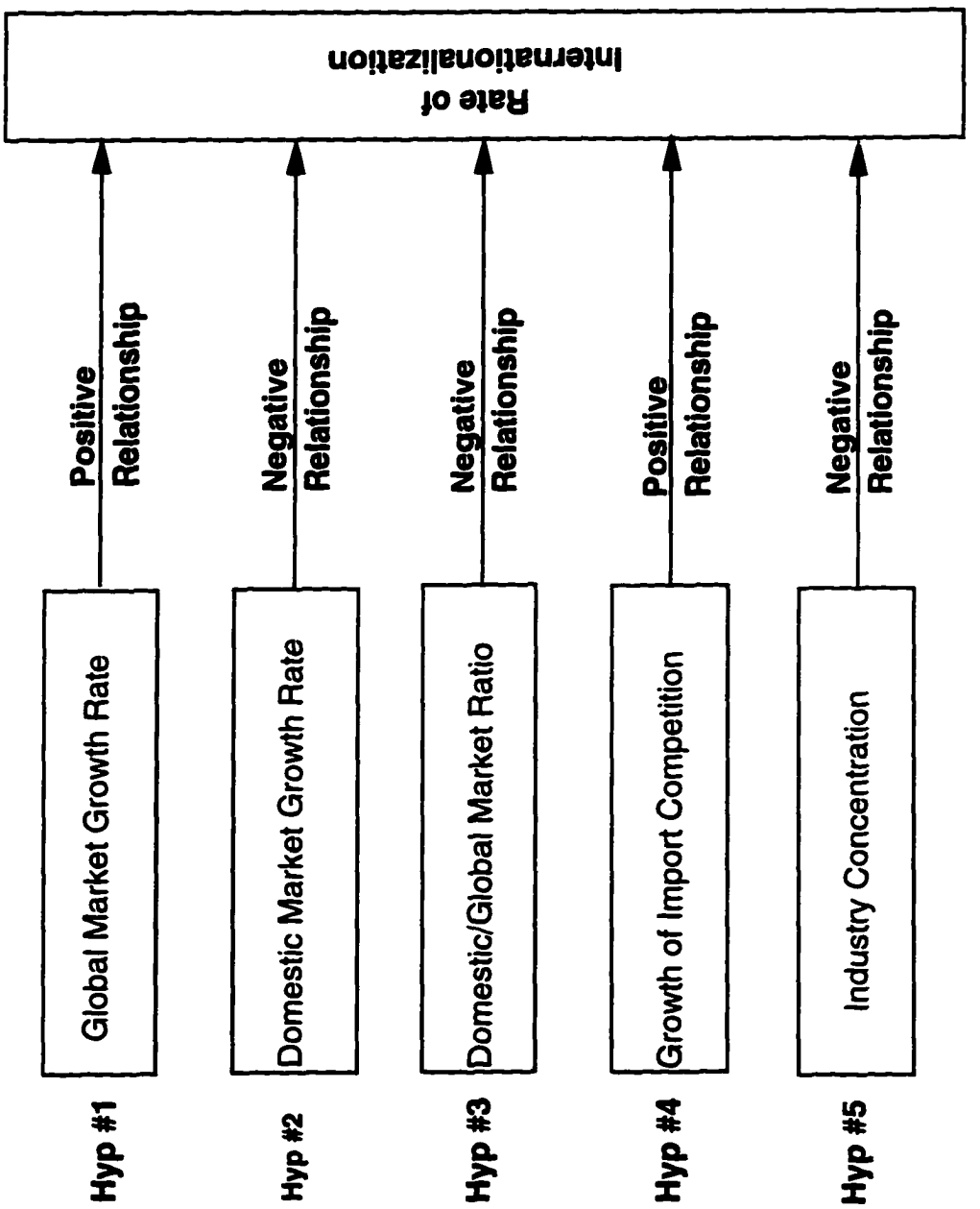
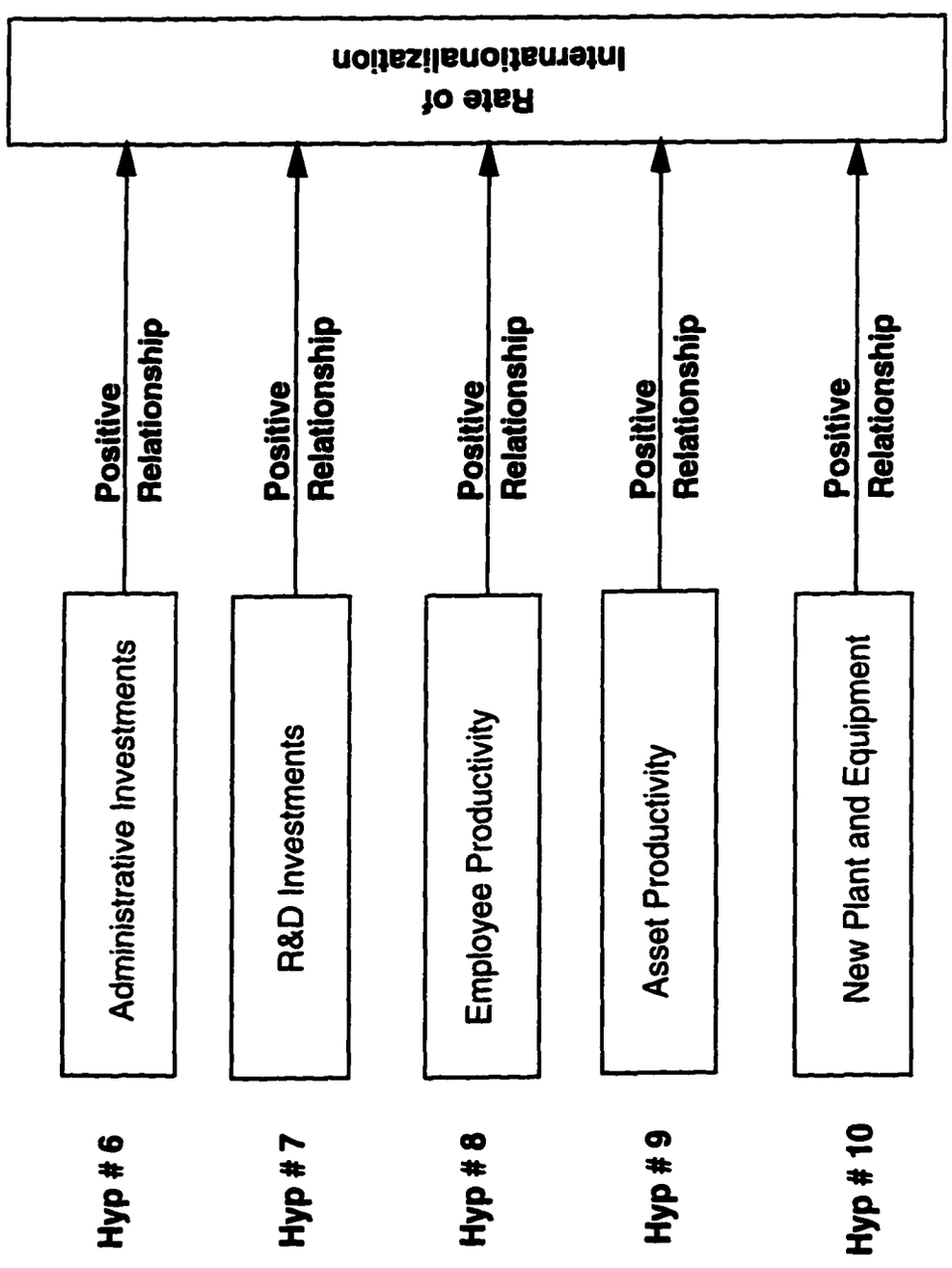


Figure 4.2: Firm Drivers - Summary



the rate of internationalization of firms. It should be noted that Equation III does not correspond to any particular hypothesis, but seeks to ask the conceptual relevance of industry and firm effects influence on the rate of internationalization of firms. Equation III will also help us understand the influence of firm effects after controlling for industry effects (vice-versa). All three equations were used for data analysis (figures 4.1 and 4.2 diagrammatically represent the various relationships that will be tested in this study).

Equation I: This Equation tests for the impact of industry drivers on the rate of internationalization.

Rate of Internationalization =

A_1 (constant) + B_1 (Domestic Market Growth Rate) + B_2 (Global Market Growth Rate) + B_3 (Domestic-Global Market Ratio) + B_4 (Import Competition) + B_5 (Concentration)

Equation II: This Equation tests for the impact of firm drivers on the rate of internationalization.

Rate of Internationalization =

A_1 (constant) + B_1 (Administrative Investments) + B_2 (R&D Investments) + B_3 (Employee Productivity) + B_4 (Asset Productivity) + B_5 (New Plant and Equipment)

Equation III: This Equation tests for the relative impact of industry and firm drivers on the rate of internationalization.

Rate of Internationalization = A_1(constant) + Set A + Set B

Set A = [Industry Drivers]

Set B = [Firm Drivers]

A particular hypothesis is supported if the following three criteria are satisfied (based on Cohen and Cohen, 1983):

a) *the contribution to Y variance of each set is tested for significance at the alpha level (.05) by the appropriate F test;*

b) *if the F for a given test is significant, the individual independent variables which make it are each tested for significance at appropriate alpha (.05) by means of standard t test or its equivalent F test; and*

c) *if the t test result is significant and the beta value is in the direction stated by the corresponding hypothesis.*

However, in the event set-wise F is not significant, no test on the constituent independent variables are performed to reduce the possibility of type I error.

SAMPLE DESCRIPTION

The section will briefly review the salient features of the various firms' characteristics and industry groups in the sample. The main purpose of this information is to see if any additional ex-post explanations can be made to various findings of this study. Due to sampling restrictions no within industry statistical analysis will be conducted (all references made in the following section pertain to tables 4.3 to 4.12).

Table 4.3. Mean of Variables Studied Across Industries

Variable	Two Digit Industry Code						
	20	28	34	35	36	37	38
GINT	6.423	5.671	3.787	16.484	10.197	3.919	9.939
GFTA	6.014	4.690	3.809	13.917	7.733	1.862	10.000
GFTS	6.833	6.651	3.765	19.051	12.661	5.975	9.879
GFTP	8.575	0.116	79.332	55.021	18.860	53.701	1.536
GDP	2.100	3.750	0.500	2.400	3.000	2.600	2.200
GNP	4.076	9.842	5.874	2.702	7.094	8.751	4.369
DGM	1.952	0.310	-2.158	-0.708	-1.371	-0.383	0.533
IMC	19.914	24.039	38.436	26.504	24.727	22.932	58.407
HHI	68.000	97.000	33.000	70.000	129.000	1044.000	150.000
SGA	0.245	0.279	0.209	0.271	0.256	0.135	0.324
RDS	0.008	0.044	0.015	0.047	0.056	0.027	0.058
EMS	156.642	142.902	80.962	100.490	79.578	99.639	87.772
APR	1.575	1.160	1.336	1.133	1.159	1.376	1.080
PEN	0.577	0.480	0.437	0.463	0.493	0.510	0.456

NOTE: GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio; GNP=Domestic Market Growth Rate; GNP=Change in Global Market Growth Rate; DGM=Domestic Global Market Ratio; IMC=Change in Import Competition; HHI=Concentration; SGA=Administrative Investments; RDS=R&D Investments; APR= Asset Productivity; EMS=Employee Efficiency; PEN=New Plant and Equipment.

Table 4.4 Table Showing Mean Levels of Internationalization Across Industries in 1982 and 1991

	2 Digit Industry Code						
Variable	**20**	**28**	**34**	**35**	**36**	**37**	**38**
INT91	29.94	35.34	32.10	35.27	30.89	22.80	33.54
FTA91	29.55	31.92	32.81	31.51	27.52	21.28	30.74
FTS91	30.32	38.76	31.39	39.04	34.25	24.32	36.33
FTP91	24.40	34.46	89.90	82.94	62.27	61.19	31.93
INT82	23.51	29.67	28.32	18.79	20.69	18.89	23.60
FTA82	23.54	27.24	29.01	17.59	19.79	19.43	20.74
FTS82	23.49	32.11	27.63	19.99	21.59	18.35	26.45
FTP82	15.83	34.35	30.56	27.92	43.42	7.49	30.39

NOTE: INT91=Internationalization during 1991; INT82=Internationalization during 1982; FTA91=Foreign Asset Ratio during 1991; FTA82=Foreign Asset Ratio during 1982; FTS91=Foreign Sales Ratio during 1991; FTS82=Foreign Sales Ratio during 1982; FTS91=Foreign Profit Ratio during 1991; FTS82=Foreign Profit Ratio during 1982.

Table 4.5 Showing Internationalization in Billions of U.S. Dollars Across Industries in 1982 and 1991

	2 Digit Industry Code						
Variable	**20**	**28**	**34**	**35**	**36**	**37**	**38**
ABSINT91	3.15	1.93	0.49	1.92	2.83	3.51	1.44
ABSFS91	3.70	2.12	0.54	1.99	2.43	3.98	1.55
ABSFA91	2.60	1.73	0.44	1.86	3.23	3.04	1.33
ABSFP91	0.37	0.25	0.06	0.10	0.20	0.06	0.14
ABSINT82	0.84	0.90	0.21	0.61	0.98	1.79	0.62
ABSFS82	1.05	1.03	0.23	0.66	1.05	2.08	0.71
ABSFA82	0.63	0.77	0.18	0.56	0.90	1.50	0.52
ABSFP82	0.07	0.10	0.03	0.07	0.03	0.11	0.06

NOTE: ABSINT91= Internationalization represented in Billions of U.S. Dollars during 1991; ABSINT82=Internationalization represented in Billions of U.S. Dollars during 1982; ABSFS91= Foreign Sales represented in Billions of U.S. Dollars during 1991; ABSFS82=Foreign Sales represented in Billions of U.S. Dollars during 1982; ABSFA91=Foreign Assets represented in Billions of U.S. Dollars during 1991; ABSFA82=Foreign Assets represented in Billions of U.S. Dollars during 1982; ABSFP91=Foreign Profits represented in Billions of U.S. Dollars during 1991; ABSFP82=Foreign Profits represented in Billions of U.S. Dollars during 1982.

Table 4.6. Table Showing Sample Firm's Growth In Internationalization Based on Firm Sales in 1991(in 000,000's of $)

	Sales < 7500 (n=47)		Sales<30000 and >=7500 (n=49)		Firm Sales => 30000 (n=62)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
GINT	13.569	15.335	10.283	10.285	6.172	12.785
GFTA	12.804	17.356	8.516	11.067	4.346	14.604
GFTS	14.333	15.605	12.051	11.196	7.998	13.001
GFTP	25.675	120.587	48.109	164.211	16.842	72.486
ABSGINT	0.071	0.082	0.286	0.213	3.033	5.171
ABSGFA	0.062	0.078	0.244	0.215	3.093	6.219
ABSGFS	0.080	0.090	0.328	0.252	2.974	4.415
ABSGFP	0.010	0.016	0.032	0.046	0.229	0.472

NOTE: GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio; ABSGINT=Growth in Internationalization represented in Billions of U.S. Dollars; ABSGFA=Growth in Foreign Asset represented in Billions of U.S. Dollars; GFTS=Growth in Foreign Sales represented in Billions of U.S. Dollars; GFTP=Growth in Foreign Profit represented in Billions of U.S. Dollars.

Table 4.7. Table Showing Sample Firm's Mean Levels of Internationalization Based on Firm Sales in 1991(in 000,000's of $)

	Sales<7500 (n=47)		Sales<30000 and>=7500 (n=42)		Firm Sales=> 30000 (n=62)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
INT91	33.66	16.99	29.74	13.06	34.40	14.43
FTA91	32.25	18.45	26.48	12.03	31.00	14.70
FTS91	35.07	17.93	32.99	16.03	37.80	15.78
FTP91	57.64	104.69	70.59	166.18	49.88	114.19
INT82	20.09	14.04	19.45	13.97	28.23	14.34
FTA82	19.45	13.90	17.97	12.87	26.66	14.37
FTS82	20.74	14.97	20.93	15.63	29.81	15.06
FTP82	31.96	50.48	22.48	26.73	33.04	65.53

NOTE: INT91=Internationalization during 1991; INT82=Internationalization during 1982; FTA91=Foreign Asset Ratio during 1991; FTA82=Foreign Asset Ratio during 1982; FTS91=Foreign Sales Ratio during 1991; FTS82=Foreign Sales Ratio during 1982; FTS91=Foreign Profit Ratio during 1991; FTS82=Foreign Profit Ratio during 1982.

Table 4.8. Table Showing Sample Firm's Growth in Internationalization Based on Number of Employees

	Employees< 100000 (n=69)		Employees< 200000 and >=100000 (n=28)		Employees => 200000 (n=61)	
Variable	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
GINT	12.077	13.973	11.663	12.250	5.973	12.031
GFTA	11.024	15.722	8.924	12.044	4.556	14.473
GFTS	13.129	14.219	14.402	14.747	7.391	11.264
GFTP	22.957	100.780	69.105	215.179	17.858	72.499
ABSGINT	0.109	0.109	0.399	0.602	3.060	5.198
ABSGFA	0.092	0.101	0.306	0.559	3.143	6.249
ABSGFS	0.127	0.126	0.492	0.701	2.978	4.441
ABSGFP	0.016	0.029	0.036	0.076	0.231	0.473

NOTE: GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio; ABSGINT=Growth in Internationalization represented in Billions of U.S. Dollars; ABSGFA=Growth in Foreign Asset represented in Billions of U.S. Dollars; ABSGFS=Growth in Foreign Sales represented in Billions of U.S. Dollars; ABSGFP=Growth in Foreign Profit represented in Billions of U.S. Dollars.

Table 4.9. Table Showing Sample Firm's Mean Level of Internationalization Based on Number of Employees

	Employees< 100000 (n=69)		Employees< 20000 and >=100000 (n=28)		Employees => 200000 (n=61)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
INT91	32.06	15.92	31.69	13.43	33.98	14.47
FTA91	29.68	16.91	28.52	13.02	30.96	14.46
FTS91	34.43	17.23	34.86	16.50	36.99	15.91
FTP91	49.38	89.02	99.06	215.08	50.48	115.00
INT82	19.98	14.75	20.03	13.10	28.01	14.06
FTA82	18.66	14.10	19.60	13.29	26.41	13.84
FTS82	21.30	16.08	20.46	13.69	29.60	15.01
FTP82	26.43	43.83	29.95	29.71	32.62	65.98

NOTE: INT91=Internationalization during 1991; INT82=Internationalization during 1982; FTA91=Foreign Asset Ratio during 1991; FTA82=Foreign Asset Ratio during 1982; FTS91=Foreign Sales Ratio during 1991; FTS82=Foreign Sales Ratio during 1982; FTS91=Foreign Profit Ratio during 1991; FTS82=Foreign Profit Ratio during 1982.

Table 4.10. Table Showing Sample Firm's Growth in Internationalization Based on Return on Investment (ROI)

	ROI<.05 (n=43)		ROI<.1 and >=.05 (n=44)		ROI>=.1 (n=77)	
Variable	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
GINT	10.844	14.110	7.854	10.386	10.033	14.214
GFTA	9.256	16.071	6.690	11.962	8.396	15.819
GFTS	12.432	15.028	9.018	10.079	11.671	14.402
GFTP	27.347	132.237	45.391	170.231	20.213	66.908
ABGINT	0.238	0.628	1.367	3.325	1.901	4.432
ABSGFA	0.163	0.610	1.474	4.423	1.899	4.998
ABSGFS	0.314	0.712	1.261	2.362	1.904	4.060
ABSGFP	-0.003	0.076	0.124	0.452	0.153	0.283

NOTE: GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio; ABSGINT=Growth in Internationalization represented in Billions of U.S. Dollars; ABSGFA=Growth in Foreign Asset represented in Billions of U.S. Dollars; ABSGFS=Growth in Foreign Sales represented in Billions of U.S. Dollars; ABSGFP=Growth in Foreign Profit represented in Billions of U.S. Dollars.

Table 4.11. Table Showing Sample Firm's Mean Level of Internationalization Based on Return on Investment (ROI)

	ROI<.05 (n=43)		ROI<.1 and >=.05 (n=44)		ROI>=.1 (n=77)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
INT91	29.71	16.49	30.68	11.43	35.83	15.36
FTA91	27.43	18.19	28.04	11.26	32.71	15.30
FTS91	31.99	17.54	33.32	13.02	38.96	17.39
FTP91	71.25	159.87	69.17	168.38	44.41	67.44
INT82	18.87	12.73	22.83	12.58	25.80	16.38
FTA82	18.18	12.25	21.35	12.29	24.31	16.06
FTS82	19.57	13.72	24.30	13.68	27.29	17.47
FTP82	43.90	85.86	23.78	25.87	24.20	30.74

NOTE: INT91=Internationalization during 1991; INT82=Internationalization during 1982; FTA91=Foreign Asset Ratio during 1991; FTA82=Foreign Asset Ratio during 1982; FTS91=Foreign Sales Ratio during 1991; FTS82=Foreign Sales Ratio during 1982; FTS91=Foreign Profit Ratio during 1991; FTS82=Foreign Profit Ratio during 1982.

Table 4.12. Table Showing Sample Firm's Growth in Internationalization Based on Return on Sales (ROS)

	ROS<.03 (n=45)		ROS<.06 and >=.03(n=60)		ROS=>.06 (n=53)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
GINT	11.203	15.282	7.395	12.554	10.876	11.841
GFTA	9.360	17.081	6.891	15.385	8.563	12.165
GFTS	13.046	16.149	7.899	10.943	13.189	13.233
GFTP	23.687	107.731	43.397	166.429	17.708	52.981
ABSGINT	0.309	0.802	1.424	3.383	2.002	4.736
ABSGFA	0.200	0.671	1.470	4.117	2.065	5.513
ABSGFS	0.418	1.002	1.377	2.867	1.939	4.153
ABSGFP	0.006	0.099	0.101	0.405	0.186	0.291

NOTE: GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio; ABSGINT=Growth in Internationalization represented in Billions of U.S. Dollars; ABSGFA=Growth in Foreign Asset represented in Billions of U.S. Dollars; ABSGFS=Growth in Foreign Sales represented in Billions of U.S. Dollars; ABSGFP=Growth in Foreign Profit represented in Billions of U.S. Dollars.

Table 4.13. Table Showing Sample Firm's Growth in Internationalization Based on Return on Sales (ROS)

	ROS<.03 (n=45)		ROS<.06 and >=.03(n=60)		ROS=>.06 (n=53)	
Variable	Mean	S.D.	Mean	S.D.	Mean	S.D.
INT91	29.80	16.44	29.28	13.53	39.13	13.05
FTA91	27.60	17.99	27.80	13.93	34.43	13.47
FTS91	32.00	17.55	30.76	14.49	43.82	14.85
FTP91	64.86	139.11	62.58	165.29	48.81	56.49
INT82	18.61	13.52	21.89	13.33	28.25	15.67
FTA82	18.25	13.26	20.91	13.34	25.87	15.29
FTS82	18.96	14.30	22.86	14.05	30.63	16.83
FTP82	41.17	84.69	19.19	30.36	31.10	25.67

NOTE: INT91=Internationalization during 1991; INT82=Internationalization during 1982; FTA91=Foreign Asset Ratio during 1991; FTA82=Foreign Asset Ratio during 1982; FTS91=Foreign Sales Ratio during 1991; FTS82=Foreign Sales Ratio during 1982; FTS91=Foreign Profit Ratio during 1991; FTS82=Foreign Profit Ratio during 1982.

SIC Industry.

Food. The food industry (SIC code 20) had the smallest representation of firms (along with metal products) in the study sample. The sample of firms in the food industry increased their international exposure by 6.423% in the 1982-91 decade. The sample of firms in the food industry had about 30% of the operations overseas. Firms in the food industry spent relatively the least in R&D as a proportion of sales, but had the highest asset productivity, employee productivity, and greatest proportion of new plant and equipment compared with other industries in the sample.

Chemicals. The chemical industry (SIC code 28) was the second largest distinct industry group in the study sample. The chemical industry had shipments of about $296 billion, employing about 853,000 people in 1991. The firms in the chemical industry had the highest level of international operations among the industries sampled for this study. The chemical industry also faced the highest industry growth domestically among all industries in the sample.

Metal Products. The metal products (SIC code 34) industry faced the greatest decline in the relative size of the domestic market compared with other industries. Surprisingly sample firms in this industry increased their international exposure minimally in terms of foreign assets and foreign sales compared with other industries. Sample firms in this industry had a quantum increase in international profits over the last decade (79.3%). This industry had the least level of concentration of any of the industries studied. Firms in the metal

products industry made 89.9% of their profits from international operations in 1991 though international operations formed only 32% of the total business.

Industrial Equipment. Industrial equipment (SIC code 35) was the largest industry subgroup representing 28% of the study sample. The sample of firms in this group had the highest increase in internationalization (16.48%). The level of international exposure for this group of firms was 35.27%, which is comparable with the firms in the chemical industry in assets and sales. However, this pattern is not held in terms of foreign profits. Firms in the industrial equipment industry made about 82.9% of their profits from international operations compared with the chemical industries 24.9%. Firms in this industry faced the lowest domestic market growth rate compared with other industries in the sample.

Electronic/Electrical Equipment. The electronic/electrical equipment (SIC code 36) industry subgroup represented 14.5% of the study sample. As a separate industry subgroup the firms in the electrical/electronic industry represented relatively average values for most of the variables studied in terms of statistics. The firms in this industry made 62.27% of their profits from international operations although international operations constituted only 30.9% of their operations. The firms in this industry had the lowest relative employee productivity compared with all other industries in the sample.

Transportation Equipment. The transportation equipment (SIC code 37) industry subgroup represented 9% of the study sample. As one may expect this industry had the highest levels of concentration compared with any other industry

in the sample (HHI=1044 compared with the average concentration of all industries in the sample HHI=272.72). Firms in this industry were the least internationalized compared with all other firms in the industry. Similar to the electrical and electronic equipment industry, the firms in this industry made 61.2% of their profits from international operations although international operations constituted only 22.8% of their operations.

Instrumentation. The instrumentation (SIC code 38) industry represented 12.5% of the sample. This industry faced the highest increase in foreign competition compared with other industries in the sample. The sample firms in this industry made the highest investments in selling and general administrative expenses compared with other firms in the various industries studied.

Firm Size.

The sample firms were split into three groups based on 1991 annual sales revenue and number of employees. Firms with a sales revenue of over $30 billion had an increase in the level of internationalization by 6.17%. Firms with a sales revenue between $30 billion and $7.5 billion increased their level of internationalization by 10.28%. Firms with a sales revenue of less than $7.5 billion had the highest increase in internationalization (13.56%). Firms with employees greater than or equal to 200,000 increased their level of internationalization by 5.9%. Firms with employees ranging from 100,000 to 200,000 increased their level of international operations by 11.66%. Firms with

less than 100,000 employees increased their extent of internationalization by 12.07%. Descriptive statistics of this study sample indicate that small firms have increased their level of international exposure during the 1982-1991 decade more than their larger counterparts.

Profitability.

The sample firms were split into three groups based on profitability (ROI and ROS). Firms with an ROI greater or equal to .1 increased their level of internationalization by 10.03%. Firms with an ROI between .1 and .05 increased their level of internationalization by 7.85%. Firms with an ROI less than .05 increased their level of internationalization by 10.84%. The sample statistics show that firms with low or high profitability internationalize to a greater extent than firms with median profitability. A similar pattern of results is found with ROS. Firms with ROS greater or equal to .06 increased their level of internationalization by 10.87%. Firms with ROS between .06 and .03 increased their level of internationalization by 7.39%. Firms with ROS less than .03 increased their level of internationalization by 11.20%.

Chapter 5

Results and Discussion

This purpose of this chapter is to present the results of the empirical analysis related to the hypotheses tested in this research. Secondly, supplemental analyses performed in this study are described. Later, empirical findings of this study are discussed and interpretations are offered.

Overview

This research was designed to empirically test the influence of two categories of drivers (industry and firm drivers) on the rate of internationalization by firms. The data collection and analytic techniques were described in the previous chapter. Table 5.1 provides the descriptive statistics and correlations for these two categories of drivers of the rate of internationalization. Correlation analysis helped to reveal whether any of the variables were highly correlated and subject to the problems of multicollinearity. This check assured that multicollinearity was not a problem and unlikely to lead to unstable results. The regression equations were analyzed using SPSS. This chapter begins by reviewing the results of the analyses and later discusses the findings. The results of regression analyses are provided in tables 5.2 to 5.9.

Table 5.1. Means, Standard Deviations, and Correlation Coefficients of the Various Variables in the Study

Variable	Mean	Std	1	2	3	4	5
1. GDP	2.625	.8220	1				
2. GNP	5.986	2.790	.6617***	1			
3. DGM	-.3090	.9917	.3296***	.0893***	1		
4. IMC	29.793	11.607	--.4162***	-.2801***	.0687	1	
5. HHI	178.28	272.72	.0403	.3376***	.0043	-.1275	1
6. SGA	.2594	.1128	.0955	-.1138	.1244	.1961***	-.3216***
7. RDS	.0423	.0352	.1832**	-.0320	-.0772	.1425*	-.0980
8. EMS	107.70	55.28	.2424***	.1822**	.3496***	-.2110***	-.0579
9. APR	1.202	.2896	-.1518**	.0459	.1253	-.1723**	.1617**
10. PEN	.4806	.1016	.0693	.0597	.1776**	-.1629**	.0898
11. GINT	9.644	13.20	-.0378	-.2882**	-.0825	.0107	-.1384*
12. GFTS	11.13	13.51	-.0184	-.2989***	-.1170	-.0356	-.1236
13. GFTA	8.15	14.86	-.0504	-.2402***	-.0402	.0514	-.1334*

*** = p<.01, ** = p<.05, *= p<.1.

Note: GDP=Global Market Growth Rate; GNP=Domestic Market Growth Rate; DGM=Change in Domestic Global Market Ratio; IMC=Change in Import Competition; HHI=Concentration; SGA=Administrative Investments; RDS=R&D Investments; EMS=Employee Efficiency; APR=Asset Productivity; PEN=New Plant and Equipment; GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio.

Table 5.1. Means, Standard Deviations and Correlation Coefficients of the Various Variables in the Study
(continued)

Variable	6	7	8	9	10	11	12	13
1. GDP								
2. GNP								
3. DGM								
4. IMC								
5. HHI								
6. SGA	1							
7. RDS	.5128***	1						
8. EMS	-.2498***	-.1311*	1					
9. APR	-.3345***	-.4211***	.1103	1				
10. PEN	.0341	-.1596**	.1897***	.0394	1			
11. GINT	.1550**	.1006	.0690	-.0589	.2166***	1		
12. GFTS	.1352*	.1275	.1316*	-.1019	.2456***	.9233***	1	
13. GFTA	.1525*	.0628	.0029	-.0120	.1614*	.9371***	.7311***	1

*** = p<.01, ** = p<.05, *= p<.1.

Note: GDP=Global Market Growth Rate; GNP=Domestic Market Growth Rate; DGM=Change in Domestic Global Market Ratio; IMC=Change in Import Competition; HHI=Concentration; SGA=Administrative Investments; RDS=R&D Investments; EMS=Employee Efficiency; APR=Asset Productivity; PEN=New Plant and Equipment; GINT=Growth in Internationalization; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio.

Table 5.2. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
(Industry Drivers Introduced First - Full Sample)
N=158

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	.9057	-2.5812**
INDUSTRY DRIVERS		
Global Market Growth Rate	.2895***	.3325***
Domestic Market Growth Rate	-.4501***	-.4909***
Change in DGM Ratio	-.1388*	-.2981***
Change in Import Competition	.0152	.1009
Concentration	.0044	.0588
FIRM DRIVERS		
Administrative Investments		.1703*
R&D Investments		.0057
Employee Productivity		.1944**
Asset Productivity		.0877
New Plant & Equipment		.2417**
Incremental R^2		.105
Incremental F		1.9464**
R^2	.129	.234
F	4.533***	4.491***

*** = p<.01, ** = p<.05, *= p<.1.

Table 5.3. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
(Firm Drivers Introduced First - Full Sample)
N=158

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	-1.044	-2.581**
FIRM DRIVERS		
Administrative Investments	.1246	.1703*
R&D Investments	.0795	.0057
Employee Productivity	.0703	.1944**
Asset Productivity	.00018	.0877
New Plant and Equipment	.2116***	.2417***
INDUSTRY DRIVERS		
Global Market Growth Rate		.3325***
Domestic Market Growth Rate		-.4909***
Change in DGM Ratio		-.2981***
Change in Import Competition		.1009
Concentration		.0588
Incremental R^2		.156
Incremental F		2.8919**
R^2	.078	.234
F	2.571**	4.491***

*** = p<.01, ** = p<.05, *= p<.1.

RESULTS

The results section presents the relevant analyses that were conducted to test all of the hypotheses. The results reported in the various tables are standardized regression coefficients. Procedurally, industry drivers were entered first, as a set, in the regression equation (referred to as set A in table 5.2). Firm drivers were introduced next, along with industry drivers, as the second set (referred to as set B in table 5.2). Industry drivers were entered first based on the arguments of the S-C-P paradigm (discussed in chapter 3). Table 5.3 provides the regression results when firm drivers are introduced first (set A), and industry drivers are introduced next, along with firm drivers, as the second set (set B). The following section reports the statistical results related to each of the hypothesis tested.

Industry Drivers

First results for hypotheses 1-5 are presented. These hypotheses address the influence of industry drivers upon the rate of internationalization of firms.

Hypothesis 1: *Other things remaining equal, a firm's growth in internationalization will be positively related to the global market growth rate of the industry in which the firm is located.*

The study findings supported Hypothesis 1 (see table 5.2). The rate of internationalization of firms was found to be positively related to global market

growth of the industry in which the firm was located (beta=.2895, p<.01). When introduced along with firm drivers as a single set, global market growth rate remained significant at the same level with an increased beta loading (beta=.3325, p<.01).

Hypothesis 2: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the domestic market growth rate of the industry in which the firm is located.*

The study findings supported hypothesis 2 (see table 5.2). Domestic market growth rate was negatively and significantly related to the rate of internationalization of firms (beta= -.4501, p<.01). When introduced along with firm drivers as a single set, domestic market growth rate remained significant at the same level with an increased beta loading (beta=.4909, p<.01).

Hypothesis 3: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the growth in the ratio of domestic market sales to total global market sales (DGM ratio) of the industry in which the firm is located.*

The findings of this study also supported Hypothesis 3 (beta= -.1388, p<.1). DGM ratio was negatively related to the rate of internationalization of firms (see table 5.2). When introduced along with firm drivers as a single set, the significance of DGM ratio increased to p<.01 along with an increased beta loading (beta=.-2981, p<.01).

Hypothesis 4: *Other things remaining equal, a firm's growth in internationalization will be positively related to the growth of import competition in the industry in which the firm is located.*

Hypothesis 4 did not receive statistical support though the beta loading for growth of imports was positive (beta=.0152, non-significant). When introduced along with firm drivers as a single set, growth of import competition remained non-significant even though there was an increase in the beta loading (beta=.1009, non-significant). The study findings found no statistical evidence linking growth of import competition and the rate of internationalization of firms (see table 5.2).

Hypothesis 5: *Other things remaining equal, a firm's growth in internationalization will be negatively related to the extent of concentration in the industry in which the firm is located.*

Hypothesis 5 did not receive statistical support (beta=.0044, non-significant). Even though the beta loading for industry concentration was very low it should be noted that the loading was directionally opposite to what was proposed by the hypothesis (see table 5.2). When introduced along with firm drivers as a single set, industry concentration remained non-significant even though there was an increase in the beta loading (beta=.0588, non-significant). The findings of this study offered no statistical evidence to link industry concentration and the rate of internationalization of firms.

Firm Drivers

Results for hypotheses 6-10 are now presented in order. These hypotheses address the influence of firm drivers upon the rate of internationalization of firms.

Hypothesis 6: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of administrative investments made by the firm.*

The study findings supported Hypothesis 6 on administrative investments (see table 5.2). Administrative investments was positively related to the rate of internationalization of firms (beta=.1703, p<.1).

Hypothesis 7: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of R&D investments made by the firm.*

Hypothesis 7 on R&D investments did not receive statistical support (see table 5.2). The findings of this study offered no statistical evidence to link R&D investments and the rate of internationalization of firms (beta=.0057, non-significant).

Hypothesis 8: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of productivity of employees.*

The study findings supported Hypothesis 8 on employee productivity (see table 5.2). Employee productivity was positively related to the rate of internationalization of firms (beta=.1944, p<.05).

Hypothesis 9: *Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of productivity of assets.*

Hypothesis 9 on asset productivity also did not receive statistical support (see table 5.2). The findings of this study offered no statistical evidence to link asset productivity and the rate of internationalization of firms even though beta loading was in the direction proposed by the hypothesis (beta=.0877, non-significant).

Hypothesis 10: Other things remaining equal, a firm's growth in internationalization will be positively related to the extent of new plant and equipment held by the firm.

The findings of this study supported Hypothesis 10 (see table 5.2). New plant and equipment was positively related to the rate of internationalization of firms. In addition, it demonstrated the highest beta loading among firm drivers (beta=.2417, $p<.01$). It should be noted that all of the hypothesized firm drivers excepting new plant and equipment (beta=.2116, $p<.01$) were statistically non-significant when firm drivers were introduced without industry drivers (see table 5.7).

ANALYSIS AND DISCUSSION OF RESULTS

The purpose of this study was to empirically investigate the various factors influencing the rate of internationalization of firms. This research forwarded ten hypotheses related to the drivers of this trend towards internationalization. Of the ten hypotheses proposed by this study, six of them were supported (see table 5.4). Industry and firm drivers jointly explained about 23.4% (R^2=.234, p<.01) of the variance in the rate of internationalization (see tables 5.2 and 5.3). Industry drivers and firm drivers, when entered independently, explained about 12.9% (R^2=.129, p<.01) and 7.8% (R^2=.078, p<.01 level significant at .05) of the variance in the rate of internationalization of firms. The Incremental R^2 was .10 (ΔR^2=.10, p<.05 level) for firm drivers when industry drivers were entered first. The Incremental R^2 was .156 (ΔR^2=.156, p<.05 level) for industry drivers when firm drivers were entered first. In summary, the results of this research supported the view that industry and firm drivers are stable and largely independent predictors of the rate of internationalization. In general, when both industry and firm drivers were run in a single set, the beta loading increased for each of the industry drivers. The following section will first describe the additional analysis performed and will then discuss the various findings of the study.

Table 5.4: Summary of Statistical Results Showing the Relationship Between the Various Drivers (Independent Variable) and the Rate of Internationalization (Dependent Variable)

Hypothesis	Independent Variable	Results
1.	Global Market Growth Rate	Supported
2.	Domestic Market Growth Rate	Supported
3.	Change in DGM Ratio	Supported
4.	Change in Import Competition	Not Supported
5.	Concentration	Not Supported
6.	Administrative Investments	Supported
7.	R & D Investments	Not Supported
8.	Employee Productivity	Supported
9.	Asset Productivity	Not Supported
10.	New Plant and Equipment	Supported

Additional analysis was performed to make the findings more robust. This was deemed necessary for three reasons. First to rule out any potential confounds which might influence the validity of the results. The concern here was to rule out any sampling and measurement related artifacts which might influence the findings. In particular, it was thought necessary to check to see whether firms which have a positive rate of growth in internationalization exhibited any differences from firms which have a negative rate of growth in internationalization. Second, it was felt desirable to see if the pattern of results held after using industry adjusted values for firm drivers. Third, because the

operationalization of the criterion variable was a composite of two ratios (foreign sales ratio and foreign asset ratio), it was believed necessary to repeat the analysis for each of the components of the criterion variable. In this way, it could be determined of rate of internationalization was best expressed as a function of foreign sales or assets. The following sections detail the results of the additional set of analysis for each of the three possible confounds (internationalization growth rate; industry adjusted values; and internationalization ratios).

Internationalization Growth Rate

The sample of firms for this study included U.S. multinational firms which experienced either positive or negative growth rates in internationalization. Therefore it was decided to split the sample into two groups (positive growth rate and negative growth rate) and then to rerun the analysis to investigate the stability of the findings across groups (see tables 5.5 and 5.6). Analysis suggests that the relationship between variables holds, regardless of the fact whether the sample contained only firms which had a positive growth rate, or firms which had a growth rate which was either positive or negative.

Positive Growth Rate. There were 121 firms in the sample with a positive growth in internationalization. When the sample was comprised of firms with a positive growth rate, the total variance explained by industry and firm drivers increased to 31.3% from 23.4% which was significant at .01 level (R^2=.313, p<.01 level). Industry drivers independently explained about 16.5% of the variance (R^2=.165, p<.01 level). Firm drivers explained 14.8% of the variance

after controlling for industry drivers (ΔR^2=.148, p<.05 level). The statistical results for industry drivers (hypotheses 1-5) with this sub-sample generally supported the pattern of findings reflected in the full sample of 158 firms. However, this is not the case with firm drivers (hypotheses 6-10). Hypothesis 6 on administrative investments failed to be significant with this sub-sample. R&D investments (hypothesis 7) though still not significant, loaded negatively with the rate of internationalization thereby marginally reversing the directionality of the hypothesis (beta= -.0336, non-significant). However, caution should be exercised in interpreting this finding as the sample size (n=121) is considerably smaller than the minimally required sample size of 150 firms needed for the study to achieve a desirable power of .9.

Negative Growth Rate. There were 37 firms in the sample with a negative growth in internationalization. Unfortunately the findings in this sample were inconsistent with the growth sample. For this sub-sample, only industry drivers were significant as a set (R^2=.296, p<.05 level). Firm drivers and the combined set of both industry and firm drivers were not significant. Except for Hypothesis 5 (industry concentration) which was supported, all other hypotheses were not supported. Hypothesis 5 loaded significantly (beta=-.5343, p<.01). This finding is not consistent with the results from the full sample of 158 firms (see table 5.2). The major weakness of these findings can be attributed to the small sample size of 37 firms.

Industry Adjusted Values

An important element of our analysis had to do with whether the relative position of the firm in an industry, or lack of position in the industry, influenced the rate of internationalization. To determine whether the relative expenditure/position of the firm in the industry played a role in the rate of internationalization, we reran the statistical analysis with industry adjusted values (see tables 5.7 and 5.8). The industry adjusted values[4] represented the value of the focal firm driver divided by the industry average value for the focal firm driver. However, this was possible for only four of the five firm drivers studied. The reason for this is that industry information on new plant and equipment was not available for two of the seven industries studied. The subsequent data analysis was repeated twice: First on the whole sample (n=158), and then a second time on firms experiencing positive growth (n=121). The results of the analysis were consistent with the previous results for non-industry adjusted values (see tables 5.2 and 5.5). The degree of stability in results suggested that the findings of the study are not influenced by the non-usage industry adjusted values.

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[4] For example:
Industry Adjusted R&D Investment =
Firm R&D Investment / Industry R&D Investment

Table 5.5. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
(Firms With Positive Growth Only)
N=121

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	1.1862**	-1.7178*
INDUSTRY DRIVERS		
Global Market Growth Rate	.3408***	.3959***
Domestic Market Growth Rate	-.4957***	-.5479***
Change in DGM Ratio	-.2399***	-.4149***
Change in Import Competition	-.00096	.1060
Concentration	.0757	.1375
FIRM DRIVERS		
Administrative Investments		.1559
R&D Investments		-.0336
Employee Productivity		.2579***
Asset Productivity		.0368
New Plant & Equipment		.2753***
Incremental R^2		.148
Incremental F		2.262**
R^2	.165	.313
F	4.564***	5.032***

*** = $p<.01$, ** = $p<.05$, * = $p<.1$.

Table 5.6. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
(Firms With Negative Growth Only)
N=37

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	-.1787	.1980
INDUSTRY DRIVERS		
Global Market Growth Rate	.0143	-.1166
Domestic Market Growth Rate	-.0588	-.1720
Change in DGM Ratio	.0463	.0266
Change in Import Competition	-.0753	-.1229
Concentration	-.5343***	-.4988**
FIRM DRIVERS		
Administrative Investments		.0650
R&D Investments		.0785
Employee Productivity		.2278
Asset Productivity		-.0802
New Plant & Equipment		-.0440
Incremental R^2		.03
Incremental F		.0934
R^2	.296	.326
F	2.607**	1.259

*** = $p<.01$, ** = $p<.05$, * = $p<.1$.

Table 5.7. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
Using Industry Adjusted Values[5] for Firm Drivers
(Full Sample)
N=158

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	.9057	-2.708***
INDUSTRY DRIVERS		
Global Market Growth Rate	.2895***	.3628***
Domestic Market Growth Rate	-.4501***	-.4627***
Change in DGM Ratio	-.1388*	-.2248***
Change in Import Competition	.0152	.1336
Concentration	.0044	-.0263
FIRM DRIVERS		
Industry Adjusted Administrative Investments		.1910**
Industry Adjusted R&D Investments		-.0270
Industry Adjusted Employee Productivity		.2116***
Industry Adjusted Asset Productivity		.0753
New Plant & Equipment		.2241***
Incremental R^2		.1093
Incremental F		2.039*
R^2	.129	.239
F	4.533***	4.638***

*** = p<.01, ** = p<.05, *= p<.1.

[5] With the exception of New Plant and Equipment

Table 5.8. Multiple Regression Results
Industry and Firm Drivers' Influence on the Rate of Internationalization
Using Industry Adjusted Values[6] for Firm Drivers
(Firms With Positive Growth Only)
N=121

Variable	Standardized Regression Coefficients	
	Set A	Set B
Intercept	1.862**	-1.826**
INDUSTRY DRIVERS		
Global Market Growth Rate	.3408***	.4455***
Domestic Market Growth Rate	-.4957***	-.5236***
Change in DGM Ratio	-.2399***	-.3393***
Change in Import Competition	-.00096	.1581
Concentration	.0757	.0653
FIRM DRIVERS		
Industry Adjusted Administrative Investments		.1221
Industry Adjusted R&D Investments		-.290
Industry Adjusted Employee Productivity		.2520***
Industry Adjusted Asset Productivity		.0273
New Plant & Equipment		3.121***
Incremental R^2		.141
Incremental F		2.133*
R^2	.165	.306
F	4.564***	4.878***

*** = p<.01, ** = p<.05, * = p<.1.

[6] With the exception of New Plant and Equipment

Ratios of Internationalization

This study's operationalization of internationalization utilized two sub-components (foreign sales ratio and foreign asset ratio). Since most previous research had operationalized internationalization as one of the above ways, it was felt necessary to statistically test for the relationship between the various sub-components of internationalization and the various independent variables (see tables 5.9 and 5.10).

When the rate of internationalization was operationalized as change in foreign sales ratio the variance explained was 30.88% (R^2=.3088, p<.01 level) when all the drivers are added together as a set. When the rate of internationalization was operationalized as change in foreign asset ratio the variance explained was 13.97% (R^2=.1397, p<.01 level) when all the drivers are added together as a set. When the criterion variables operationalized as single ratios, the strongest support was found for foreign sales ratio (see tables 5.9 and 5.10). This was followed by the foreign asset ratio. All of the hypothesis except Hypothesis 5 showed a consistent pattern in findings irrespective of the way internationalization (foreign sales ratio, foreign asset ratio, or a composite of both) was operationalized. Hypothesis 5 on industry concentration loaded in the direction proposed when the dependant variable was foreign asset ratio while this pattern was not held for the other two operationalizations of the dependant variable (beta=-.0221, non-significant).

Table 5.9. Multiple Regression Results
Industry Drivers' Influence on the Rate of Internationalization
(Full Sample)
N=158

Variable	Standardized Regression Coefficients		
	GINT	GFTS	GFTA
Intercept	.9057	1.054*	.7566
Global Market Growth Rate	.2895***	.3456***	.2001*
Domestic Market Growth Rate	-.4501***	-.5099***	-.3360***
Change in DGM Ratio	-.1388*	-.1843**	-.0790
Change in Import Competition	.0152	.0176	.0431
Concentration	.0044	.0331	-.0221
R^2	.1297	.1641	.079
F	4.533***	5.969***	2.607**

*** = p<.01, ** = p<.05, *= p<.1.

Note: GINT=Growth in Internationalization; GFTS= Foreign Sales Ratio; GFTA= Foreign Asset Ratio.

Table 5.10. Multiple Regression Results
Firm Drivers' Influence on the Rate of Internationalization
(Full Sample)
N=158

Variable	Standardized Regression Coefficients		
	GINT	GFTS	GFTA
Intercept	-1.044	-.936	-1.152
Administrative Investments	.1246	.0811	.1476
R&D Investments	.0795	.1206	.0316
Employee Productivity	.0703	.1274	.0091
Asset Productivity	.00018	-.0474	.0434
New Plant & Equipment	.2116***	.2397***	.1579**
R^2	.078	.106	.049
F	2.517**	3.637***	1.583

*** = p<.01, ** = p<.05, *= p<.1.

Note:GINT=Growth in Internationalization; GFTS= Foreign Sales Ratio; GFTA= Foreign Asset Ratio.

INDUSTRY DRIVERS - Discussion

Hypotheses 1-5 examined the relationship between industry drivers and the rate of internationalization of firms. In each of these hypotheses the independent variables were industry level variables for the year 1982-89. The dependant variable was the rate of internationalization of firm for the years 1982-1991. Three of the five hypotheses received support. The general finding of this study, therefore, was that global industry characteristics influence the rate of internationalization of firms. The hypotheses are now discussed in turn.

Global Market Growth Rate (Hypothesis 1): This hypothesis examined the relationship between global market growth rate and the rate of internationalization of firms. Anecdotal evidence (Studer, 1994) and theoretical rationale (Vernon, 1966) suggested that growing international markets offer an opportunity for additional profits when manufacturing costs are already committed and scale economies are achieved. As discussed previously, the pace of international market growth could encourage firms to internationalize as a means of preventing rivals from becoming dominant in potentially high-growth global markets. This finding supports the hypothesis that growing international markets is an important driver of internationalization. Global market growth rate explained the second highest amount of variance among the various industry drivers of internationalization. This evidence suggests that growing international markets offer growth opportunities that may induce firms to internationalize their

operations.

Domestic Market Growth Rate (Hypothesis 2): This hypothesis examined the relationship between domestic market growth rate and the rate of internationalization of firms. The proposed hypothesis was based on previous research (Bradburd and Caves, 1982) that the growth of domestic markets in which the firm operates usually sets a "cap" on firm growth and profitability. Therefore it was proposed that firms in growing domestic markets are likely to focus more on the domestic market rather than international markets. The logic of this assertion is straightforward. All things remaining equal, firms will prefer the activity of fine tuning their local operations to maximize profits rather than embarking on riskier foreign market adventures. The findings of this study support this contention. The evidence suggests that a positive domestic market growth rate encourages managers to focus on domestic operations. Again, the apparent preference of management to focus upon the domestic market is reasonable considering the lower managerial risk involved for the firm in local markets. One needs to keep in mind, however, the desirability of this type of behavior (maximizing returns in domestic markets). This behavior in the past has been blamed for the failure of many U.S. firms to capitalize on overseas market opportunities. It might be advisable to consider international markets prior to domestic market decline in order to gain an earlier and potentially easier foothold in international markets.

DGM Ratio (Hypothesis 3): This hypothesis examined the relationship between domestic-global market ratio and the rate of internationalization of firms. This hypothesis, was based on previous theoretical claims of Shapiro and Taylor (1990) that the size of the domestic market compared with international market influences the industrial prospects of firms. Based on Shapiro and Taylor, this study operationalized a new variable which was labeled Domestic/Global market ratio (DGM ratio). DGM ratio was operationalized as the total domestic market sales divided by total global sales for a particular industry. To the knowledge of this author, this research is currently the only study to have empirically tested this variable. The current research supported Shapiro and Taylor's (1990) premise that the size of the domestic market relative to global market can influence a firm's prospects of growth in the domestic market and hence influences a firm's motivation to internationalize.

Import Competition (Hypothesis 4): This hypothesis examined the relationship between import competition and the rate of internationalization of firms. Theoretical rationale and empirical evidence (Katics and Peterson, 1994) suggested that import competition will eventually lead to erosion of domestic firms' market position and profits. In this situation it was proposed that firms would attempt to internationalize based on the "exchange of threat" hypothesis proposed by Graham (1978; 1990). Graham postulated that companies seek to operate in competitors' home countries/market to be able to retaliate and deny

any competitive advantage to rivals. A large amount of anecdotal evidence can be found where firms show this type of behavior. For example, in 1983 Netherlands based Philips purchased Westinghouse's lighting division. This set U.S. based GE on an international acquisition spree as GE was not competing in Philips' primary markets in Europe. GE increased its international exposure by purchasing Tungstram of Hungary, Thorn-EMI lighting division, and concluded a joint venture with Hitachi of Japan in Asia. GE's lighting division's international sales which were at 20 percent in 1988, are estimated to reach more than 50 percent in 1996 (Jeannet and Hennessey, 1995).

Despite consistent theoretical and empirical evidence in the literature, Hypothesis 4 was not supported. One of the surprises of this study was that import competition failed to be significant in any of the relationships tested although the non-significant beta loading was in the hypothesized direction. Import competition loaded negatively (beta= -.1229, statistically non-significant) when tested with a sub-sample of firms whose rate of internationalization was negative. The reason for this is not clear. However, one should note that this study operationalized import competition as change in level of import competition for the years 1982-1987 whereas previous studies used an absolute measure of import competition.

Concentration (Hypothesis 5): This hypothesis examined the relationship between industry concentration and the rate of internationalization of firms. It

was proposed that larger firms would be less dependant than smaller firms on the global markets to remain competitive, and therefore would not be interested in internationalizing to a greater degree. The primary theoretical reason for this expectation was the market power rationale advanced earlier in the hypothesis section (see chapter 3). This study found industry concentration positively related (though non-significant) to the rate of internationalization of firms. Interestingly, this hypothesis was supported with an extremely large negative beta loading for the sub-sample of firms having negative rate of internationalization (see table 5.6).

One possible explanation for why this might have occurred is that this hypothesis may only hold for firms which enjoy the dominant market position in concentrated industries rather than for all firms in an industry. Smaller firms in concentrated industries could be more dependent on global markets to remain competitive relative to larger firms (Daniels and Radebaugh, 1994). For example, Mascarenhas (1986) reports that " international markets can present attractive opportunities for follower firms to avoid direct competition with leaders" (pg. 4). In order to test whether this assumption was right, it was decided to regress market power[7] (independent variable) with the rate of internationalization (dependent variable). Statistical evidence offered support for this assumption (beta=-.269, $p<.01$). Market power was negatively related to the rate of

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[7] To test this assertion market power was defined in terms of relative firm size. Hence was operationalized as follows:

Market Power = Firm Sales / Average Firm Sales

internationalization of firms as proposed in the hypothesis thereby confirming the view that large sized firms are less likely to internationalize than smaller sized firms.

Further reasoning for the lack of support for hypothesis 5 could be that firms in concentrated industries can absorb higher capital costs and risks involved in international operations, while at the same time be able to replicate their capabilities much more efficiently than firms with a small market share (Morrison, 1990; Yip, 1988). High market share held by firms in a single market is also likely to lead to higher profitability and thereby provide resources for internationalization. Secondly, for a firm in a concentrated industry gaining domestic market share beyond a certain level could be very costly for a firm, so that the firm may find its resources can be better used in international markets.

FIRM DRIVERS - Discussion

Hypotheses 6-10 examined five firm drivers and their influence on the rate of internationalization of firms. In all of these hypotheses, the independent variables were firm level values for the year 1982-89. The dependant variable was the rate of internationalization of the firm for the years 1982-1991. Three of the five hypotheses received support. The findings of this study generally supported the relevance of firm characteristics in influencing the rate of internationalization of firms.

Resources in Administration and R&D (Hypothesis 6 and 7): Hypotheses 6 and 7 examined the relationship between firm resources and the rate of internationalization by firms. The logic of these hypotheses is based on Hymer's theory of the multinational firm (discussed in chapter 3) where he proposed multinational firms exist because they possess "unique assets" in terms of products, processes, and skills. This study operationalized firm resources as investments in administrative and selling expenses and research and development. Hence the hypotheses proposed that firms with resources would internationalize to a greater degree than without such resources. To correct for the effect of firm sales, these variables were operationalized as a ratio with respect to total sales.

The analysis found that administrative investment made by a firm was positively related to the rate of internationalization. Firms apparently need to invest in their brands, sales support, and employees, despite incurring higher expenditure before going abroad. The study found that the relationship between R&D investment and the rate of internationalization was not supported, although the beta loading was in the direction proposed by the hypothesis. However, it should be noted that R&D investment is related negatively with the rate of internationalization with the sub-sample of firms experiencing positive growth. It is not clear why this occurred. Some potential reasons are discussed below.

Although previous research evidence consistently supported the notion that R&D investment is related to internationalization of operations, there have

been two instances where contrary evidence was reported. For example, Lall and Siddharthan (1982) found that certain firms internationalize by buying investments in R&D intensive sectors. Similarly, Clegg (1987) reports that R&D investment was negatively related to foreign investments in the U.S.A. and Sweden. Alemida (1996) reports that in the semi-conductor industry, foreign direct investment is directed towards acquiring other firms' technologies rather than using international operations as a medium for exploiting firm-specific advantages as proposed in the theory of multinational firm (discussed in Chapter 3). The research findings also suggest that R&D investments are not necessary for firms internationalizing their operations. Another possible explanation for this behavior could be the international product life cycle theory proposed by Vernon (1966). Based on Vernon's theory, it could be argued that firms with R&D intensive products in the growth stage of the product life cycle may not internationalize their investments overseas. Some support can be found for this contention (see 5.10). For example, R&D investments are more strongly related to the growth of foreign sales ratio (beta =.1274, non-significant) than foreign asset ratio (beta=.0316, non-significant). This means that firms are more likely to internationalize their sales (to spread R&D costs) but likely to retain their assets domestically.

Operational Efficiency (Hypotheses 8 and 9): Hypotheses 8 and 9 examined the relationship between the efficiency of the firm and the rate of

internationalization. The underlying logic of these hypotheses was based on the repeated proposition in the business literature that firms need to be efficient and productive in order to succeed both in global and domestic marketplaces. Efficiency was operationalized in two ways: 1) employee efficiency and 2) asset efficiency. Employee efficiency was operationalized as an eight-year average of sales revenue/number of workers. Asset efficiency was operationalized as an eight-year average of total sales revenue/assets. Both of these variables are relative indicators of a company's ability to use employees/assets efficiently to generate sales when compared to other companies. Additionally, such a measure also eliminates the size-effect among different companies.

Employee productivity showed a strong and a consistent pattern as anticipated thereby confirming that efficient firms tend to experience faster sales growth overseas. The strong showing of this variable is consistent with current business practices that involve shedding a large number of employees through layoffs and restructuring as a means of improving efficiency.

Asset productivity was found to be negatively related to the rate of internationalization when tested independently of industry drivers. However, this loading became positive once industry drivers were added to the equation. As a future line of research, it might be worthwhile looking into this behavior of asset efficient firms. It is suggested by the author of this dissertation (independent of empirical evidence -- as this study did not address managerial risk perceptions of internationalizing operations) that firms following a strict cost-based strategy may

shrink from expanding international operations due to perceived fear of inefficiencies that may arise when internationalization is conducted.

New Plant and Equipment (Hypothesis 10): This hypothesis is very important due to the noticeable attention given to the need for investing in new plant and equipment by U.S. firms. For example, studies on the steel industry have indicated that U.S. firms lost competitiveness due to the lack of investment in manufacturing (CTIETI, 1985). These studies allude to the fact that outdated and inefficient plant and equipment, coupled with other factors, led to the decline of the steel industry (CTIETI, 1985). Hypothesis 10 spoke to the linkage between new plant and equipment and the rate of internationalization of firms. All analyses conducted in this study supported this hypothesis. New plant and equipment was one of the important firm drivers. This finding is consistent with studies undertaken by Hatten and Schendel (1977) and Hatten, Schendel, and Cooper (1978) on the brewery industry where new plant and equipment was shown to be a critical variable for success and growth of firms.

In conclusion, this study's findings on firm drivers (namely administrative investments, employee efficiency, and new plant and equipment) offered strong support for Williamson's (1991) claim that "the best strategy is to organize and operate efficiently" (p. 75). These drivers were found to be critical indicators of a firm's likelihood to increase its exposure in international markets. Implications of these findings are discussed in the next chapter.

DESIGN CONSTRAINTS OF THE STUDY

Most dissertation research studies are somewhat limited in their scope because of constraints in resources, time, and data analysis. The present study is no exception. As in any study, this study is characterized by inherent limitations of the research process. Three primary constraints of this study are: sample related issues, cross-sectional design and emphasis upon secondary data.

First, the findings may not be generalizable to small firms as these firms may face much higher financial resource constraints compared to the large firms studied in this sample. The sample of firms used in this study was also restricted to seven manufacturing industries only. Therefore, generalizability of this study's findings is best restricted to these industries. Future research should target additional industries.

This study is cross-sectional in nature and hence subject to the limitations associated with such research designs. The emphasis of this study was to find "useful stylized facts" (Schmalensee, 1989: pg. 952) or statistical regularities (Nolle, 1991: pg. 60) rather than to make causal inferences. Hence, the goal was to find distinct patterns in industry and corporate characteristics and how these relate to the rate of internationalization by firms. Emanating from these findings are patterns that should allow firms to make inferences about potential industry and corporate drivers as well as identifying fitting internationalization strategies. Replication of the results of the current study through longitudinal

case studies should be helpful in overcoming its deficiencies.

A major assertion of this study is that certain firm level characteristics serve as drivers of the rate of internationalization of firms. In this study we chose to develop and measure variables that can be measured objectively. While this approach contributes to greater potential replicability, it also rejected different measures used by other scholars. Hence, inevitable tradeoffs occurred particularly given the study's emphasis upon secondary data as the source of empirical measures. Two critical firm level constructs that contribute to firm level differences, administrative heritage[8] and managerial aggressiveness[9] were not included. Administrative heritage and managerial aggressiveness account for managerial and organizational orientations and preferences to undertake certain strategies including internationalization. Thus, to the extent to which administrative heritage and managerial aggressiveness impact the rate of internationalization, this impact is not captured in this study.

These limitations, while a fact of social science research, need not limit the usefulness of this study. Rather, understanding these limitations should enable us to clearly delineate boundary conditions within which the

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8 In brief, *administrative heritage* refers to organizational ethos and institutional memory and how they impact an organizational outlook, propensity to take risk in response to external threats and opportunities, and the extent of managerial discretion in ordering and mobilizing the firm's physical and human resources (Bartlett and Ghoshal, 1989).

9 *Managerial aggressiveness* refers to the degree to which the firm's "dominant coalitions" (Johnson, 1988) of top decision-makers are willing to take greater risks than an industry's prevailing norms, or to deviate from the firm's traditional norms of behavior and *modus operandi* in response to perceived opportunities and threats both from within and outside the organization (Ansoff and McDonnell, 1990).

interrelationships among variables are most likely to be empirically supported, and to identify the specific firm populations to which these results pertain.

Chapter 6

Concluding Observations

This study found that global market growth rate, domestic market growth rate, relative size of domestic market to international market, employee productivity, administrative investments as well as new plant and equipment influenced internationalization by firms. Industry and firm drivers together explained about 23% of the variance of the rate of internationalization of firms. Later, implications of this research and directions for future research are offered.

Overview.

Foreign direct investment made by firms globally rose by 40% to $315 billion in 1995 compared to the previous year (UNCTD, 1996). Currently, the total aggregate foreign direct investment made by all firms globally was at $2730 billion, with affiliate sales of $6022 billion (UNCTD, 1995; 1996). Given current trends in globalization, it would be safe to say that international operations of MNCs will continue to grow in the coming decades. MNCs are no longer viewed as a new source of imperialism (Vernon, 1966) but as an "engine of growth" (UNCTD, 1992) in host countries (i.e., sources of generation of economic wealth). Many reasons exist as to why this change in attitude happened. They include:

- The growing acceptance of "market-based" solutions to economic problems rather than traditional approaches to managing the economy. This application of market-based trends has countries to encourage MNCs' investment as a means to increase capital availability, employment, efficiency of the economy, and technology diffusion.
- The end of the Cold War coupled with the increasing economic woes of the first world has lead to a decline in "soft" money for poorer nations. This has lead these nations to embrace MNCs and offer them special incentives to create investments in infrastructure projects.
- Managers of corporations have also realized the need for firms to operate internationally if they are to succeed and survive (i.e., remain competitive) in the long run. For many firms international operations is not a matter of choice but a necessity.
- The formation of trade blocks and reduction in tariffs through multilateral trade agreements has increased the ability of MNCs to grow and operate much more easily within the current global environment.

All these trends have resulted in more firms seeking global markets than ever before. This trend has also lead to the emergence of a new group of multinationals from the third world (mainly from Korea, Taiwan, Singapore, Hongkong). Many nations have realized that their future will be dependent upon their ability to compete with one another for the capital and resources of multinational firms. It is in this context, the study holds relevance to current business needs.

This study was based on the theoretical foundation of three set of theories: Theory of multinational firm, S-C-P paradigm, and Resource-based view of the firm. The next section addresses the twin issues of theoretical and managerial implications of this research. Later, directions for future research are provided. This chapter concludes with a brief synopsis of study.

IMPLICATIONS OF FINDINGS

Theory of Multinational Firm

This study contributes to our understanding of the multinational firm in three ways. First, this study provides empirical validity to previously untested claims about the importance of industry and firm drivers in formulating international strategies. The concept "driver" was originally proposed by Yip (1986; 1992). Drivers are certain environmental conditions that determine the extent of internationalization potential of an industry. Most of the previous work on these drivers was based on extensive case studies (e.g., Porter, 1986). Although these case studies provide a good solid basis for making inductive albeit qualitative observations, they nevertheless lack the scientific rigor. This study applied/operationalized the concept of drivers that was largely macro-oriented (industry) to a firm level construct (i.e., rate of internationalization) and empirically tested this concept. This study also provides empirical evidence that "relationships" (Lirtzman, 1990: pg.9) exists between drivers and the rate of internationalization by firms.

Two, the present study also suggests a need to modify Hymer's Theory of the Multinational Firm (Hymer, 1976). Hymer proposed that MNCs exist because they possess a unique set of resources which allow them to succeed in the market place. While the presence of resources may induce a firm to become multinational, this study's findings point to the fact that a firm may also internationalize to search for resources (technology, managerial skills, raw materials, etc.). Hence, a lack of firm specific resources might also lead a firm to becoming a multinational.

Notwithstanding the various theories of the multinational firm, this study tested for relationships outside the domain of the current theoretical framework. For example, current theories (discussed in chapter 3) in this area (which are static in nature) propose why certain firms would internationalize as opposed to other firms which remain primarily domestic-oriented. These theories do not offer any rationalization or explanations as to why firms choose to increase (or decrease) their exposure in international markets. An important contribution of this research to the literature on internationalization is that dynamic factors (e.g., global market growth rate, change in DGM ratio) can also influence internationalization. Thus, future theory will have to broaden its set of explanatory factors with variables that are useful in predicting the rate of internationalization.

S-C-P Paradigm

The study offers two contributions to the S-C-P paradigm. The first

contribution is at a conceptual/theoretical level and the second is at an empirical level. The following paragraph will explain the theoretical contribution and the subsequent paragraph will explain the contribution of the study at the empirical level.

Theoretical. This study's findings throw light on the theoretical debate within the Structure-Conduct-Performance paradigm (S-C-P paradigm was discussed in Chapter 3). This study was based on the rationalization of the S-C-P paradigm and hence had regressed the dependent variable (rate of internationalization) on firm and industry drivers. As with any theoretical premise, several criticisms have been made against the S-C-P paradigm (discussed in chapter 3).

The proponents of this paradigm, generally referred to as "Structuralists" (structure plays an influential role in strategy) were opposed by a group of researchers referred to as "Antistructuralists"[10]. These Antistructuralists were associated with the "Chicago school" which was known for its questioning of the directionality and logic of the S-C-P paradigm. Another group of scholars, which represented a more moderate view, was referred to as the "Behaviorist

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[10] *Antistructuralist View*: In this view, each firm's efficiency is said to be the determinant of its position in the market and its behavior. For example, an Antistructuralist will argue that a firm's efficiency, luck and high profits, will result in increased market share for that firm and thereby influence industry structure. In other words, the Antistructuralist view reverses the direction of causation of the S-C-P paradigm. The Antistructuralists also claim that high profits made by a firm is not due to monopoly position held by a firm, but due to superior efficiency.

view"[11] (Scherer, 1980). The Behaviorist view agrees with the basic premise of the S-C-P paradigm but questions some assumptions and methodologies used in testing this paradigm. The following section briefly comments on the validity of their criticisms with respect to this study's findings.

This study used industry structure variables and firm conduct variables and found that both of these sets of variables significantly explained variance in firm strategy. Hence, both industry structure variables and firm characteristics influence the internationalization strategy of the firm. The study findings offer no support for the Antistructuralist view that industry structure lags strategy outcomes of firms. Similarly, the strong showing of firm level variables in outcomes provided little support for the Behaviorist view. It is evident, however, that the study findings offer strong support for the "weak" interpretation of the S-C-P paradigm that acknowledges that linkages exist between the various elements in the paradigm, but points to the fact that the relationships may not be deterministic as proposed in the original or "strong" interpretation of the S-C-P paradigm.

The weak interpretation of the S-C-P paradigm is generally consistent with the strategic management paradigm and notion of "fit" stressed in strategy literature. The strategic management paradigm states that firms, while

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[11] *Behaviorist View*: The Behaviorist's view is usually supportive of the basic tenet of the S-C-P paradigm. However, the Behaviorist view questions one of the assumptions of scholars like Bain (1959), that the conduct of firms can be ignored while testing for empirical links between market structure and performance (Scherer, 1980). Bian justifies the approach taken by previous scholars in the following manner: 1) Acceptable predictions can be made by using market structure variables alone; 2) inclusion of conduct in structure performance relationships will lead to ambiguous predictions, and, 3) testing for conduct may be difficult as firm level information is not available.

formulating strategies, need to act within the confines of existing industry structure, and its own organizational capabilities and characteristics to achieve the best "fit" or co-alignment (Andrews, 1971; Hofer and Schendal, 1978).

Empirical. The findings of the study may suggest the need for a broader operationalization of industry structure. Traditionally industry structure was operationalized using three elements believed to affect firm profitability in a given industry (Martin, 1979). These are: 1) Factors that influence rivalry and the ease of collusion in an industry, 2) entry barriers, and 3) demand conditions. As measuring these constructs directly is a difficult task, past research used proxy measures to capture these constructs (Schmalensee, 1989). For example, ease of collusion is often proxied through measures of seller concentration in the market, and the amount of imports prevalent in the industry (Clarke, 1985). Similarly, entry barriers can be measured through the degree of product differentiation (measured as advertising intensity and research intensity), economies of scale present in the industry, and asset intensity. Market growth rate is used as a proxy for demand conditions (Clarke, 1985).

Taken in full measure, findings yielded from the newly operationalized DGM ratio and global market growth rate highlights the need for a broader definition of industry structure. This definition should not only incorporate domestic market characteristics, but should also incorporate global market characteristics. Specifically, this study's findings call for future studies to incorporate global market growth rate and DGM ratio as important elements of

industry structure research.

Resource-Based View of the Firm

The linkage between a corporation's characteristics and its strategic options has been extensively studied and well established under the rubric of the "resource-based view of the firm" (Barney, 1991; Wernerfelt, 1984). The origins of this view of strategy can be traced to Penrose (1959) who stated that a firm is a collection of physical, human and intangible assets deployed by administrative decisions (pg. 24). In this view of strategy, it is argued that firm characteristics set the limit, motivation, direction and profitability of a firm's strategy (Penrose, 1985; Mahoney and Pandian, 1992). Using a similar logic, one may say that a firm's resources and capabilities influence the strategy of internationalization undertaken by the firm. This study's findings supports the general premise of the resource-based view. More importantly, this study offers empirical evidence that shows certain types of firm specific resources (i.e., efficiency in operations, administrative investments, new plant equipment) are key to determining which firms will internationalize which supports the resource-based view of the firm.

MANAGERIAL IMPLICATIONS

The study's findings also offer guidance for managerial and public policy activities. First, this study provides a better understanding of the factors influencing a firm's ability to internationalize. For example, while a firm is

formulating an internationalization strategy, the study's findings offer insights about what would be a reasonable target for a firm in terms of an international operations growth rate within one's industry context.

Second, managers would be better served by using the findings of this study during competitive analysis in identifying and estimating the growth of potential rivals in international markets. For example, by using information about growth of domestic market or global market along with the change in the DGM ratio, a firm may be able to anticipate future trends with regard to competition in the industry.

Third, the study offers guidance for managers by helping managers understand the influence of the domestic market/industry context while internationalizing their business operations. A couple of trends in this regard should be noted. At the firm level, smaller sized firms and firms with relatively high administrative investments are internationalizing faster than firms which are larger sized and have lower administrative investments. In particular, the study's findings suggest the need to maintain updated plant and equipment and to have a high degree of efficiency while internationalizing operations. Firms with growing domestic markets seem to focus on local markets. As discussed in chapter 5, it might be advisable for these firms to expand internationally when the domestic market is growing and there is enough "managerial slack" available for the firm. This "managerial slack" could provide firms with critical resources during the difficult process of expansion in the international market. Managers of firms need to be aware that it may be inadvisable to wait for domestic market

growth to slow before expanding to international markets. This has led to disastrous consequences in the past.

At a public policy level, this study's findings show the importance of how governments can facilitate internationalization of firms. Many nations around the world are attempting to attract international investments. Intense competition of this nature can be seen in countries such as India, China and Indonesia, all of which offer a potentially large domestic market with differing political and social systems. Based on the findings of this study, it may be said that these nations should attempt to create opportunities where multinational firms can operate efficiently. The ability of firms to be efficient in operations may not only bring new capital into these countries but also it may provide firms based in these countries the option to expand internationally.

FUTURE RESEARCH

This study looked at factors influencing the rate of internationalization of firms. Empirical tests were conducted to test for the existence of linkages between various industry and firm drivers and the change in the extent of internationalization of firms over a ten-year period. Another approach to test the extent of this relationship, would be to use discrete time periods and measure the difference in these relationships at specific time periods. This would allow the evaluation of the changes from one time period to another as well as from the entire ten-year period under study.

A missing link in this research is performance. As discussed previously the findings of various studies on the relationship between measures of internationalization and firm performance are not conclusive. Therefore, a fruitful area of research could be to test if there is any moderating/mediating affects of industry and firm drivers on the relationship between internationalization and performance.

The present study used manufacturing firms as its primary sample. As an extension of this study, future research may attempt to test the influence of these drivers on service industries to test whether the pattern of findings of this study hold up with service industries. This study was also a single country study. One may also try to study the same topic in different country settings to test for country of origin effects.

Certain directional and bi-directional relationships between the various industry and firm drivers were deliberately ignored as the focus of the current

study was the influence of firm and industry drivers on the rate of internationalization. In the interest of parsimony, the relationships outside the focus of the study were dropped from analysis. Hence future studies may attempt to study the various bi-directional and interactive relationships and their influence on internationalization.

Conclusion: This research is contributory to our existing understanding of internationalization in several ways. Unlike many previous studies on internationalization that attempted to explain the variance in the rate of internationalization, this study tested for the factors influencing the change in the extent of internationalization by firms. The need for such studies that investigate the competitive dynamics of international strategy has been stressed in the literature (e.g., Rumelt, Schendel and Teece, 1994), but has been implemented only to a minimal degree. To this end, the present research was able to add empirical evidence to the internationalization literature by identifying factors that explain 23 percent of the variance of the rate of internationalization by firms.

Appendix 1. Empirical Studies on Measures of Internationalization and Performance

Author	Sample	Findings
Hirsh & Lev (1971)	396 firms from Denmark, Netherlands and Israel.	Firms with internationally diversified sales had higher stability in sales revenue.
Leftwich (1974)	298 U.S. MNCs during the years 1966 and 1970.	MNCs outperformed domestic companies in profitability. Size of the overseas affiliate was found to have a U-shaped relationship to profitability.
Severn & Laurence (1974)	48 MNCs and 70 domestic U.S. firms during the Years 1960 and 1965.	MNCs with high R&D tended to invest overseas. Overseas investment had no relationship with profitability.
Hughes, Logue & Sweeney (1975)	46 MNC's and 36 domestic U.S. firms during the years 1970-73.	Limited support was found for the notion that multinationals have higher risk-adjusted performance (based on stock market returns) when compared with domestic firms.
Wolf (1975)	Cross-sectional Data from U.S. Government sources for the years 1963 and 1966.	Firm size and technological intensity was related to overseas operations. Firms with overseas operations outperformed firms which were domestic.
Agmon & Lessard (1977)	217 U.S. MNC's for the period 1959-1972.	Stock prices of firms with international operations have returns that reflect international stock indexes.
Buckley, Dunning & Pearce (1978)	Largest 500 U.S. MNCs and 300 non-U.S. MNCs for the years 1962, 1967 and 1972.	Nationality and industry were found to have stronger influences on profitability for U.S. firms than for non-U.S. firms. The relationship between multinationality and performance was inconclusive.
Aggrawal (1979)	187 U.S. MNCs for the year 1974.	Internationalization was associated by decreased systemic risk and increase of P/E ratio.

Author	Sample	Findings
Mikhail & Shawky (1979)	30 U.S. MNCs for the years 1968-75.	MNCs offered better absolute and risk adjusted return compared to S&P 500 index companies.
Miller & Pras (1980)	246 U.S. MNCs for the years 1961, 1965 and 1968.	Internationalization was related to a higher stability in operating income.
Errunza & Senbet (1981)	Varied number of U.S. MNC's during differing periods of 1959-1977.	Firms with international operations were benefited by higher stock prices.
Berwer (1981)	150 U.S. MNCs and 137 domestic firms for the years 1963-1975.	No significant differences were found in risk-adjusted returns between MNCs and domestic firms.
Siddharthan & Lall (1982)	74 U.S. MNCs for the years 1976-79.	MNC profitability was positively related to growth in international sales.
Fatemi (1984)	84 U.S. MNCs and 52 non-U.S. MNC's during the period 1971-80.	Firms with international operations were benefitted with higher returns (higher stock prices and greater dividends) compared to other firms.
Errunza & Senbet (1984)	402 U.S. MNCs during the year 1970-1978.	Firms with international operations were benefitted by higher stock prices.
Thompson (1985)	46 U.K. MNCs for the years 1974-78.	Systemic risk of a MNC stock was negatively related with the level of international operations.
Shaked (1986)	58 U.S. MNCs and 43 domestic firms for the years 1980-82.	MNCs were found to have lower systemic risk, and reduced failure probabilities and variability in equity.
Michel & Shaked (1986)	58 U.S. MNCs and 43 domestic firms for the years 1973-82.	The average systemic risk of MNCs were lower than domestic firms. Domestic firms outperformed MNC's in terms of risk-adjusted stock-market based performance.

Author	Sample	Findings
Grant (1987)	304 British MNCs for the years 1972-84.	Internationalization was found to be related to increased sales and profitability.
Buhner (1987)	40 German MNCs for the years 1966-1981.	Internationalization of firms lead to increased performance in terms of ROA, ROE, stock market returns and reduced risk.
Doukas & Travlos (1988)	301 foreign-acquisition announcements by 202 U.S. firms in the years 1975-83.	Foreign acquisitions by U.S. firms in new industries, new geographic markets and less-developed economies led to abnormal stock market returns for acquiring firms.
Grant, Jammine & Thomas (1988)	263 British MNCs for the years 1972-86.	Internationalization was found to be positively related to profitability.
Haar(1989)	150 U.S., European, and Japanese MNCs for the years 1976-1985.	No relationship between internationalization and performance.
Chang & Thomas (1989)	71 U.S. MNCs for the years 1977-81.	International diversification was negatively related to return on assets.
Daniels & Bracker (1989)	116 U.S. MNCs for theyears 1974-83.	The relationship between internationalization and profit performance was positive. The above relationship was inconsistent after a firm's rate of internationalization was over 50%.
Kim, Hwang & Burgers (1989)	62 U.S. MNCs for the years 1982-85.	Internationalization was related to high performance and growth rate irrespective of the type of diversification strategy followed.
Geringer, Beamish & daCosta (1989)	181 U.S. and European MNC's for the years 1977-1981.	Internationalization was found to be related to ROS and ROE with an inverted U type relationship after controlling for continent of origin.

Author	Sample	Findings
Collins (1990)	150 U.S. MNCs for the years 1976-1985.	MNCs with international operations in developed countries had a performance that is comparable with that of domestic firms, but firms with international operations in developing countries had lower performance with compared to other firms.
Markides & Ittner (1994)	276 foreign-acquisition announcements by U.S. firms in the years 1975-88.	Stock market returns of U.S. firms during foreign acquisitions varied according to the type of diversification, macroeconomic environment, industry characteristics, and the nature of acquired firm.
Sullivan (1994)	200 U.S. and European MNCs in the year 1981; 74 U.S. MNC's in the year 1991.	Support was found for the earlier finding of Geringer, et. al., (1989), even after correcting for statistical artifacts and using a better measure of internationalization.
Hitt, Hoskission & Kim (1994)	295 U.S. firms for a years 1988-1990.	Internationalization was found to have an inverted U shaped relationship with Performance.
Sambharya (1995)	53 U.S. based MNCs in the year 1985.	No relationship was found between internationalization and performance. However, interaction effects were found between internationalization, diversification and performance.

Appendix 2. Table Showing Listing of Sample Firm's Growth in Internationalization

OBS	NAME	CNUM	GFTA	GFTS	GFTP	GINT
1	ARCHER-DANIELS-MIDLAND CO.	39483	12.47	23.73	5.21	1.81
2	BORDEN, INC.	99599	13.41	12.14	-0.58	1.2775
3	CPC INTERNATIONAL INC.	126149	11.35	0.54	47.5	0.5945
4	CAMPBELL SOUP COMPANY	134429	15.71	7.88	0.25	1.1795
5	GENERAL MILLS, INC.	370334	0.59	0.46	0.3	0.0525
6	HERSHEY FOODS CORP.	427866	14.45	11.48	2.24	1.2965
7	KELLOGG COMPANY	487836	-2.91	5.02	4.88	0.1055
8	PEPSICO, INC.	713448	-6.59	3.29	14.7	-0.165
9	PHILIP MORRIS COMPANIES	718154	10.24	10.06	15.16	1.015
10	QUAKER OATS COMPANY	747402	-12	-4.77	-9.22	-0.8385
11	RALSTON PURINA COMPANY	751277	9.43	5.33	13.89	0.738
12	ABBOTT LABORATORIES	2824	5.17	6.66	9.24	0.5915
13	AIR PRODUCTS AND CHEMICALS	9158	11.25	4.56	-11.33	0.7905
14	AMERICAN HOME PRODUCTS	26609	1.47	0.28	-0.25	0.0875
15	AVON PRODUCTS, INC.	54303	16.78	17.35	35.15	1.7065
16	BRISTOL-MYERS SQUIBB CO.	110122	-1.31	3	-7.63	0.0845
17	CALGON CARBON CORP.	129603	35.15	38	26.29	3.6575
18	COLGATE-PALMOLIVE CO.	194162	8.34	5.28	39.51	0.681
19	CROMPTON & KNOWLES CORP.	227111	-4.19	-5.75	4.57	-0.497
20	THE DEXTER CORPORATION	252165	-8.54	10.55	36.88	0.1005
21	DOW CHEMICAL COMPANY	260543	-0.57	-0.48	-13.53	-0.0525
22	ECOLAB INC.	278865	0.53	-5.12	-20.77	-0.2295
23	ETHYL CORPORATION	297659	-5.6	1.76	-7.47	-0.192
24	FMC CORPORATION	302491	24.53	6.29	-32.92	1.541
25	FERRO CORPORATION	315405	1.62	3.89	-18.22	0.2755
26	THE B.F. GOODRICH CO.	382388	4.91	4.55	-50.04	0.473
27	HERCULES INCORPORATED	427056	-0.84	6.45	11.32	0.2805
28	INTERNATIONAL FLAVORS	459506	-6.04	7.46	5.11	0.071
29	JOHNSON & JOHNSON	478160	5.69	7.15	-8.68	0.642
30	LAWTER INTERNATIONAL, INC	520786	-11.1	8.63	21.91	-0.1235
31	LILLY (ELI) AND COMPANY	532457	-4.91	-4.46	15.63	-0.4685
32	LOCTITE CORPORATION	540137	21.13	17.46	32.86	1.9295
33	LUBRIZOL CORPORATION	549271	-0.31	-6.87	-14.71	-0.359

OBS	NAME	CNUM	GFTA	GFTS	GFTP	GINT
34	MERCK & CO., INC.	589331	-11.5	4.28	-9.67	-0.361
35	MONSANTO COMPANY	611662	14.28	7.3	-2.81	1.079
36	MORTON INTERNATIONAL, INC	619331	23.94	29.59	36.96	2.6765
37	NALCO CHEMICAL COMPANY	629853	19.95	21.1	1.5	2.0525
38	OLIN CORPORATION	680665	-0.2	1.1	-0.17	0.045
39	PPG INDUSTRIES, INCORP.	693506	13.22	13.82	-2.25	1.352
40	PFIZER INC.	717081	-11.9	-7.39	-11.06	-0.9645
41	PROCTER & GAMBLE CO.	742718	23.4	20.07	15	2.1735
42	ROHM & HAAS COMPANY	775371	5.51	13.04	32.88	0.9275
43	SCHERING-PLOUGH CORP.	806605	-5.93	-4.68	-10.14	-0.5305
44	UNION CARBIDE CORP.	905581	-12.9	-5.6	-51.27	-0.925
45	WARNER-LAMBERT COMPANY	934488	6.08	6.66	-56.98	0.637
46	WITCO CORPORATION	977385	7.04	6.86	9.15	0.695
47	BARNES GROUP, INC.	67806	-0.57	-2.97	9	-0.177
48	GILLETTE COMPANY (THE)	375766	9.68	12.67	20.49	1.1175
49	HARSCO CORPORATION	415864	0.91	-2.64	-10.79	-0.0865
50	KEYSTONE INTERNATIONAL	493503	13.96	0.05	-11.76	0.7005
51	PARKER HANNIFIN CORP.	701094	0.17	4.48	-0.27	0.2325
52	RAYTECH CORPORATION	755103	15.31	14.55	-21.84	1.493
53	ROBERTSON-CECO CORP.	770539	-10.7	-0.94	57.53	-0.582
54	SPS TECHNOLOGIES, INC.	784626	-16.3	-5.25	48.62	-1.0775
55	STANLEY WORKS (THE)	854616	2.42	1.97	6.61	0.2195
56	STARRETT L.S. COMPANY	855668	6.71	3.42	-10.59	0.5065
57	TRINOVA CORPORATION	896678	20.31	16.07	785.65	1.819
58	BAKER HUGHES, INC.	57224	10.74	29.39	51.97	2.0065
59	BLACK & DECKER CORP.	91797	0.75	-10.2	16.79	-0.4725
60	BROWN & SHARPE MANU.	115223	34.35	12.31	37.76	2.333
61	BRUNSWICK CORPORATION	117043	-3.61	2	814	-0.0805
62	CATERPILLAR, INC.	149123	5.61	6.06	181.1	0.5835
63	CINCINNATI MILACRON INC.	172172	6.75	1.93	50.16	0.434
64	COMMERCIAL INTERTECH CO.	201709	14.19	18.66	-33.31	1.6425
65	COMPAQ COMPUTER CORP.	204493	29.04	69.11	78.34	4.9075
66	CRAY RESEARCH, INC.	225224	4.52	25.1	71.61	1.481
67	CUMMINS ENGINE COMPANY	231021	13.45	8.86	409.48	1.1155
68	DATA GENERAL CORP.	237688	12.75	18.08	-29.65	1.5415
69	DATAPOINT CORPORATION	238100	49.47	64.26	4.19	5.6865
70	DIGITAL EQUIPMENT CORP.	253849	25.12	24.2	68.03	2.466

OBS	NAME	CNUM	GFTA	GFTS	GFTP	GINT
71	DONALDSON COMPANY, INC.	257651	11.69	7.02	45.44	0.9355
72	DRESSER INDUSTRIES, INC	261597	10.38	21.3	30.12	1.584
73	EMC CORPORATION	268648	24.12	25.96	-31.02	2.504
74	ESTERLINE TECHNOLOGIES	297425	-4.96	0.27	-2.95	-0.2345
75	GLEASON CORPORATION	377339	9.13	15.1	49.77	1.2115
76	GRACO INC.	384109	24.48	2.79	45.88	1.3635
77	HEWLETT-PACKARD COMPANY	428236	22.64	17.95	5.44	2.0295
78	IMO INDUSTRIES, INC.	452540	22.06	25.89	20.7	2.3975
79	INGERSOLL-RAND COMPANY	456866	-27	9.53	21.37	-0.8735
80	INTERNATIONAL BUSINESS	459200	11.85	17.66	182.78	1.4755
81	IONICS, INCORPORATED	462218	36.52	35.47	68.64	3.5995
82	KENNAMETAL INC.	489170	-3.41	0.89	-6.05	-0.126
83	OUTBOARD MARINE CORP.	690020	-1.07	8.08	-11.06	0.3505
84	PALL CORPORATION	696429	15.73	26.55	53.2	2.114
85	PORTEC, INC.	736202	10.04	6.98	-32.55	0.851
86	PREMARK INTERNATIONAL,	740459	28.15	45.15	74	3.665
87	QMS. INC.	74726G	21.66	38.99	92.46	3.0325
88	SPX CORPORATION	784635	10.86	14.73	18.13	1.2795
89	SCOTSMAN INDUSTRIES	809340	44.49	32.62	86.23	3.8555
90	STORAGE TECHNOLOGY CORP.	862111	9.46	25.5	49.2	1.748
91	TANDEM COMPUTERS INC.	875370	7.29	26.44	-41.48	1.6865
92	TEREX CORPORATION	880779	17.96	13.74	4.67	1.585
93	TIMKEN COMPANY (THE)	887389	-2.11	-0.95	2.81	-0.153
94	TOKHEIM CORPORATION	889073	16.78	16.01	-82.64	1.6395
95	TWIN DISC, INCORPORATED	901476	10.89	19.37	142.54	1.513
96	TYCO LABORATORIES, INC.	902120	30.14	24.5	20.42	2.732
97	UNISYS CORPORATION	909214	-4.82	12.4	-170.7	0.379
98	VARCO INTERNATIONAL, IN	922126	24.34	29.57	28.65	2.6955
99	VARIAN ASSOCIATES, INC.	922204	0.87	7.75	19.61	0.431
100	WESTERN DIGITAL CORP.	958102	36.82	40.36	106.18	3.859
101	WESTINGHOUSE ELECTRIC CO.	960402	-5.76	0.85	-89.32	-0.2455
102	ACME CLEVELAND CORP.	4626	12.07	11.81	-16.66	1.194
103	ADVANCED MICRO DEVICES	7903	6.14	12.66	-59.11	0.94
104	ALLEN GROUP INC. (THE)	17634	-22.9	-16.8	-30.32	-1.985
105	AMP INCORPORATED	31897	17.88	21.47	14.28	1.9675
106	ANALOG DEVICES, INC.	32654	3.18	5.66	-4.47	0.442
107	COOPER INDUSTRIES, INC.	216669	16.18	12.14	8.1	1.416

OBS	NAME	CNUM	GFTA	GFTS	GFTP	GINT
108	EATON CORPORATION	278058	-1.06	3.44	39.97	0.119
109	GENERAL DATACOMM INDUS.	369487	4.42	-6.13	-131.1	-0.0855
110	GENERAL ELECTRIC CO.	369604	-12.9	-3.82	-13.33	-0.836
111	GENERAL MOTORS CORP.	370442	-7.09	-1.18	57.87	-0.4135
112	HARMAN INTERNATIONAL INC.	413086	30.37	38.66	370.37	3.4515
113	INTERNATIONAL RECTIFIER	460254	8.45	38.65	-92.02	2.355
114	KOLLMORGEN CORPORATION	500440	15.88	15.27	22.62	1.5575
115	MOTOROLA, INC.	620076	9.45	23.4	45.22	1.6425
116	OAK INDUSTRIES, INC.	671400	-8.38	-4.29	-236.5	-0.6335
117	RAYCHEM CORPORATION	754603	-15.1	7.59	274.47	-0.3755
118	SENSORMATIC ELECTRONICS	817265	9.11	13.19	42.2	1.115
119	TEXAS INSTRUMENTS INC.	882508	13.97	19.14	7.95	1.6555
120	THOMAS & BETTS CORP.	884315	13.47	13.14	16.15	1.3305
121	UNITRODE CORPORATION	913283	26.67	29.61	110.35	2.814
122	VISHAY INTERTECHNOLOGY	928298	16.4	22.46	-20.2	1.943
123	WHIRLPOOL CORPORATION	963320	35.78	37.52	19.39	3.665
124	ZENITH ELECTRONICS CORP.	989349	5.88	-2.39	8.54	0.1745
125	ALLIED-SIGNAL, INC.	19512	11.51	0.73	-116.4	0.612
126	AUGAT INC.	51042	14.7	14.26	618.49	1.448
127	CHRYSLER CORPORATION	171196	-7.18	1.05	62.51	-0.3065
128	DANA CORPORATION	235811	2.53	2.77	-28.07	0.265
129	ECHLIN INC.	278749	24.46	23.97	35.9	2.4215
130	FEDERAL-MOGUL CORP.	313549	33.41	15.65	-2.57	2.453
131	FORD MOTOR COMPANY	345370	-50.6	-15.7	91.27	-3.315
132	HARLEY-DAVIDSON, INC.	412822	6.55	10.58	0.81	0.8565
133	ROCKWELL INTERNATIONAL	774347	-13.8	-10.4	-4.25	-1.21
134	SEQUA CORP.	817320	2.73	7.59	33.13	0.516
135	STANDARD PRODUCTS CO.	853836	15.69	15.96	7.04	1.5825
136	TRW INC.	872649	4.87	8.56	-11.88	0.6715
137	UNITED TECHNOLOGIES CO.	913017	-1.3	16.48	63.63	0.759
138	WHITEHALL CORPORATION	965010	-17.5	-7.85	2.2	-1.2675
139	BARD, (C.R.) INC.	67383	18.76	17.69	45.13	1.8225
140	BAUSCH & LOMB INC.	71707	27.53	16.41	4.06	2.197
141	BAXTER INTERNATIONAL, INC.	71813	-4.37	-4.87	25.74	-0.462
142	BECTON, DICKINSON AND C.	75887	10.15	15.39	-13.64	1.277
143	DANIEL INDUSTRIES, INC.	236235	4.4	8.14	12.63	0.627
144	EASTMAN KODAK COMPANY	277461	0.88	7.33	12.01	0.4105

OBS	NAME	CNUM	GFTA	GFTS	GFTP	GINT
145	EMERSON ELECTRIC CO.	291011	22.33	21.06	14.75	2.1695
146	GENRAD, INC.	372447	62.65	13.08	-23.15	3.7865
147	HONEYWELL INC.	438506	6.47	7.17	-3.15	0.682
148	LITTON INDUSTRIES, INC.	538021	6.88	3.65	0.07	0.5265
149	MEASUREX CORPORATION	583432	-5.88	12.83	-97.02	0.3475
150	MEDTRONIC, INC.	585055	14.26	14.99	23.74	1.4625
151	MILLIPORE CORPORATION	601073	19.23	21.27	15.17	2.025
152	POLAROID CORPORATION	731095	14.03	20.72	-34.08	1.7375
153	RAYTHEON COMPANY	755111	-3.32	-8.77	-4.78	-0.6045
154	SNAP-ON TOOLS CORP.INC.	833034	1.44	4.94	-3.66	0.319
155	TEKTRONIX, INC.	879131	2.55	2.26	20.45	0.2405
156	THERMO ELECTRON CORP.	883556	5.87	10.31	14.8	0.809
157	UNITED STATES SURGICAL	912707	16.54	13.39	32.11	1.4965
158	XEROX CORPORATION	984121	-20.4	0.58	-10.46	-0.991

NOTE: OBS= Observation Number; Name=Company Name; CNUM= Company Number; GFTS=Growth in Foreign Sales Ratio; GFTA=Growth in Foreign Asset Ratio; GFTP=Growth in Foreign Profit Ratio GINT=Growth in Internationalization.

Appendix 3. Table Showing Listing of Sample Firm's Extent of Internationalization in 1982 and 1991

OBS	NAME	Two Digit Industry Code	INT82	INT91	GINT
1	ARCHER-DANIELS-MIDLAND CO	20	0	18.1	18.1
2	BORDEN, INC.	20	19.835	32.61	12.775
3	CPC INTERNATIONAL INC.	20	60.39	66.335	5.945
4	CAMPBELL SOUP COMPANY	20	20.295	32.09	11.795
5	GENERAL MILLS, INC.	20	9.425	9.95	0.525
6	HERSHEY FOODS CORP.	20	0	12.965	12.965
7	KELLOGG COMPANY	20	43.39	44.445	1.055
8	PEPSICO, INC.	20	24.75	23.1	-1.65
9	PHILIP MORRIS COMPANIES	20	21.95	32.1	10.15
10	QUAKER OATS COMPANY	20	38.08	29.685	-8.385
11	RALSTON PURINA COMPANY	20	20.54	27.92	7.38
12	ABBOTT LABORATORIES	28	26.17	32.085	5.915
13	AIR PRODUCTS AND CHEMICALS	28	21.335	29.24	7.905
14	AMERICAN HOME PRODUCTS	28	27.755	28.63	0.875
15	AVON PRODUCTS, INC.	28	35.825	52.89	17.065
16	BRISTOL-MYERS SQUIBB CO.	28	27.405	28.25	0.845
17	CALGON CARBON CORP.	28	0	36.575	36.575
18	COLGATE-PALMOLIVE CO.	28	49.73	56.54	6.81
19	CROMPTON & KNOWLES CORP.	28	22.29	17.32	-4.97
20	DEXTER CORPORATION (THE	28	25.515	26.52	1.005
21	DOW CHEMICAL COMPANY	28	48.38	47.855	-0.525
22	ECOLAB INC.	28	19.63	17.335	-2.295
23	ETHYL CORPORATION	28	14.32	12.4	-1.92
24	FMC CORPORATION	28	14.495	29.905	15.41
25	FERRO CORPORATION	28	51.35	54.105	2.755
26	THE B.F. GOODRICH CO.	28	15.03	19.76	4.73
27	HERCULES INCORPORATED	28	22.93	25.735	2.805
28	INTERNATIONAL FLAVORS	28	59.325	60.035	0.71
29	JOHNSON & JOHNSON	28	41.635	48.055	6.42
30	LAWTER INTERNATIONAL	28	37.89	36.62	-1.235
31	LILLY (ELI) AND COMPANY	28	32.825	28.14	-4.685

OBS	NAME	Two Digit Industry Code	INT82	INT91	GINT
32	LOCTITE CORPORATION	28	43.95	63.245	19.295
33	LUBRIZOL CORPORATION	28	51.61	48.02	-3.59
34	MERCK & CO., INC.	28	43.08	39.445	-3.61
35	MONSANTO COMPANY	28	24.505	35.295	10.79
36	MORTON INTERNATIONAL, INC	28	0	26.765	26.765
37	NALCO CHEMICAL COMPANY	28	22.725	43.25	20.525
38	OLIN CORPORATION	28	8.395	8.845	0.45
39	PPG INDUSTRIES, INCORP.	28	21.53	35.05	13.52
40	PFIZER INC.	28	49.415	39.74	-9.645
41	PROCTER & GAMBLE CO.	28	24.715	46.45	21.735
42	ROHM & HAAS COMPANY	28	32.205	41.48	9.275
43	SCHERING-PLOUGH CORP.	28	39.62	34.315	-5.305
44	UNION CARBIDE CORP.	28	31.67	22.375	-9.25
45	WARNER-LAMBERT COMPANY	28	37.22	43.59	6.37
46	WITCO CORPORATION	28	14.035	20.985	6.95
47	BARNES GROUP, INC.	34	22.16	20.39	-1.77
48	GILLETTE COMPANY (THE)	34	56.735	67.91	11.175
49	HARSCO CORPORATION	34	9.9	9.035	-0.865
50	KEYSTONE INTERNATIONAL	34	41.355	48.36	7.005
51	PARKER HANNIFIN CORP.	34	23.14	25.465	2.325
52	RAYTECH CORPORATION	34	6.28	21.21	14.93
53	ROBERTSON-CECO CORP.	34	38.595	32.735	-5.82
54	SPS TECHNOLOGIES, INC.	34	33.81	23.005	-10.775
55	STANLEY WORKS (THE)	34	29.62	31.815	2.195
56	STARRETT L.S. COMPANY	34	26.67	31.735	5.065
57	TRINOVA CORPORATION	34	23.27	41.46	18.19
58	BAKER HUGHES, INC.	35	24.9	44.965	20.065
59	BLACK & DECKER CORP.	35	57.055	52.285	-4.725
60	BROWN & SHARPE MANU.	35	45.19	68.52	23.33
61	BRUNSWICK CORPORATION	35	12.71	11.905	-0.805
62	CATERPILLAR, INC.	35	17.23	23.065	5.835
63	CINCINNATI MILACRON INC	35	18.68	23.02	4.34
64	COMMERCIAL INTERTECH CO.	35	31.1	47.525	16.425
65	COMPAQ COMPUTER CORP.	35	0	49.075	49.075
66	CRAY RESEARCH, INC.	35	14.205	29.015	14.81

OBS	NAME	Two Digit Industry Code	INT82	INT91	GINT
67	CUMMINS ENGINE COMPANY	35	28.325	39.48	11.155
68	DATA GENERAL CORP.	35	27.975	43.39	15.415
69	DATAPOINT CORPORATION	35	27.84	84.705	56.865
70	DIGITAL EQUIPMENT CORP.	35	31.715	56.375	24.66
71	DONALDSON COMPANY, INC.	35	33.675	43.03	9.355
72	DRESSER INDUSTRIES, INC.	35	22.835	38.675	15.84
73	EMC CORPORATION	35	0	25.04	25.04
74	ESTERLINE TECHNOLOGIES	35	18.54	16.195	-2.345
75	GLEASON CORPORATION	35	10.72	22.835	12.115
76	GRACO INC.	35	18.45	32.085	13.635
77	HEWLETT-PACKARD COMPANY	35	36.725	57.02	20.295
78	IMO INDUSTRIES, INC.	35	0	23.975	23.975
79	INGERSOLL-RAND COMPANY	35	31.68	22.92	-8.735
80	INTERNATIONAL BUSINESS	35	44.015	58.77	14.755
81	IONICS, INCORPORATED	35	0	35.995	35.995
82	KENNAMETAL INC.	35	26.255	24.995	-1.26
83	OUTBOARD MARINE CORP.	35	29.295	32.8	3.505
84	PALL CORPORATION	35	27	48.14	21.14
85	PORTEC, INC.	35	7.915	16.425	8.51
86	PREMARK INTERNATIONAL	35	0	36.65	36.65
87	QMS. INC.	35	0	30.325	30.325
88	SPX CORPORATION	35	5.45	18.245	12.795
89	SCOTSMAN INDUSTRIES, INC	35	0	38.555	38.555
90	STORAGE TECHNOLOGY CORP.	35	11.685	29.165	17.48
91	TANDEM COMPUTERS INC.	35	26.285	43.15	16.865
92	TEREX CORPORATION	35	0	15.85	15.85
93	TIMKEN COMPANY (THE)	35	22.92	21.39	-1.53
94	TOKHEIM CORPORATION	35	18.225	34.62	16.395
95	TWIN DISC, INCORPORATED	35	24.62	39.75	15.13
96	TYCO LABORATORIES, INC.	35	3.755	31.075	27.32
97	UNISYS CORPORATION	35	37.89	41.68	3.79
98	VARCO INTERNATIONAL, INC.	35	0	26.955	26.955
99	VARIAN ASSOCIATES, INC.	35	21.145	25.455	4.31
100	WESTERN DIGITAL CORP.	35	0	38.59	38.59
101	WESTINGHOUSE ELECTRIC	35	10.865	8.41	-2.455

OBS	NAME	Two Digit Industry Code	INT82	INT91	GINT
102	ACME CLEVELAND CORP.	36	6.925	18.865	11.94
103	ADVANCED MICRO DEVICES	36	18.71	28.11	9.4
104	ALLEN GROUP INC. (THE)	36	25.365	5.475	-19.85
105	AMP INCORPORATED	36	36.65	56.325	19.675
106	ANALOG DEVICES, INC.	36	34.72	39.14	4.42
107	COOPER INDUSTRIES, INC.	36	14.235	28.395	14.16
108	EATON CORPORATION	36	24.73	25.92	1.19
109	GENERAL DATACOMM INDUS.	36	21.02	20.165	-0.855
110	GENERAL ELECTRIC CO.	36	21.32	12.96	-8.36
111	GENERAL MOTORS CORP.	36	26.675	22.54	-4.135
112	HARMAN INTERNATIONAL INC.	36	0	34.515	34.515
113	INTERNATIONAL RECTIFIER	36	26.48	50.03	23.55
114	KOLLMORGEN CORPORATION	36	10.445	26.02	15.575
115	MOTOROLA, INC.	36	28.4	44.825	16.425
116	OAK INDUSTRIES, INC.	36	12.385	6.05	-6.335
117	RAYCHEM CORPORATION	36	53.005	49.22	-3.755
118	SENSORMATIC ELECTRONICS	36	17.725	28.875	11.15
119	TEXAS INSTRUMENTS INC.	36	30.705	47.26	16.555
120	THOMAS & BETTS CORP.	36	27.83	41.135	13.305
121	UNITRODE CORPORATION	36	0	28.14	28.14
122	VISHAY INTERTECHNOLOGY	36	28.69	48.12	19.43
123	WHIRLPOOL CORPORATION	36	0	36.65	36.65
124	ZENITH ELECTRONICS CORP	36	9.89	11.635	1.745
125	ALLIED-SIGNAL, INC.	37	18.685	24.805	6.12
126	AUGAT INC.	37	13.115	27.595	14.48
127	CHRYSLER CORPORATION	37	18.19	15.125	-3.065
128	DANA CORPORATION	37	19.67	22.32	2.65
129	ECHLIN INC.	37	8.11	32.325	24.215
130	FEDERAL-MOGUL CORP.	37	15.08	39.61	24.53
131	FORD MOTOR COMPANY	37	60	26.845	-33.15
132	HARLEY-DAVIDSON, INC.	37	0	8.565	8.565
133	ROCKWELL INTERNATIONAL	37	12.155	0.02	-12.1
134	SEQUA CORP.	37	13.985	19.145	5.16
135	STANDARD PRODUCTS CO.	37	22.47	38.295	15.825
136	TRW INC.	37	24.455	31.17	6.715

OBS	NAME	Two Digit Industry Code	INT82	INT91	GINT
137	UNITED TECHNOLOGIES CO.	37	25.825	33.415	7.59
138	WHITEHALL CORPORATION	37	12.705	0	-12.675
139	BARD, (C.R.) INC.	38	8.315	26.54	18.225
140	BAUSCH & LOMB INC.	38	28.04	50.01	21.97
141	BAXTER INTERNATIONAL	38	27.26	22.64	-4.62
142	BECTON, DICKINSON AND C.	38	26.125	38.895	12.77
143	DANIEL INDUSTRIES, INC.	38	7.045	13.315	6.27
144	EASTMAN KODAK COMPANY	38	33.805	37.91	4.105
145	EMERSON ELECTRIC CO.	38	14.335	36.03	21.695
146	GENRAD, INC.	38	24.435	62.3	37.865
147	HONEYWELL INC.	38	26.515	33.335	6.82
148	LITTON INDUSTRIES, INC.	38	16.975	22.24	5.265
149	MEASUREX CORPORATION	38	50.18	53.655	3.475
150	MEDTRONIC, INC.	38	22.5	37.125	14.625
151	MILLIPORE CORPORATION	38	34.83	55.08	20.25
152	POLAROID CORPORATION	38	32.815	50.19	17.375
153	RAYTHEON COMPANY	38	11.835	5.79	-6.045
154	SNAP-ON TOOLS CORP.	38	14.035	17.225	3.19
155	TEKTRONIX, INC.	38	26.13	28.535	2.405
156	THERMO ELECTRON CORP.	38	11.22	19.31	8.09
157	UNITED STATES SURGICAL	38	11.09	26.055	14.965
158	XEROX CORPORATION	38	44.495	34.54	-9.91

NOTE: OBS= Observation Number; Name=Company Name; Industry=2 Digit SIC Industry GINT=Growth in Internationalization; INT91=Internationalization during 1991; INT82=Internationalization during 1982.

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