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INDUSTRY STRUCTURE, STRATEGY, AND PERFORMANCE

*City University of New York* PH.D. 1987

# INDUSTRY STRUCTURE, STRATEGY, AND PERFORMANCE

by

SULEIMAN KHALID OBAIDAT

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## Abstract

INDUSTRY STRUCTURE, STRATEGY AND PERFORMANCE

by

Suleiman Khalid Obaidak

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This is a study of the strategies of 304 U.S. manufacturing companies. All the firms in the sample were contained on Compustat tapes and business level strategy was classified according to Porter's typology consisting of focus, costleadership and differentiation strategy. Information from the Compustat tapes, SEC 10K reports, Dun and Bradstreet's Million Dollar Directory and annual reports was used to classify the strategies. Furthermore, this information was used to identify the businesses of the firms. Moreover, the publications of the Census Bureau were used to calculate the concentration index.

It was hypothesized that firms operating in high concentration and entry barriers would favor the combination strategy (cost-leadership/differentiation) over the other types of strategies-focus, cost and differentiation. The mean return on assets was as expected. Moreover, it was hypothesized that firms which followed any type of strategy would outperform those that are classified as "stuck in the middle". The mean return on assets was as expected, with a significant difference between any type of strategy and "stuck in the middle". It was also hypothesized that the size of the firm would be related to the relative success of strategies. Performance was higher when the size of the firm was large and when the combination strategy (costleadership/differentiation) was adopted.

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To my Wife and Daughters

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# Chapter I

# INTRODUCTION

Numerous investigators have attempted to explain statistically the long run aggregate financial performance of firms using economic, managerial and organizational variables. Several of these studies have had a significant influence on economic theory, management practice and public policy; and all have contributed in one way or another to management or organization theory. Yet, all of these studies are flawed in that each employed a few explanatory variables most interesting to the specific author. As White and Hammermesh (1981) have observed, the complexity of the problem of explaining statistically the financial performance of firms has resulted in a number of largely independent areas of research that have attempted to explain such performance, each from its own perspective.

Researchers in business policy, industrial organization economics, and organization theory have explored determinants of firm performance. Empirical studies in any one of these areas have generally not been able to explain large amounts of variance in performance of firms. Each of these disciplines has its own paradigms, units of analysis, and research methodologies that inhibit cross-fertilization among fields. However, recently theories have been advanced that have attempted to integrate these

disciplines, and these models hold great promise for being able to explain more variance in performance than any previous models. Empirical work needs to be done to substantiate these integrative theories. The model this study is going to test integrates overlapping and common explanatory variables from industrial organization economics, organization theory and business policy, business position, industry environment, strategy, and structure.

1.1 Levels of Strategy

Two distinct levels of strategy can be found in most large companies: corporate strategy and business level strategy. Corporate strategy involves choosing which business to compete in, while business level strategy involves choosing how to compete in each of those businesses (Hofer and Schendel, 1978).

1.2 Strategy Process and Content

A distinction can be made between how strategy is formulated (process) and what strategies are employed (content). Strategy process focuses on the process used to formulate and implement strategy; strategy content deals with the strategies themselves and their implications. The former was the subject of most business strategy research before the 1970's (Aquilar, 1967; Cyert and March, 1963).

1.3 Strategy Content

Studies have shown that the content of a company's strategies

is related to its performance. One of the strongest correlations yet shown has been with the relative market share of a business unit (Buzzell, Gales and Sultan, 1975; Catry and Chevalier, 1974). Investment intensity, product quality, marketing expenditure, and research and development expenditures have also been shown to be related to performance (Schoeffler, Buzzell, and Heany, 1974).

Strategy content research has explored both corporate and business-level strategy. In the area of corporate strategy, Rumelt (1974) looked at corporate diversification patterns and related them to performance of firms. The Boston Consulting group formulated generic strategies for managing business units of a corporate portfolio including build, harvest, and divest (Hedley, 1977).

There are strong theoretical ties between industry structure and performance (Scherer, 1970). Since business level strategy deals with how a firm competes in a particular industry, it fits more naturally into this theoretical framework than does corporate strategy. For diversified firms, the formulation of business level strategy has resulted in the concept of strategic business units (SUBs). Hall (1978) stated that: "The fundamental concept in the identification of (strategic business units) is to identify the discrete independent product market segments served by the firm." In essence, the idea is to decentralize on the basis of strategic elements, not on the basis of size or span of control. Finally,

multibusiness organizations are the most common type of large firms. Rumelt (1974, p. 53) noted that close to 95 percent of Fortune 500 companies can be classified as multibusiness. A model of business unit performance, then, is relevant to a great majority of large industrial firms.

1.4 Study Objectives

The primary goal of this study is to develop a theory of business unit strategy and performance by testing the integrative model which was developed by White and Hammermesh in 1981 and to provide this area with more empirical research. Toward this goal, this study focuses on three broad objectives. (In addition, this study tested a number of relationships suggested by the diverse body of literature.)

The first objective is to assess the relationship between industry structure and strategy. Under what circumstances and industry characteristics can a specific type of strategy be chosen?

The second objective is to assess the relationship between structure and strategy. Under what circumstances does a specific type of strategy fit a specific type of structure. The fit that leads to higher performance?

The third objective is to identify those characteristics particular to a given market and organization structure that affect adopting a specific type of strategy. Under what conditions can the

selection of a specific type of strategy be expected to result in a higher performance?

## 1.5 The Research Question

In the light of the objectives presented above, the general research question is: What is the relationship of business level strategy to performance in industries with high concentration and high entry barriers?

This general question implies the following:

First, to what level is a specific type of industry structure related to performance, and how does it affect the adoption of a specific type of strategy?

Second, what is the impact of organization structure on strategy selection and performance?

Third, given a specific type of industry structure and organization, will the selection of a combination strategy (cost leadership/ differentiation) result in a relatively high performance?

## 1.6 Limitations of the Study

Only manufacturing firms are considered in this study. Therefore, generalizations cannot be made to all types of business. In addition, the operationalization of strategy represents a problem by itself. For a strategy to be accurately described there should be an in-depth knowledge of the firm's environment, its resources, its

goals, its strengths and weaknesses. In depending upon the published data alone, strategy can only be described in very general and subjective terms.

## 1.7 Organization of the Study

Chapter II reviews the relevant literature that pertains to industrial organization economics, organization theory, and business policy.

Chapter III presents the sample, hypotheses, and other aspects of the research design.

Chapter IV presents and discusses the results of the study.

Chapter V summarizes the findings and makes inferences concerning the relationship between the organization environment, strategy, and performance.

# Chapter II

# LITERATURE REVIEW

## 2.1 Industrial Organization

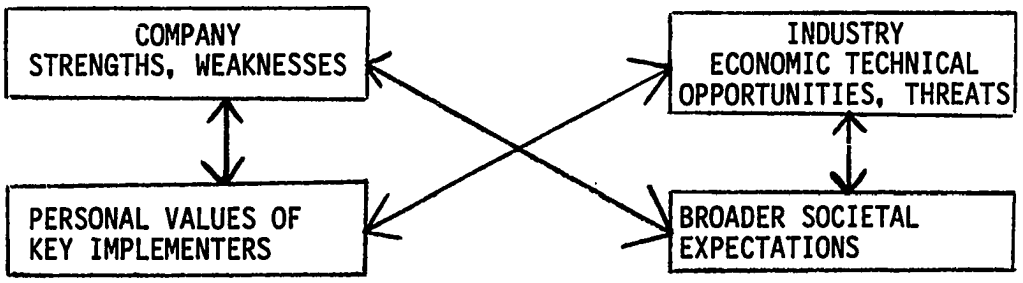
Industrial organization aids in the analysis of strategic choices by firms within industries, and the contribution is growing rapidly as new research breaks down the differences which are related to the purposes, frame of reference, unit of analysis and research values. For example, policy practitioners were interested in improving a firm's performance from a private viewpoint, which meant increasing return on assets (ROA). Industrial organization researchers were motivated to improve performance from a social viewpoint which could mean reducing ROA to the purely competitive level. Policy practitioners have been vitally interested in the problems of the individual company, and viewed each firm as a unique entity with unique strengths and problems. Conversely, the industrial organization theory took the industry as the unit of analysis. Finally, industrial organization had a static perspective — industry structure is stable while policy practitioners are used to having to cope with changes in structure.

The traditional industrial organization paradigm (IOP) has long

held a tantalizing promise for strategy formulation. This is clear when one examines the Learned, Christensen, Andrews, and Guth (LCAG) framework that has become the foundation of business policy (1969; Andrews,1971). Effective strategy formulation from a normative standpoint according to LCAG entailed relating the four long elements shown in the following figure:

Figure 1

The Four Elements of
Effective Strategy Formulation

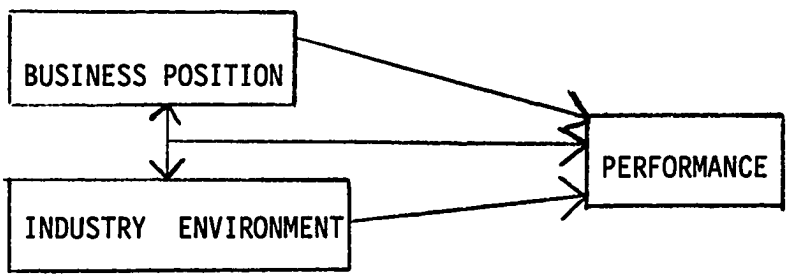



Source: Porter. M., "The contribution of Industrial Organization to Strategic Management", Academy of Management Review, 1981.

The traditional Bain/Mason IOP of the 1950's and 1960's held obvious promise at one level as Figure 2 demonstrates. The essence of the paradigm is that a firm's performance in the marketplace depends critically on the characteristics of the industry environment in which it competes as shown.

Figure 2

Industrial Organization Economics Model




Source: White & Hammermesh, "Toward a Model of Business Unit Performance", Academy of Management Review, 1981.

Industry structure determined the behavior or conduct of firms whose joint conduct then determined the collective performance of the firms in the marketplace (Bain, 1968, Mason, 1953). Industry structure was defined as "the relatively stable economic and technical dimensions of an industry that provide the context in which competition occurred" (Bain, 1972).

Market conduct consists of a firm's policies toward its product market and toward the moves made by competitors. Caves (1977) classified these as: (1) policies toward setting prices, (2) policies towards setting the quality of the product, and (3) policies aimed at coercing rivals. He added that market conduct will differ

according to market conditions. For example, under pure competition where concentration is very low, there is no product differentiation, and entry barriers are insignificant. The individual firm has no significant freedom of choice, the market sets the price for its product, and it cannot meaningfully ask for a different one. In a pure monopoly, the only choice to the monopolist is whether or not to be a profit maximizer. Finally, under oligopoly, firms are few enough to recognize the impact of their actions on their rivals and thus on the market as a whole. Here, the sellers react to one another in mutual interaction.

The Bain/Mason paradigm offers a systematic model for assessing the nature of competition in an industry, industry opportunity and threats. Identifying the structure of the industry in IOP terms casts the spotlight on the crucial aspects of the firm's industry environment, and illuminates such critical concepts as barriers to entry, and demand elasticity.

During the 1970's IOP has been enriched by addressing, at least in a partial way, many of the limitations of the Bain/Mason paradigm. The strategic group/mobility barrier extension of IOP constitutes the beginning of a systematic way to determine what the firm's strengths and weaknesses are. This extension promises to increase the scope of IOP's contribution to strategic analysis by

enabling it to contribute to the analysis of the upper left box in the LCAG framework. In addition, the strategic group/mobility barrier concept is a starting point for the dynamic modeling of industry evolution, in which firms with different strategies and different objectives make investments in improving their strategic position (Porter, 1981).

Caves and Porter (1977) develop a theory of strategic groups to explain the sources and consequences of the long-run existence of such groups within industries. One of the implications of this theory is that the presence of strategic groups indicates that the structure of demand and cost conditions would differ between groups, even though they belong to the same industry. For example, national producers may receive a greater net benefit from their advertising effort because they are able to advertise nationally, or are able to buy advertising at a lower cost than regional producers. The concept of strategic groups is that firms within industries can be clustered according to their strategies, and their reaction to disturbances and the pattern of rivalry will be determined by the configuration of the strategic groups. The difficulty of entry into an industry depends on the strategic position the firm seeks to adopt. The presence of strategic groups within an industry fundamentally affects the expected distribution of the firms' profit rate in two ways:

1. Barriers to entry differ among strategic groups
2. The configuration of strategic groups will determine how competitive rivalry in the industry will be and the degree of rivalry among particular groups (Porter, 1974, 1980; Newman, 1978).

Mobility barriers are deterrents to a shift in strategic position of a firm's stable advantages over others. Thus, mobility barriers provide an explanation of differences in performance by firms in the same industry, and provide a conceptual basis for positioning a firm within its industry (Porter, 1981).

Tremblau (1985) concluded from his study on strategic groups and the demand for beer that: (1) significant differences in the demand for national and regional beer seem to exist; (2) nationals appear to have a marketing advantage over regionals — perhaps because they are large scale advertisers; and (3) advertising and production rivalry from inside, relative to outside, a firm's strategic group can have a more detrimental effect upon the firm's demand. These results support Caves and Porter's theory of strategic group.

Harrigan (1985) argued that strategic group mapping can be a useful way of tracking industry dynamics as firms become more similar to, or different from, each other. The matching of market segment change with strategic group evolutions provides a useful means of

predicting the nature of competition. Such analysis investigates the strategy and operating differences among firms within an industry and by doing so strategic group analysis can be a useful tool which focuses managers' attention upon salient differences in how competitors approach the marketplace. Such analysis is useful because it could help managers to assess (1) the attractiveness of market opportunities for their firm, (2) their abilities to exploit industry changes, and (3) their long-term opportunities for profitability within the industry in question. She added that the value of studying strategic groups and mobility barriers for strategists then is to isolate significant asymmetrics among firms' strategies and performance in order to generate estimates regarding the nature of important mobility barriers. This information can suggest which desirable strategic groups' positions might be most vulnerable to entry.

Finally, Dess and Davis (1984) concluded from their study that variations in interindustry profitability and growth are found to be related to strategic group membership. Firms identified with at least one generic strategy outperformed firms identified as "stuck in the middle".

The Bain view that strategic choices do not have an important influence on industry structure is nearly dead. It is now recognized

that there are feedback effects of firm conduct (strategy) on market structure. Firm innovations can enhance or diminish entry and mobility barriers. Also, past performance affects the strategic options available to firms (Comanor and Wilson, 1974). Other articles have demonstrated how firms can affect or even deter entry into their industries by carefully choosing their strategies (Porter, 1980; Salop, 1979; Schamalensee 1978; Spence, 1979).

Industrial organization researchers have identified an increasingly rich set of elements of industry structure that are important to competitive interaction. Harrigan (1980) studies firms in declining industries and prescribed appropriate strategies. Hambrick and Schecter (1983) proposed turnaround strategies for companies in mature markets. Bloom and Kotler (1975) outlined strategies for high market share companies, while Hammermesh, Anderson and Harris (1978) and Cooper and Woo (1980) suggested means by which low market-share companies could compete. Catry and Chesalier (1974) examined both the product life cycle and market share and proposed appropriate strategies. Moreover, Hammermesh and Sills (1979) suggested means of competing in stagnant industries.

Industry structure is defined by Bain (1972) as the relatively stable economic and technical dimensions of an industry that provide the context in which competition occurred. It is important because

the structure determines the behavior of firms in the industry, and that behavior in turn determines the quality of the industry and performance.

Therefore, if we can uncover reliable links between elements of structure and elements of performance, we can with relative ease and confidence predict the performance of any industry in which we are interested (Caves, 1972).

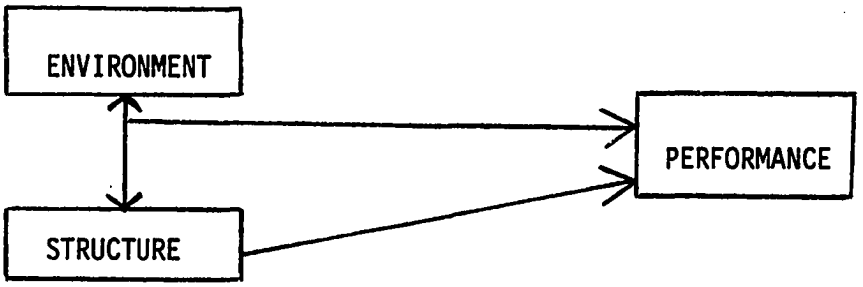
## 2.2 Organization Theory

The predominant line of thought in organization theory has come to be known as contingency theory. It takes the view that organizations are responsive to their environments and that the fit between the environment and the organization structure determines performance (Figure 3). Most organization theorists have described a business environment in terms of uncertainty and variety. Burns and Stalker (1961) found that successful firms in rapidly changing environments tended to favor a more "organic" structure characterized by decentralization, lateral communication, and ambiguous roles. Successful companies in more stable environments tended to demonstrate a more mechanistic form, characterized by a greater centralization and well-defined chains of command. Lawrence and Lorsch (1969), Lorsch and Allen (1973), and Lorsch and Morse (1973) related the fit between environment and structure to performance.

These studies showed that appropriate organization structure is contingent upon characteristics of the environment.

Figure 3

Organization Theory of performance.




Source: White and Hammermesh, "Toward a Model of Business Unit Performance", Academy of Management Review, 1981.

Other researchers have proposed that structure has direct bearings on performance, not contingent upon the environment (Child, 1974). Internal consistency of structure singularly was found to be related to performance (Khandwalla, 1973). Therefore, firm structure is believed to have a direct relationship to performance and also a contingent relationship with environment characteristics to performance.

## 2.3 Business Policy

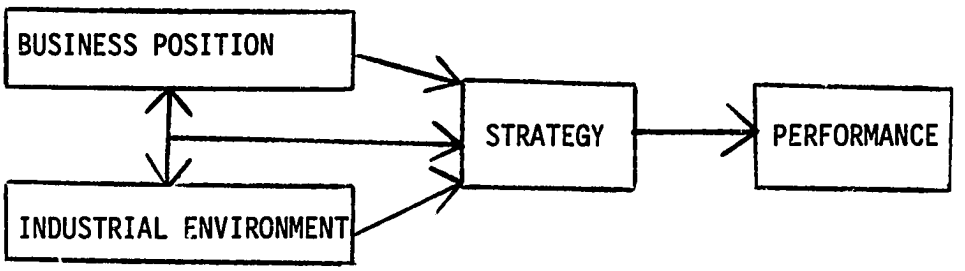
Models of performance developed in industrial organization economics and organization theory are deterministic. An organization

finds itself in a particular set of environmental circumstances. It adapts and survives, or it fails. This view does not consider that organizations are purposive institutions and management is a creative and proactive process. The concept central to this understanding of organizations and management is that of strategy. Andrews (1971) defined strategy as a pattern of objectives, purposes, or goals and the essential policies and plans for achieving those goals, stated in such a way as to define what business the company is in, or is to be in, and what kind of company it is, or is to be. Mintzberg (1978) has proposed that strategy is the pattern in a continuous stream of decisions. The concept of strategy necessitates a modification of the performance models used in industrial organization economics and organization theory.

For industrial organization economics, strategy can be viewed as the way in which a firm chooses to respond to its industry conditions and business position (Figure 4). However, policy theorists believe that factors such as management preferences and values, corporate pressures, and expectations of environmental change can result in different strategies being followed by business units that compete in the same industry environment.

Figure 4

Industrial Organizational Model of Performance Modified to Include Strategy.



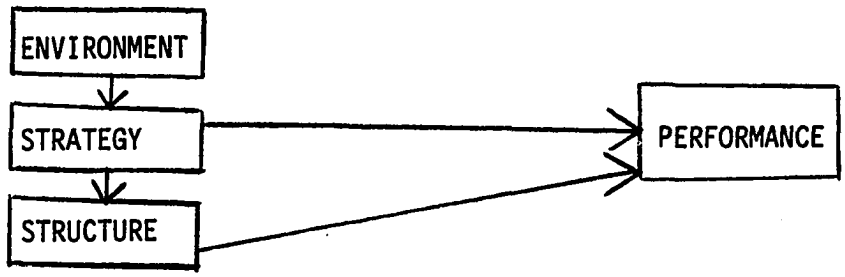

Source: White and Hammermesh, "Toward a Model of Business Unit Performance", Academy of Management Review, 1981.

It is also necessary to amend the organization theorists' model of performance to allow for the suggestion that it is through strategy that the firm interprets its environment and that strategy guides the choice of organization structure (Figure 5). The strategy/structure relationship was first explored by Chandler (1962), and has been the topic of subsequent research (Channon 1971; Rumelt, 1974). This body of research lends considerable support to the hypothesis that structure is influenced by strategy. Nevertheless, most of the empirical business policy research in this area has not considered performance.

Finally Bower's work (1970) suggests that strategic decisions are influenced by the structure surrounding the business unit. Organization both shapes and is shaped by strategy.

Figure 5

Organization Theory Model of Performance Modified to Include Strategy.




Source: White and Hammermesh, "Toward a Model of Business Unit Performance", Academy of Management Review, 1981.

## 2.4 Size and Performance

Hall and Weiss (1967) discussed the relationship between size and performance. One of their conclusions is that large size does tend to result in high profit rates as Baumol proposed, that there is a significant though probably not enormous capital requirements' barrier as a result, and that this barrier very likely has a greater effect on profit rates than concentration, the traditional index of market power. Demsetz (1974) argued that large firms have become

large because they are more efficient than other firms and are able to earn a higher rate of return.

Osborn (1970) stated that in a concentrated industry the average profitability is a function of size differences. That is, large size firms earn higher profits than the smaller ones. In addition to the direct-effect of size on performance, there are indirect effects, through size influence on strategy, structure, and concentration.

Chandler (1966) discussed the size effect on strategy and showed the stages of development of organizations to be size increase first followed by diversification to related and, much later, to unrelated markets. Also, he notes the size-structure relationship as the organizations in his study show increasing tendency towards divisionalization due to size increase, which is the first stage of organization growth. Finally, Ansoff et al, (1971) argued that the acquisition behavior of firms reveals the size effect; in general, the larger the organization, the more its acquisitions.

The previous discussion demonstrates that size has an important influence on performance either directly or indirectly. Thus, size is an important consideration in the study of organization performance.

## 2.5 Concentration

The theory of industrial organization has viewed the industry as a homogeneous unit — firms in an industry are assumed to be alike in all economically important dimensions except for their size (Porter, 1979). In this context, a considerable body of research posits that many industries are characterized by the existence of market power shared among firms. This market power results from the presence of structural barriers to the entry of new competition and from industry concentration.

Studies showed a determinate relationship between concentration ratios and rate of return (Bain, 1976; Mann, 1966; Stigler, 1963). Most studies concluded that a higher concentration ratio permitted an above average rate of return. The more concentrated an industry is, the easier it is for firms to coordinate their policies, (that is, to collude) and successful collusion should lead to higher profit. (Bothwel et al, 1982).

Caves and Porter (1978) argue that industry structure and characteristics have been found to be important determinants of profitability and performance levels. Large businesses appear to be able to realize economies of scale in marketing and R&D expenditures in working capital and plant and equipment utilization, which results in improved performance. Consequently, performance levels are related to the degree of industry concentration.

Osborn (1970) concluded that concentrated industries are more profitable than less concentrated industries. He added that the somewhat greater average profitability was shown on an overall basis for firms in industries with the highest degree of concentration may be primarily, if not entirely, a function of size differences. Moreover, variation is large in the small size group with less than $1,000,000 assets for all manufacturing corporations. For the small firms which have managed to survive in these concentrated industries it is plausible to assume that they act either as suppliers to the big enterprises or deal in service and specialty activities to a greater degree than they compete directly with these giants.

Craig and Douglas (1982) concluded that of all industry structure variables the degree of industry concentration appeared to be the most closely related to performance.

Peltzman (1977) argued that there is a gain from industrial concentration which is represented by higher profits for firms in the concentrated industry. When policy restricts concentration, then it is more likely to reduce efficiency, raise prices, and reduce owner wealth. Jones et al. (1977) concluded from their comparison study of Canadian and American manufacturing industry that there is a significant positive relationship between profits and concentration. Moreover, they concluded that although some of the same structural

variables give rise to differences in performance between two countries (particularly foreign competition), in general the same basic structure-performance model seems appropriate to both economies.

Demstz (1974) argued that if efficiency is associated with concentration, there should be a positive correlation between concentration and the difference between the rate of return earned by large firms and that earned by small firms; that is, large firms have become large because they are more efficient and are able to earn a higher rate of return than other firms. He added that industries with high concentration earned higher rates of return than less concentrated industries. Clark et al, (1984) found from their study that market concentration and industry profitability are positively correlated. Similey (1982) concluded from his study that in an economy in which firms experience "earning by doing", industries which are more concentrated will be more profitable. Gale (1972) found a positive interaction between firm market share and industry concentration -- when concentration was high, market share was strongly correlated with profit; when concentration was low, market share was not strongly correlated with profit. These results are consistent with the theoretical view that collective monopoly power among major competitors is a major source of the profits associated

with market share. Ravenscraft (1983) found, from his study about structure-profit relationships at the line of business and industry level, that there is a positive relationship between concentration and industry's profit. Among the variables he included in his study, he found that the higher capacity utilization has the most important positive effect on performance. Finally, Angelmar (1985) concluded from his study that in industries with high cost and uncertainty of R&D, a high concentration is accompained by a significant increase in research investment. In other words, high concentration appears to be essential to provide adequate incentives for innovation.

Although industry concentration has been identified as a major dimension of industry structure, research on it with respect to strategy has been almost nonexistent.

## 2.6 Barriers to Entry

Stigler (1968) defined barriers to entry as a cost of producing which must be borne by a firm which seeks to enter an industry but is not borne by firms already in the industry. Brooks (1973) defined barriers to entry as the advantages of the established sellers in an industry over potential entrant sellers, these advantages being reflected in the extent to which established sellers can persistently raise their prices above a competitive level without attracting new firms to enter the industry.

Harrigan (1981) argued that the finding from her study would tend to suggest that the structural variables identified by Bain are the more difficult barriers to overcome by firms contemplating entry. The study found that conditions of excess capacity represent a formidable deterrent to entry. Moreover, the study suggests that firms could further barricade their portals by investing in R&D effectively.

Other research endeavors have also been useful, Rhoades (1966) concluded from his study that barriers to entry and concentration together have a significant influence on profit rates. Orr (1973) found (from a study of the determinants of entry on the Canadian manufacturing industries) that barriers to entry permit higher profits, and a given increase in profit rates attracts fewer entrants in a high barrier than a low barrier industry. Moreover, it is found that capital requirements, advertising intensity, and high concentration are significant barriers to entry. In another study (1974), he strongly confirms the Bain and Mann finding that high barrier industries are significantly more profitable than others. And, in particular, among highly concentrated industries those with high barriers are more profitable. Porter (1983) proposed that the desire to gain market share either directly or by acquisition represents a threat to the companies in the industry. He added that

the seriousness of threat of entry depends on the barriers present, and on the reaction from existing competitors that the entrant can expect. If barriers to entry are high and a newcomer can expect sharp retaliation from the entrenched competitors, obviously he will not pose a serious threat.

2.7 Reasons for Barriers to Entry

Bain (1956) and Porter (1980) stated the following reasons for barriers to entry:

1- Absolute cost advantages

2- Economies of scale

3- Product differentiation

4- Capital requirements

1 - Absolute Cost Advantages

Absolute cost advantages are a result of:

a) Superior efficiency. If a firm in an industry is more efficient than an entrant into the industry can expect to be, then this more efficient firm can reap higher profits from the operation than an entrant can hope to obtain on the same amount of capital. The higher income for the more efficient among the incumbent firms can be considered an efficiency rent.

b) Patent rights as cost advantages. The going firm may have

patents granting it exclusive rights to certain product features or processes that enable the established firm to either deny their use by entrants or by paying royalty charges for their use which elevate the entrants' costs (Caves, 1977). Bain (1956) indicated that know-how is extremely important in wallboard production in the Gypsum products industry. He added that established firms generally have various gadgets and technical improvements protected primarily by secrecy. A new firm might be at an appreciable disadvantage for several years before acquiring or developing sufficient know-how. In addition, any new firm would effectively have to pay U.S. Gypsum the nominal royalty of one percent of sales for use of wallboard patents so long as these patents run.

c) Ownership of scarce resources. The firm that owns a monopoly in the sources of supply can gain cost advantages in an industry which uses this resource, as an input, and in which the use of this resource is more favorable than the use of some other input. Thus, if vertical integration between monopoly ownership of the resource and the industry using this resource prevails, we may expect barriers to entry in the industry using the resource. The barrier to entry in the industry here is due to the fact that one firm in the industry is vertically integrated with a different industry in which a monopoly prevails.

2 - Economy of Scale

This refers to declines in unit costs of product (or operation or function that goes into producing a product) as the absolute volume per period increases. Economy of scale deters entry by forcing the entrant to come in at a large scale and risk strong reaction from existing firms, or come in at a small scale and accept a cost disadvantage — both undesirable options.

3 - Product differentiation

This means that established firms have brand identification and customer loyalties which stem from past advertising, customer service, product differences, or simply being first into the industry. Differentiation creates a barrier to entry by forcing entrants to spend heavily to overcome existing customer loyalties.

Product differentiation is perhaps the most important entry barrier (Porter, 1980, Jones et al, 1977; Bain, 1956).

4 - Capital Requirements

The need to invest large financial resources in order to compete creates a barrier to entry, especially if the capital is required for risks, unrecoverable up-front advertising or research and development.

Capital requirements can be estimated by calculating the average assets of the sample of firms for each industry. (Mason and Qualls, 1976).

Finally, Spence (1977) argued that the build up of excess capacity could be used as an entry deterrent, because it may make it rational to use that preexisting capacity after entry in such a way that the entrant faces losses.

Hilke, (1984) argued that firms may rationally invest in excess capacity with the expectation that it will be seen by potential entrants either as a signal of aggressive intent or as a credible threat. He added that when excess capacity does not lead to creation of a credible threat, it may still act as a barrier to entry by shifting the risk -- return perceptions of potential entrants enough to divert the potential entrants' investments into other industries. Moreover, investment in excess capacity will lead to a rise in the entry barriers.

To conclude the above discussion, Bain (1956) found that the high concentration-high barriers have a distinctly higher mean profit than the high concentration-moderate barriers. No such difference was found between the high concentration-moderate barriers and the high concentration-low barriers. Mann (1966) also determined that the very high barriers group was found to have a substantially higher average rate of return than the substantial barriers group. Qualls (1967) concluded that his study provides considerable additional support for Bain's hypothesis relating market performance to concentration and entry barriers. In addition, Caves (1972) argues

that both high concentration and high entry barriers would tend to produce high profit rates: concentration by giving firms a chance to garner some of the potential monopoly profits; entry barriers by allowing short run monopoly profits to be taken without fear of entry. Marten (1979) argues that profits should rise more rapidly with concentration and with higher barriers to entry. He adds that high barriers to entry in the absence of concentration will not allow high profitability since the competition of firms within the industry will yield competitive performance. Almarin (1976) concluded from his study that market concentration may be the cause of high profits, particularly when the entry barriers are also high.

## 2.8 R&D Expenses

The importance of advertising and R&D are reflected in their significant future effects on the market value of the firm, where the market value of the firm represents the future profit stream discounted to the present at an appropriate rate of discount (Hirchey, 1982).

Hirchey (1982) found that advertising and R&D expenditures have positive and significant market value effects. Thomadakis (1977)

found R&D expenditures will also constitute important determinants of firm market value to the extent that such expenditures result in the creation of an economically relevant amount of intangible capital. Grabowski and Mueller (1978) and Stonebraker (1976) found that R&D, like advertising expenditures, is a substantial entry barrier and has a large and consistent positive effect on firm profit rates. Moveover, Connolly and Hirschey (1984) found that R&D has a positive effect on profits. Scherer (1970) suggests that the threat of entry may accelerate the R&D effort by existing firms with respect to new products. Meisel and Lin (1983) found that structural elements such as the level of seller concentration, the level of technological opportunity, the condition of entry, and the degree of product differentiation exert a significant influence on the intensity of business' R&D effort.

2.9 Advertising Expenses

Camanor and Wilson(1967) found that advertising has a statistically significant and quantitatively important impact upon profit rates which provide a measure of market performance as well as indicate the existence of market power. They added that high levels of advertising create additional costs for new entrants. Increasing the advertising effectiveness will create economies of scale and so affect revenues. Moreover, the entrant will suffer an

additional cost disadvantage if he enters at a relatively small scale. However, the need to obtain funds for advertising will give rise to capital requirements over and above those needed for the physical plant and equipment. In addition, Vernon and Nourse (1973) concluded from their study that there is a highly significant relationship between profit rates and advertising to sales ratio. They added that the advertising creates effective entry barriers which in turn cause high profits. Finally, Caves (1977) and Bain (1956) argued that advertising creates entry barriers. They added that high entry barriers allow firms to set prices as much as 10 percent above average cost, while moderate entry barriers allow firms to set prices between 5-8 percent above average cost, and low entry barriers allow firms to set prices no more than 4 percent above average cost.

Duetsch (1982) argued that advertising is anti-competitive because it creates entry barriers which enable established firms to set price above cost.

## 2.10 Operationalization of Strategy

The difficulty in operationalizing strategy represents a factor in slowing down the development of the strategic management field. There are different views relating to the correct methodology of describing strategy. Hambrick (1980) described four general methods

that he had observed being used: textual descriptions, measurement of parts of strategies, multivariate measurements, and typologies.

In textual descriptions, strategy is not measured but rather described. Mintzberg (1977) argued that strategy is too situational to be measured, given its comprehensive, multidimensional nature. Galbreth (1973) performed a qualitative analysis of strategy on a few organizations, describing the process by which strategy was formulated.

Some researchers have concentrated on a single variable in describing strategy and its relationship to performance (Fruhan, 1972; Dalta, 1979). Other researchers employed a multivariate measurement of strategy (Halten, Schendel, and Cooper, 1978; Shueffel, Buzzell, and Heany, 1974).

Typological operationalizations of strategy have advantages over the partial views of strategy because of their comprehensiveness. Miller and Freisen (1977) wrote: "Archetypes appear to represent a set of relationships which are in a temporary state of balance. The administrative situations which are described seem to form a number of gestalts. There is something holistic and ordered about strategy-making behavior."

Typologies attempt to cluster companies into groups which have definite patterns of adapting to the environment and competing with each other. Rumelt (1974) examined the diversification patterns of

several hundred Fortune 500 companies and developed a typology of diversification strategies. The strategies were differentiated along two dimensions (a) proportion of a firm's revenues derived from its largest single business and (b) proportion of a firm's revenues derived from its largest single group of related businesses. The major resulting groupings were single business, dominant business, related business, and unrelated business.

Relating to typological operationalization of business level strategy, Miller and Freisen (1977) employed factor analysis to determine ten archetypes based on descriptions of 81 companies. Each of the strategic types was classified according to the scores of the firms on five key factors: heterogeneity, dynamism, intelligence/rationalization, centralization, and risk-taking temperament. Biggadike (1979) developed a classification scheme which included six categories: price cutter, improved quality, broader or specialist product line, broader or narrower segment, improved services, and distribution innovator. Hofer and Schendel (1978) offered a typology which included six groups also: share increasing strategies, growth strategies, profit strategies, market concentration and asset reduction strategies, liquidation or divestiture strategies, and turnaround strategies. Miles and Snow (1978) developed a strategy typology consisting of four groups: prospectors, defenders, analyzers, and reactors. The primary

dimension along which the strategies were differentiated was the company's rate of product/market change. Prospectors sought out new product/markets, and consistently stimulated new opportunities. Defenders introduced very few new products, competing primarily on the basis of price, delivery, service, or quality. Analyzers comprise an intermediate group between prospects and defenders, and they initiated fewer market/product changes than defenders. If a company attempted ad hoc deviations from any of the above strategies, or never developed strategy along with its internal consistencies, it was termed a reactor.

Other major research in this area has been done by Porter (1980). He described three generic strategies for outperforming other firms in an industry: cost leadership, differentiation, and focus. If a firm competes only in a selected market of an industry, it is considered a focus strategy. Companies which competed on an industry-wide basis could be classified as either cost-leaders or differentiated firms. Cost leaders were characterized by a concentration on reducing production costs, while differentiated firms emphasized making their products better or different from others in the industry. Finally, firms which did not develop strategy in one of the directions mentioned were classified as being "stuck in the middle", which Porter described as a very poor strategic position.

For the purpose of this study, Porter's proposed typology will be adopted because it is the most concise and comprehensive typology and it has also captured the most attention. His first strategy group, cost leadership, concentrates on lowering costs relative to competitors, though not ignoring quality and service. It can be accomplished through experience curve effects, construction of efficient-scale facilities, overhead control, and cost minimization in such areas as R&D, advertising, and service. This strategy often requires a high relative market share.

Differentiation is a strategy of creating something that is perceived as being unique industry-wide -- "a strategy whose goal is to provide a product or service which is perceived to be unique industry wide". Approaches to differentiating may fall along several dimensions: design or brand image, technology, features, or dealer network. This strategy involves a commitment to extensive product research and design, high quality materials, highly skilled labor, or intensive customer support. Focus strategy is a strategy which centers on servicing particular target markets very well, thus differentiating the firm by better meeting that market's needs, or lowering costs in serving, or both.

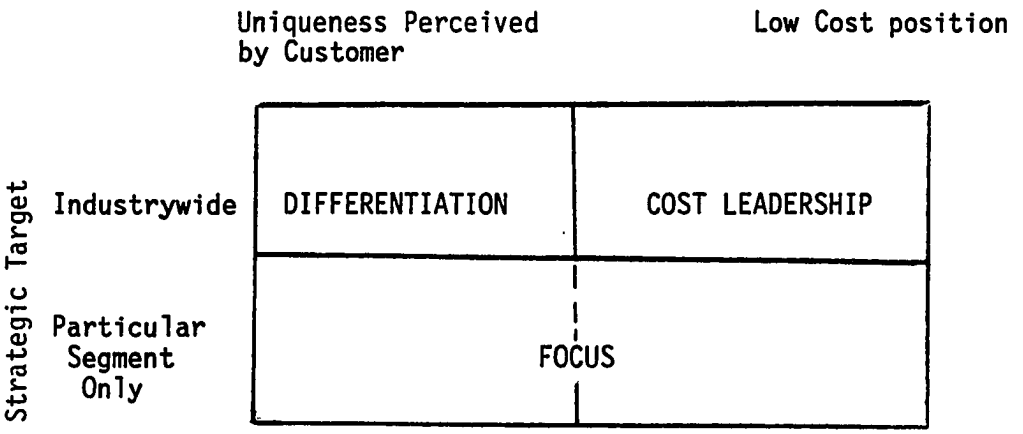
Porter (1980, pp.41-42) stated that if a company does not choose one of these strategies, it would be "stuck in the middle" and would be in an extremely poor strategic position.

The figure below shows Porter's strategy typology.

Figure 6

Porter's Strategy Typology

Strategic Advantage




Source: Porter, M.E., Competitive Strategy, The Free Press, 1980.

Firms will be classified as being "stuck in the middle" and earn the title through one of the following two means:

1- If a company had a product line whose breadth was in between the observed clusters of the broad and narrow product lines, and if the company was not differentiated.

2- If a company had a broad product line and not differentiated, and its sales were relatively low.

Finally, firms which have a combination of strong cost leadership and differentiation characteristics will be classified in the category of cost leadership/differentiation.

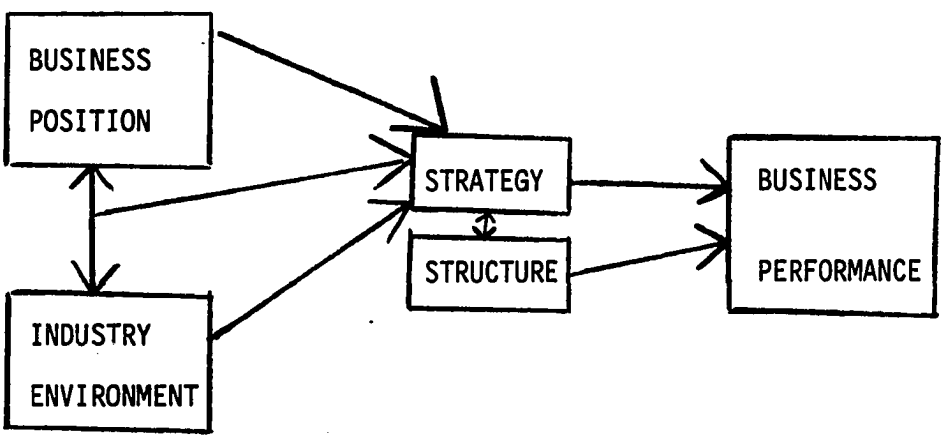
2.11 Need for Current Research: The Use of An Integrative Model.

The research question is: what is the relationship of business level strategy to performance in industries with different levels of concentration and entry barriers? This study will test the integrative model which was developed by White and Hammermesh in 1981 with the objective of developing a theory or at least providing this area with more empirical research.

The White and Hammermesh (1981) model shown in the following figure links research to business performance done in industrial organization economics, organization theory, and business policy.

Figure 7

The Integrative Model




Source: White and Hammermesh, "Toward a Model of Business Unit Performance: An Integrative Model Approach", Academy of Management Review, 1981.

The major feature of the integrative model is that it connects, in a single framework, the concept of industry environment and business position with the organization structure and strategy.

The model postulates that performance is dependent on all these factors, some independently and others in concert. Performance is directly affected by the business strategy. The strategy then influences the design of organization structure, but at the same time structure can constrain and guide the choice of strategy. The fit between the strategy and structure also affects performance, as does the internal consistency of the structural elements. From industrial organization economics comes the idea of assessing industry attractiveness, business strengths and weaknesses. Organization theory draws the attention to organization structure and environment. Business policy provides the essential concept of strategy as the proactive mediation of industry and competitive factors and organizational potential.

To date, the theoretical development of these concepts and the empirical testing of their relationship to performance have proceeded largely independently of one another. As a result, fairly rich theory and a considerable body of empiri al research already independently link these concepts to perfc mance. However, the strong links and overlaps between the independent variables used by

the different schools of thought have gone largely unstated. For example, the organization theorists, who explain performance in terms of environmental conditions and organization structure, do not consider the substantial body of research on environmental factors undertaken in industrial organization economics. Similarly, business policy considers strategy and structure variables but do not look to organization theory to expand its concepts and understanding of structure. The opportunities to link the three lines of research, then, are considerable.

An attractive feature of the integrative model is that it offers more powerful explanations of business performance than any of the other models taken separately simply because it is more fully specified.

With regard to the integrative model, it is interesting to note that researchers in each of the three fields have begun to combine research efforts. As examples, Williamson (1970, 1975) has focused the attention of economists on organizational characteristics. The concept of strategic groups and mobility barriers developed by Porter (1979) has fruitfully brought together ideas from business policy and industrial organization economics. Nevertheless, these and other works concentrate on only two of the three identified fields. The integrative model has the unique feature of encompassing all three fields.

# Chapter III

# THE RESEARCH DESIGN

## 3.1 The Sample

The sample of this study, as Table 1 shows, contains 304 U.S. manufacturing companies with the exclusion of foreign based companies. These companies represent those that have "complete" financial data and have published concentration ratios.

The SIC for these companies ranged between $\geq$ 2000 and < 4000. Moreover, these companies are distributed over 57 U.S. industries as Table 2 shows. The reasons for only considering manufacturing companies are many. First, the data for the manfacturing companies are readily available. Second, the breakdown of the companies according to types of business for the purpose of classification is much easier in comparison to the non-manufacturing companies. Moreover, the manufacturing companies are more important than the non-manufacturing companies in terms of annual sales volume and contribution to the gross national product. Furthermore, manufacturing companies are more concentrated geographically than the non-manufacturing companies. (Ten states -- California, Illinois, Texas, Ohio, Pennsylvania, Michigan, New York, New Jersey, Indiana,

and North Carolina — accounted for 57 percent of total U.S. shipments in 1982 (Richman, 1985)) and the existence of a similar environment will facilitate the comparison between them. This is consistent with the industrial organization economic assumption of the homogeneity between the companies in the industry.

Compustat tapes were used to provide data for the 304 firms in the sample. Compustat provides financial, statistical and market information for approximately 2500 companies whose stocks were traded on the New York and American Stock Exchanges for a 20 year period. Compustat represents the largest available computerized data base of financial information on U.S. manufacturing firms available, and thus was chosen as the population frame for this study. Two files containing the primary industrial file and over the counter file were used. Moveover, additional data were collected from the annual report, 10k, and Dun and Bradstreet's Million Dollar Directory. These descriptive data were used to identify the business of each of the 304 firms in the sample, and to infer the organization structure for those firms. In addition it aided in strategy classification. Furthermore, the publications of the Bureau of Census were used to obtain the concentration ratios for the industries that the 304 firms operated in. All the data with the exception of the concentration ratios are for 1984.

Table 1

Firms in the Sample

| S. No. | Name of the Firm |
|---|---|
| 1. | Abbott Laboratories |
| 2. | Acme - Cleveland Corp. |
| 3. | Allegheny Interntional Inc. |
| 4. | Allis - Chalmers Corp. |
| 5. | Altos Computer Inc. |
| 6. | American Can Co. |
| 7. | American Cyanamid Co. |
| 8. | American Host & Derrick Co. |
| 9. | American Motors Corp |
| 10. | Ameron Inc. |
| 11. | Ampco - Pittsburgh Corp |
| 12. | Anadite Inc |
| 13. | Anchor Hocking Corp |
| 14. | Anderson Clayton & Co |
| 15. | Anheuser - Busch Cos Inc |
| 16. | Apollo Computer Inc |
| 17. | Apple Computer Inc |
| 18. | Armco Inc |
| 19. | Artra Group Inc |
| 20. | Arundel Corp |
| 21. | Avon Products |
| 22. | Avondale Mills |
| 23. | Baker International Corp |
| 24. | Ball Corp |
| 25. | Banctec Inc. |
| 26. | Bandag Inc. |
| 27. | Barber - Breen Co. |
| 28. | Barry (R.G.) |
| 29. | Becor Western Inc. |
| 30. | Belding Heminway |
| 31. | Bell & Howell Co. |
| 32. | BIC Corp. |
| 33. | Biocraft Laboratories |
| 34. | Black & Decker Corp. |
| 35. | Boeing Co. |
| 36. | Borg - Warner Corp. |
| 37. | Bristol - Myers Co. |
| 38. | Bundy Corp. |

| S. No. | Name of the companies |
|---|---|
| 39. | Burlington Industries Inc. |
| 40. | Butler National Corp |
| 41. | Caglegs INC-CLA |
| 42. | Camco Inc. |
| 43. | Cameron Iron Works |
| 44. | Campbell Soup Co. |
| 45. | Carlisle Corp. |
| 46. | Carpenter Technology |
| 47. | Carter - Wallace Inc. |
| 48. | Celanese Corp. |
| 49. | Checkpoint Systems Inc. |
| 50. | Cheseborough - Pond's Inc. |
| 51. | Chrysler Corp. |
| 52. | Church & Dwight Inc. |
| 53. | Cincinnati Milacron Inc. |
| 54. | Clark Equipment Co. |
| 55. | Clark ( J.L.) Manufacturing Co. |
| 56. | ClevPak Corp. |
| 57. | Clorox Co. |
| 58. | CMI Corp |
| 59. | CMX Corp |
| 60. | Colgate - Palmolive Co. |
| 61. | Collins & Aikman Corp |
| 62. | Colt Industries Inc. |
| 63. | Commercial Shearing Inc. |
| 64. | Commodor International LTD. |
| 65. | ComPaq Computer Corp. |
| 66. | ComPuCorp |
| 67. | Compugraphic Corp. |
| 68. | Concrete Gypsum & Plaster |
| 69. | Conner Corp |
| 70. | Conrac Corp |
| 71. | Control Data Corp. |
| 72. | Cooper Tire & Rubber |
| 73. | Coors (Adolph) Co. CLB |
| 74. | Cordis Corp |
| 75. | Cradoock - Terry Shoe Corp. |
| 76. | Craig Corp |
| 77. | Cross (A.T.) & Co. CLA |
| 78. | Cross & Trecker Corp |
| 79. | Crown Crafts Inc. |

| S. No. | Name of the Firm |
|---|---|
| 80. | Dana Corp. |
| 81. | Data Card Corp. |
| 82. | Data General Corp. |
| 83. | Dayco Corp. |
| 84. | Deer & Co. |
| 85. | Del Laboratories Inc. |
| 86. | DeRose Industries |
| 87. | Designatronics Inc. |
| 88. | Digital Equipment |
| 89. | Dinner Bell Foods Inc. |
| 90. | Donaldson Co. Inc. |
| 91. | Doughtie's Foods Inc. |
| 92. | Dover Corp. |
| 93. | Dow Chemical |
| 94. | Dresser Industries Inc. |
| 95. | DuPont (E.I.) De Nemours |
| 96. | Duriron Co. Inc. |
| 97. | DWG Corp. |
| 98. | DynasCan Corp. |
| 99. | Dyneer Corp. |
| 100. | EAC Industries |
| 101. | Eagel - Picher Industries |
| 102. | Eastman Kodak Co. |
| 103. | Eastern Co. |
| 104. | Echlin Inc. |
| 105. | Economics Laboratories Inc. |
| 106. | Eloon Industries |
| 107. | Emerson Electric Co. |
| 108. | Ethyl Corp. |
| 109. | Ex - Cell - O Corp. |
| 110. | Exxon Corp. |
| 111. | Facet Enterprises |
| 112. | Farmer Bros Co. |
| 113. | Farr Co. |
| 114. | Fatrchild Industries Inc. |
| 115. | Federal Screw Works |
| 116. | Federal Signal Corp. |
| 117. | Fibronics International Inc. |
| 118. | Firestone Tire & Rubber Co. |
| 119. | Florida Steel Corp. |
| 120. | Fonar Corp. |

| S. No. | Name of the Firm |
|---|---|
| 121. | Ford Motor Co. |
| 122. | Friedman Industries |
| 123. | Fuller (H.B.) Co. |
| 124. | Gates Learjet Corp. |
| 125. | General Automation |
| 126. | General Building Corp. |
| 127. | General Dynamics Corp. |
| 128. | General Electric |
| 129. | General Mills Inc. |
| 130. | General Motors Corp. |
| 131. | General Refractories Co. |
| 132. | Genex Corp. |
| 133. | Genstar Corp. |
| 134. | Gillette Co. |
| 135. | Gleason Corp. |
| 136. | Golden Enterprises |
| 137. | Goodrich (B.F.) Co. |
| 138. | Goodyear Tire & Rubber Co. |
| 139. | Graco Inc. |
| 140. | Grumman Corp. |
| 141. | Guardian Packaging Corp. |
| 142. | Harnischfeger Corp. |
| 143. | Health - Chem Corp. |
| 144. | Health - mor Inc. |
| 145. | Helen Curtis Industries |
| 146. | Hercules Inc. |
| 147. | Hershey Foods Corp. |
| 148. | Hesston Corp. |
| 149. | Hewlett - Packard Co. |
| 150. | Hexcell Corp. |
| 151. | Hillenbrand Industries |
| 152. | Honeywell Inc. |
| 153. | Horizons Research Inc. |
| 154. | Hormel (GEO. a.) & Co. |
| 155. | Hughes Tools Co. |
| 156. | Hunt MFG. |
| 157. | Imperial Oil LTD - CLA |
| 158. | Interco Inc. |
| 159. | Interlake Inc. |
| 160. | Intermedics Inc. |
| 161. | International Business Machines Corp. |

| S. No. | Name of the Firm |
|---|---|
| 162. | International Flavors & Fragrances |
| 163. | International Minerals & Chemical |
| 164. | ITT Corp. |
| 165. | Johnson & Johnson |
| 166. | Johnson Products |
| 167. | Joy Manufacturing Co. |
| 168. | Kaiser Cement Corp. |
| 169. | Kellog Co. |
| 170. | Kennametal Inc. |
| 171. | Kerr - Mcgee Corp. |
| 172. | Key Pharmaceuticals Inc. |
| 173. | Keystone Camera Products |
| 174. | Kiddle Inc. |
| 175. | Knogo Corp. |
| 176. | Koppers Co. |
| 177. | Koss Corp. |
| 178. | Laclede Steel Co. |
| 179. | LaFarge Corp. |
| 180. | Lamaur Inc. |
| 181. | Lamson & Sessions Co. |
| 182. | Lancaster Colony Corp. |
| 183. | Laresen Co. |
| 184. | Lee Pharmaceuticals |
| 185. | Lilly (ELT) & Co. |
| 186. | Liquid Air Corp. |
| 187. | Litton Industries Inc. |
| 188. | Lodge & Shipley Co. |
| 189. | Lynch Communication System |
| 190. | Macdermid Inc. |
| 191. | Magic Chef Inc. |
| 192. | Mangood Corp. |
| 193. | Manville Corp. |
| 194. | Matrix Corp - NJ |
| 195. | Maul Land & Pineapple Co. |
| 196. | Maccormick & Co. |
| 197. | McDonell Douglas Corp. |
| 198. | Milton Roy Co. |
| 199. | Minnesota Minning & Manufacturing Co. |
| 200. | Murray Ohio Manufacturing Co. |
| 201. | Napco Security Systems Inc. |

| S. No. | Name of the Firm |
|---|---|
| 202. | National Homes Corp. |
| 203. | National Intergroup Inc. |
| 204. | National Presto Industries Inc. |
| 205. | National - Standard Co. |
| 206. | Nature's Bounty INC. |
| 207. | Navistar International |
| 208. | NCR Corp. |
| 209. | Nike INC - CLB |
| 210. | North American Phillips Corp. |
| 211. | Nothern Telecon LTD. |
| 212. | Northwest Engineering Co. |
| 213. | Northwestern STS Port Cement |
| 214. | Northwestern Steel & Wire Co. |
| 215. | Norton Co. |
| 216. | Noxell Corp - CLB |
| 217. | Ohio Ferro - Alloys |
| 218. | Oilgear Co. |
| 219. | Owens - Corning Fiberglass Corp. |
| 220. | Owens - Illinois Inc. |
| 221. | Paccar Inc. |
| 222. | Penn Virginia Corp. |
| 223. | Pennwalt Corp. |
| 224. | Pentron Industries |
| 225. | Petrolite Corp. |
| 226. | Phillips NV - NY Shares |
| 227. | Photo Control Corp. |
| 228. | Pillsbury Co. |
| 229. | Pitney - Bowes Inc. |
| 230. | Pittway Corp. |
| 231. | Polaroid Corp. |
| 232. | Portec Inc. |
| 233. | Procter & Gamble Co. |
| 234. | Proler International Corp. |
| 235. | Puerto Rican Cement Co. Inc. |
| 236. | Quaker State Oil Refining |
| 237. | Quixote Corp. |
| 238. | Raymark Corp. |
| 239. | Reece Corp. |
| 240. | Reid Rowell |
| 241. | Rexnord Inc. |
| 242. | Rockaway Corp. |

| S. No. | Name of the Firm |
|---|---|
| 243. | Roper Corp. |
| 244. | Rubbermaid Inc. |
| 245. | Schulman (A) Inc. |
| 246. | Sensormatic Electronics |
| 247. | Servotronics Inc. |
| 248. | Simpson Industries |
| 249. | Smith International Inc. |
| 250. | Smithfield Foods Inc. |
| 251. | Snap - On Tools Corp. |
| 252. | Southeastern Public SVC CO. |
| 253. | Spectrum Group Inc. |
| 254. | Speed - O - Print Business Machines |
| 255. | Standard Havens Inc. |
| 256. | Standard Products Co. |
| 257. | Stanley Works |
| 258. | Starrett (L.S.) Co. |
| 259. | Sterling Drug Inc. |
| 260. | Stevens (J.P.) & Co. |
| 261. | Stratus Computer Co. |
| 262. | Skyes Dataronics Inc. |
| 263. | Taylor Devices Inc. |
| 264. | Techamerica Group Inc. |
| 265. | Teleconcepts Corp. |
| 266. | Tellabs Inc. |
| 267. | Tenny Engineering Inc. |
| 268. | Tesdata Systems Corp. |
| 269. | Texfi Industries |
| 270. | Textron Inc. |
| 271. | Thetford Corp. |
| 272. | Tootsie Roll Industries Inc. |
| 273. | Toro Co. |
| 274. | Tractor Inc. |
| 275. | Triad Systems Corp. |
| 276. | Twin Disc Inc. |
| 277. | Union Carbide Corp. |
| 278. | United Foods Inc - CLA |
| 279. | United Merchants & Manufacture's Inc. |
| 280. | Universal Security Instrument |
| 281. | USG Corp. |
| 282. | Varco International |

| S. No. | Name of the Firm |
|---|---|
| 283. | Vermont American - LA |
| 284. | Vertiple Inc. |
| 285. | Vicon Industries Inc. |
| 286. | Visual Graphics |
| 287. | Wang Laboratories |
| 288. | Wean United Inc. |
| 289. | Webcor Electronics Inc. |
| 290. | Wedco Technology Inc. |
| 291. | Welded Tube of America |
| 292. | Wells American Corp. |
| 293. | West Co. Inc. |
| 294. | Westighouse Electric Corp. |
| 295. | White Consolidated Industries Inc. |
| 296. | Whitehall Corp. |
| 297. | Whirlpool Corp. |
| 298. | Wright (William E.) Co. |
| 299. | Wrigley (WM) JR Co. |
| 300. | Wolverine World Wide |
| 301. | Xerox Corp. |
| 302. | Zenith Electronics Corp. |
| 303. | Zenith Laboratories Inc. |
| 304. | Zero Corp. |

Table 2

Industries in the Study

| Industry | Number of Companies |
|---|---|
| Food & Kindred Products | 5 |
| Meat Products | 5 |
| Canned - Preserved Fruits-Vegs | 3 |
| Candy & Other Confectionery | 3 |
| Malt Beverages | 2 |
| Food Preparations | 3 |
| Textile Mill Products | 13 |
| Apparel & Other Finished PDS | 1 |
| Wood Buildings-Mobile Homes | 3 |
| Convert Paper-Paperbd PD | 1 |
| Chemicals & Allied Prods | 6 |
| INDL Inorganic Chemicals | 2 |
| Plastic Mufr. & Synthetic Regin | 2 |
| Pharmaceutical Preparations | 11 |
| Soup & Other Detergents | 4 |
| Industrial Organic Chemical | 2 |
| MISC Chemical Products | 4 |
| Petroleum Refining | 4 |
| Rubber & MISC Plactics Prods. | 8 |

Table 2 (continued)

| Industry | Number of Companies |
|---|---|
| Fabricated Rubber Prods. | 1 |
| MISC Plastic Products | 6 |
| Footwear except Rubber | 3 |
| Glass Containers | 3 |
| Cement Hydraulic | 4 |
| Concrete Gypsum & Plaster | 4 |
| Abrasive Asbestos & MISC Min | 5 |
| Plast Furnaces & Steel Works | 11 |
| Metal Cans & Shipping Conco. | 3 |
| Bolts-Nuts-Screws-RIV-Washers | 1 |
| Metal Forgings & Stampings | 7 |
| Fabricated Metal Prods | 2 |
| Farms & Garden Machinery & EQ. | 5 |
| Construction MIN. Mat. Handl. Mach.& EQ. | 7 |
| Construction Machinery & EQ. | 7 |
| Oil Field Machinery & EQ. | 6 |
| Indl. Trucks, Tractors, Trailers | 1 |
| General Industrial Mach. & EQ. | 13 |
| Office Computing & Acctg. Mach. | 6 |
| Elec. & Electr. Mach EQ. & Supp. | 8 |

Table 2 (continued)

| Industry | Number of Companies |
|---|---|
| Radio-TV Receiving Sets | 3 |
| Tele & Telegraph Apparatus | 7 |
| Alarm & Signaling Products | 9 |
| Electronic Computing EQ. | 7 |
| Computer-MINI & MICRO | 10 |
| Office Automation Systems | 4 |
| X-Ray Electronical Apparatus | 3 |
| Motor Vehicles & Car Bodies | 6 |
| Motor Vehicle Parts-Acessor. | 11 |
| Aircraft | 8 |
| Photographic EQ. & Supp. | 12 |
| Pens - Pencils & Other Office Mat. | 2 |
| MISC. Manufacturing Industries | 2 |
| Perfumes Cosmetics Toilet Preparation | 10 |
| Agriculture Chemicals | 2 |
| Hardware | 8 |
| Metal Working Machinery & EQ. | 8 |
| Household Appliances | 7 |

## 3.2 Variables of the Study

This study focuses on the relationship of performance to industry structure, organization structure, and strategy.

The Dependent Variable:

Performance is the dependent variable, and measured by Return on Assets (ROA).

$$ROA = \frac{\text{Net Profit After Taxes}}{\text{Total Tangible Assets}}$$

Return on Assets (ROA) has consistently been the primary performance measure used in strategy content research (Hambrick, 1984; Hatten et al., 1978; Schoeffler et al., 1973).

The Independent Variables

The independent variables consist of strategy, concentration, size, organization structure and entry barriers.

1- The Strategy. The strategy groups are: focus, cost, differentiation, stuck in the middle, and costleadership/-differentiation.

a) Focus strategy

Listed below are the variables which will be used, and the values indicated are those which we expect for the focus strategy.

| | |
|---|---|
| 1- Product breadth | low |
| 2- Geographical coverage | low |
| 3- Sales | low |
| 4- Assets | low |

It is a focused strategy if a firm competed in a relatively small portion of the total market or total geographical market, say < 25 percent of the total market.

b) Cost leadership

The following are the variables which will be used, and the values following the variables are those which we expect for the cost leadership strategy.

| | |
|---|---|
| - Sales | high |
| - Assets | high |
| - Fixed assets/total assets | high |
| - R&D/Sales | low |
| - Marketing/Sales | low |

c) A Differentiation Strategy

A differentiation strategy assigned to those companies demonstrating values in the opposite direction of those shown above and as follows:

| | |
|---|---|
| Sales | low |
| Assets | low |
| Fixed assets/total assets | low |
| R&D/Sales | high |
| Marketing/Sales | high |

d) Stuck in the Middle

Porter stated that a company that failed to develop its strategy in any of the directions discussed before would be classified as stuck in the middle, which means that the firm is in an extremely poor strategic situation. According to Porter, "This firm lacks the market share, capital investment, and resolve to play the low-cost game, the industry-wide differentiation necessary to obviate the need for a low-cost position, or the focus to create differentiation of a low-cost position in a more limited sphere." 1980, p.41).

Based on that, firms will be classified as being stuck in the middle if:

1. A company had a product line whose breadth was in between the observed clusters of the broad and narrow product lines, and if the company is not differentiated.

2. If a company had a broad product line and not differentiated, and its sales were relatively low.

e) Costleadership/Differentiation Strategy

| | |
|---|---|
| Sales | high |
| Assets | high |
| Fixed assets/total assets | high |
| R&D/Sales | high |
| Marketing/sales | high |

Firms which have a combination of strong cost leadership and differentiation characteristics will be classified in the category of cost leadership/differentiation strategy.

Strategy Classification

The strategy can only be inferred from a subjective assessment of many variables. Assig ning a strategy type based upon the values of the above variables will give inaccurate results. This is because some variables are more important in assigning strategy than others, depending upon the industry situation. For example, some firms have spent nothing on research and development, others do not spend on advertising, and, finally, other firms do not spend on either research and development or advertising.

In making the assessment of whether a company competed on an industry wide basis or not, product line and geographic coverage was noted for all firms. If a firm competed in a relatively small portion of the market, it was considered a focus strategy follower.

Firms which did not fit into either a narrow or wide product line were initially classified as stuck in the middle. The second criteria used for the assignment were the values of the variables (sales, assets, fixed assets to total assets, advertising to sales ratio and R&D to sales ratio). Firms that have lower level of sales and assets were classified as following a focus strategy. For the assessment of whether firms followed cost leadership, differentiation, cost/differentiation strategy, or were stuck in the middle, the values of five variables (sales, assets, fixed assets/hotel-assets, advertising/sales, and R&D/sales) were analyzed. A cost leadership strategy was assigned to those companies that had high sales, assets, fixed assets/total assets, low relative advertising/sales and R&D/sales. A differentiation strategy was assigned to those companies that had low sales, assets, fixed assets/total assets and high advertising/sales and R&D/sales, ratio.

Company information other than the financial data was also considered in determining which companies followed a differentiation strategy. Companies having a portion of their sales from overseas were classified as following a differentiation strategy. In addition, the advertising to sales ratio was examined. The higher the ratio the more the companies were differentiated.

Some companies displayed strong characteristics of both cost leadership and differentiation strategy. Those firms have high sales, assets, fixed assets to total assets, advertising to sales and R&D to sales ratio. In other cases, companies which met four out of these five criteria were classified as following costleadership/differentiation strategies.

Finally, descriptive data collected from the 10k annual reports and Dun and Bradstreet's Million Dollar Directory about the company businesses were examined.

Examples of Strategy Operationalization:

If we take as an example industry 3560 (General Industrial Machinery and Equipment) which contains 13 companies, we notice that these companies have been assigned different strategies.

Ampaco - Pittsburgh Corporation was classified as following a cost leadership strategy because of its broad product lines, its relatively high sales, total assets, fixed to total assets, and it reported no advertising and R&D expenses. On the other hand, Clevepak Corporation, Milton Royco, and Twin Disc Inc. were classified as being stuck in the middle. Their product lines are medium in comparison to other firms, their relative sales are not high and their total assets are much less than the total assets of Ampaco (classified as a cost leadership) and less than the average

assets of the industry. In addition, they spent too little on advertising and R&D. Three companies (Designatronics Inc., Oilgear Company and Tenny Engineering Inc.) were classified as following a focus strategy because their product line was narrow, their total assets were low - less than the average assets of the industry - and their sales were low. Moreover, Farr Company Inc., Taylor Devices, Donaldson Company Inc., and Duriron Company Inc., were all classified as following a differentiation strategy. Their sales, total assets, and fixed to total assets were low, and their advertising to sales ratio and R&D to sales ratio were relatively high.

Industry 3600 Electric and Electrical Machinery Equipment and Supply contains eight companies (Cunrac Corporation, Emerson Electric Company, General Electric Company, Litton Industries Inc., North American Philips Corporation, Philips NV-NY Shares, Tractor Inc., and Westinghouse Electric Corporation) which demonstrated strong costleadership and differentiation characteristics; therefore, they were classified as following a costleadership/differentiation strategy. Their sales, assets, and ratio of fixed to total assets were very high. Also their product lines were wide, and their advertising to sales ratio and R&D to sales ratios were high.

Industry 3681 ( Computer-Mini & Micro) included ten companies of these - Albos Computer Systems, Apollo Computer Inc., Compaq Computer Corporation, Sykes Datatronics Inc., and Wells American Corporation - had intermediate product line and relatively low sales, total assets, fixed to total assets, and they spent on advertising and R&D. These companies were classified as following a differentiation strategy. Apple Computer Inc., and Commodore International LTD had high total assets, sales, advertising to sales ratio, and R&D/sales; therefore, they were classified as following costleadership/differentiation strategy. Stratus Computer Inc., Tesdata Systems Corporation and Traid Systems Corporation had low total assets, sales, fixed to total assets, advertising/sales and R&D to sales ratio. In addition, there is no evidence of product differentiation to be found in the companies' descriptive data. Hence, they were classified as stuck in the middle.

In summary, strategy was assigned by a subjective assessment of many factors. All classifications were made before further analyses were conducted.

### 3.3 Concentration

Concentration represents a measure of the extent of control of industry output by a few firms. However, past research is inconclusive about the threshold value for concentration at which the

performance of the organizations differ significantly. Bain (1956) used 70 percent as a critical level of concentration for the eight largest companies. Meechan and Duchesnean (1973) used 55 percent concentration ratio as a threshold for the four largest companies and 70 percent for the largest eight companies. Dalton and Penn (1976) suggest this cutoff value of concentration to be 45 percent for a four firm concentration ratio and 60 percent for the eight firm concentration ratio. In this study the approach suggested by Dalton and Penn is followed for operationalization of market concentration. The reason is that their approach accounted for diversity among a firm's operations. In other words, their suggested formula is used to calculate the concentration index for multibusiness firms.

The following procedure is used to compute the concentration ratio of a firm.

a) The businesses of each firm was identified by using 10K reports filed by the firm with the SEC, annual reports (AR) and Dun and Bradstreet's Million Dollar Directory (DB). Using these sources, the 4-digit SIC Codes of the businesses had been determined.

b) The concentration ratio of the individual businesses is used to compute a weighted concentration index:

$$C = \sum_{i=1}^{n} ci \quad \frac{si}{S}$$

where:

C = the concentration index

n = the number of industries in which the firm operates

ci = the concentation ratio of the ith industry

si = the firm's sales' revenue from the ith industry

S = the total sales' revenue of the firm from all its operations

c) Firms with concentration index $\geq$ 45 percent are categorized as in the high concentration group, those with value < 45 percent are placed in the low concentration group.

The value of concentration for businesses was obtained from the 1982 Bureau of Census Publications (Census of Manufacturing Industries - Concentration Ratio). The concentration ratios are reported every four years. The 1982 values are the latest available for this study. Other data as previously mentioned are from 1984. A problem arises which is related to the stability of the concentration values over time.

Stability Test

To test the degree of stability of these values over time, three calculations were made. Each is described below. The results of these calculations supported the idea of stability for these values.

a) Stability Between Groups Over Three Cycles

Table 3 shows the stability between groups for three cycles. The table demonstrates that the groups of industries which were classified as high-concentrated ($\geq$ 45 percent) in 1972 generally retain their classification group in 1977 and in 1982. In other words, out of 60 industries only nine show change over time while 51 industries which represent 85 percent of the sample show a stability over time for the concentration values.

In summary, this table demonstrates that in general there is stability in these values over time.

Table 4 shows that for a two cycle comparison (1982 vs. 1977 values), only five industries out of 60 (8.3 percent) show instability, while the other 55 (91.7 percent) show stability over time. This means that in general for industries which classified as a high concentrated ($\geq$ 45%) in 1977 stay in the same group in 1982, and so for the industries which were classified as low concent rated (< 45 percent).

Table 3

Stability Between Groups for Three Cycles

| Consistency Table | Number of Industries | Relative Frequency (PCT) |
|---|---|---|
| Difference | 9 | 15.0 |
| ≥ 45% 1982, 1977, 1972 | 25 | 41.0 |
| < 45% 1982, 1977, 1972 | 26 | 43.3 |
| Total | 60 | 100.0 |

Table 4

Stability Between Groups for Two Cycles

| Consistency Table | Number of Industries | Relative Frequency (PCT) |
|---|---|---|
| Difference | 5 | 8.3 |
| ≥ 45% 1981, 1977 | 27 | 45.0 |
| < 45% 1982, 1977 | 28 | 46.7 |
| Total | 60 | 100.0 |

Table 5 show the correlation coefficients between the concentration values of 1982, 1977, and 1972, and also between the concentration values of 1977 and 1972. This table demonstrates that there is a high correlation between the concentration ratios of 1982 and 1977 (0.9704), between 1982 and 1972 (0.93), and between 1977 and 1972 (0.974). This means that industries which were classified as high-concentrated in one period of time are likely to be in the same group later, due to the consistency and stability of these values over time.

Table 5

The Correlation Coefficient of
1982 Concentration Values Versus 1977 and
1972 Values, and 1977 Values Versus 1972 Value

| Correlation Matrix | Values of 1977 | Values of 1972 |
|---|---|---|
| Values of 1982 | 0.97 | 0.93 |
| Values of 1977 | | 0.97 |

c) The Differences

The third calculation is related to the differences in the concentration values over the different cycles. One figure is subtracted from the other and the results tabulated. It is shown that:

1. Between 1982 and 1977

Twenty-nine industries out of 60 which represent 48.3 percent of the sample, had a difference of $\pm$ 2 percent of the base. Forty-three industries, which represent approximately 72 percent of the sample, had a difference of $\pm$ 5 percent of the base and 50 industries, which represent approximately 83 percent of the sample, had a difference within $\pm$ 7 percent of the base.

2. Between 1982 and 1972

The frequency table also shows that 16 industries, which represent approximately 27 percent of the sample, had a difference of ± 1.7 percent of the base.

Thirty-one industries, which represent approximately 50 percent of the sample, had a difference within ± 5 percent of the base over 10 years.

3. Between 1977 and 1972

There were 28 industries, which represent approximately 47 percent of the sample, that had a difference within ± 2 percent of the base over five years. Finally, 49 industries, which represent appoximately 82 percent of the sample, had a difference of ± 5 percent of the base. Clearly, the differences in regard to the concentration ratios between the three cycles are minor, which means that concentration ratios are relatively stable over time despite of minor differences for these ratios.

The previous discussion demonstrates that there is a high stability for these ratios over time. Hence, the calculations for stability between groups over two and three cycles show a high stability and that industries which were classified as high concentrated in the early cycle stayed in the same group in the succeeding cycles, and vice versa. Also the calculations show a high

correlation between the concentration values in the different cycles. Finally, the calculation for differences in these values over time shows that no major differences occurred. In brief the results show that there is a high stability for these values over time, and if there is any change it is minor, in the sense that it will not shift the industry from one classified group to another — from high to low or vice versa.

Examples of calculations for the concentration index and ratio.

Tables 6, 7, and 8 respectively show how the concentration index for a multi-business company, the concentration ratio for three digit industry, and the concentration ratio for two digit industry, has been calculated.

Table 6

Example of Calculating the

Concentration Index for A Multibusiness Company

Hewlett-Packard Company

| Ind. # | Value shipment | Concentration ratio Top 4% |
|---|---|---|
| 1 | 3269 | 44 |
| 2 | 2289 | 54 |
| 3 | 328 | 31 |
| 4 | 229 | 43 |

The following formula is used to calculate the concentration index(C)

$$C = \sum_{i=1}^{n} ci \quad \frac{si}{S}$$

where C = 47%

Table 7

Example of Concentration Ratio

for Three Digit Industry

Industry 3630 - Household Appliances

| Industry | Value Shipment | Concentration Ratio Top 4% |
|---|---|---|
| 3631 Household cooking equipment | 2414.9 | 52 |
| 3632 Household refrigerators and freezers | 2470.7 | 94 |
| 3633 Household laundry equipment | 2122.2 | 91 |
| 3634 Electric housewares and fans | 3128.4 | 38 |
| 3635 Household vacuum cleaners | 775.7 | 50 |
| 3636 Sewing machines | 229.7 | 72 |
| 3639 Household appliances | 1432.0 | 51 |

The following formula is used to calculate the three digit concentration ratio:

$$C_{R3} = \sum_{i=1}^{n} ci \quad \frac{si}{\sum_{i=1}^{n} si}$$

Where the $CR_3$ for this industry = 0.63

Table 8

Example of Calculating the Concentration Ratio for Two Digit Industry

Industry 2000 - Food & Kindred Products

| Industry | Value Shipment | Concentration Ratio Top 4% |
|---|---|---|
| 2011 Meat Packing plants | 824.6 | 29 |
| 2013 Sausages and other prepared meats | 900.9 | 19 |
| 2016 Poutry dressing plants | 9044.6 | 22 |
| 2017 Poultry and egg processing | 1426.5 | 22 |
| 2021 Creamery butter | 1686.8 | 41 |
| 2022 Cheese, natural and processed | 10762.8 | 34 |
| 2023 Condensed and evaporated milk | 4730.7 | 35 |
| 2024 Ice cream and frozen desserts | 2855.1 | 22 |
| 2026 Fluid milk | 18736.0 | 16 |
| 2032 Canned specialties | 4140.8 | 62 |
| 2933 Canned fruits and vegetables | 9283.4 | 21 |
| 2034 Dehydrated fruits, vegetables and soups | 1745.1 | 42 |

Table 8 (continued)

| Industry | Value Shipment | Concentration Ratio Top 4% |
|---|---|---|
| 2035 Pickles, sauces, and salad dressing | 4268.8 | 56 |
| 2036 Frozen fruits and vegetables | 5374.6 | 27 |
| 2038 Frozen specialties | 5061.3 | 38 |
| 2041 Flour and other grain mill products | 4932.8 | 40 |
| 2043 Cereal breakfast foods | 4131.9 | 86 |
| 2044 Rice milling | 1933.9 | 47 |
| 2045 Blended & prepared flour | 1419.1 | 58 |
| 2046 Wet corn milling | 3268.4 | 74 |
| 2047 Dog, cat and other pet food | 4402.2 | 52 |
| 2048 Prepared feeds | 11298.1 | 20 |
| 2051 Bread, cake, and related products | 13143.3 | 34 |
| 2052 Cookies and crackers | 4664.9 | 59 |
| 2061 Raw cane sugar | 1113.9 | 41 |
| 2062 Cane sugar refining | 3040.3 | 65 |
| 2063 Beet sugar | 1515.8 | 67 |

Table 8 (continued)

| Industry | Value Shipment | Concentration Ratio Top 4% |
|---|---|---|
| 2065 Confectionary products | 6773.1 | 40 |
| 2066 Chocolate and cocoa products | 2217.4 | 75 |
| 2067 Chewing gum | 915.3 | 95 |
| 2074 Cottonseed oil mills | 933.3 | 51 |
| 2075 Soybean oil mills | 8603.6 | 61 |
| 2076 Vegetables oil mills | 566.9 | 52 |
| 2077 Animal and marine fats and oils | 1752.5 | 34 |
| 2079 Shortening and cooking oils | 4905.6 | 43 |
| 2082 Malt beverages | 11183.2 | 77 |
| 2083 Malt | 661.5 | 60 |
| 2084 Wines, brandy, and brandy spirits | 996.7 | 51 |
| 2085 Distilled liquor except Brandy | 3126.1 | 46 |
| 2086 Bottled and canned soft drinks | 16807.5 | 14 |
| 2087 Flavoring extracts and syrups | 4236.8 | 65 |
| 2091 Canned and cured seafoods | 1849.1 | 62 |

Table 8 (continued)

| Industry | Value Shipment | Concentration Ratio Top 4% |
|---|---|---|
| 2092 Fresh and frozen packaged fish | 4009.1 | 14 |
| 2095 Roasted coffee | 5826.9 | 65 |
| 2097 Manufactured ice | 229.5 | 18 |
| 2098 Macaroni and spaghetti | 1065.0 | 42 |
| 2099 Food preparations | 10979.3 | 32 |

The following formula is used to calculate the two digit concentration ratio:

$$C_{R2} = \sum_{i=1}^{n} ci \quad \frac{si}{\sum_{i=1}^{n} si}$$

$CR_2$ for this industry = 0.39

3.4 Size

Size of the organization will be measured by total assets. Companies with total assets of at least $300 million were classified as large companies while those with total assets < 300 were

classified as small size companies. In this regard, the cut-offpoint followed by Chandrasekaran (1982) were followed which is at the same time close to the median.

3.5 Organization Structure

Organization structure refers to the arrangement of business units and functions within a firm to carry out the strategies of the organization. The purpose of including structure categories in this study is to measure the relative autonomy of business units and functions from the corporate level of management and how this affects performance.

Rumelt (1974), developed normative models and definitions of five structured arrangements which are described as follows:

a. Functional: organizational arrangements are based mainly on the principal business functions, namely, manufacturing, sales, finance, planning, etc.

b. Functional with subsidiaries: organization structure is basically functional, at least with respect to the major business, but also has one or more product divisions.

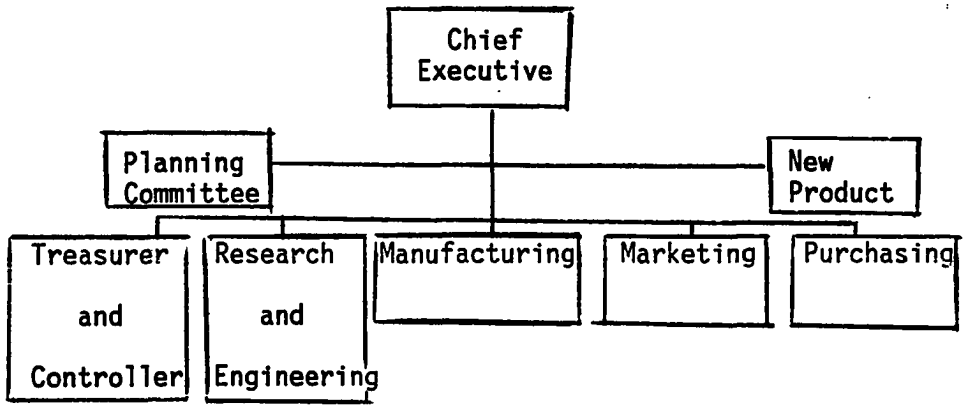
c. Product division: organization structure whereby each division has responsibility and resources for a product, or group of products and the central office performs only the coordination function.

d. Holding Company: virtually autonomous divisions with little or no central office structure except at the chief executive level.

e. Geographic division: an organization that consists of a headquarters, offices, and a group of operating divisions, each having the responsibility and resources needed to engineer, produce, and market a product or a set of products in a different geographic area.

Figure 8

Functional Structure

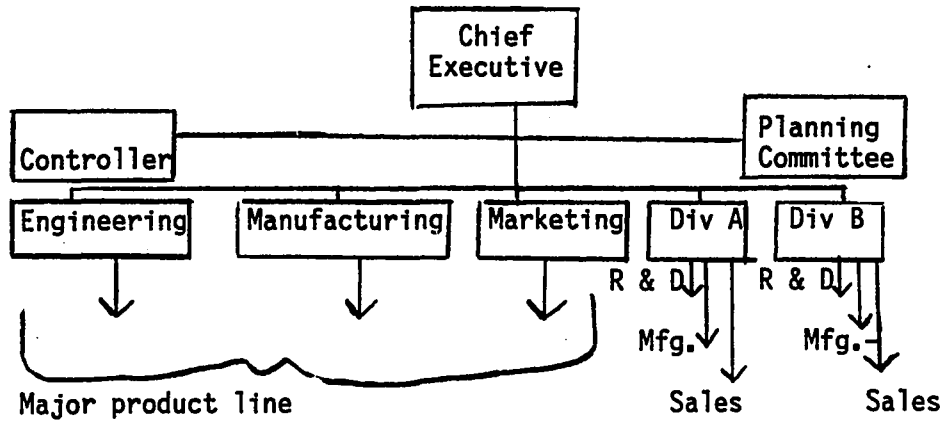



Note: There is a great variety in the way different firms define functions and in the way in which they are coordinated and related. This chart illustrates one possible pattern.

Source: Rumelt, 1974

Figure 9

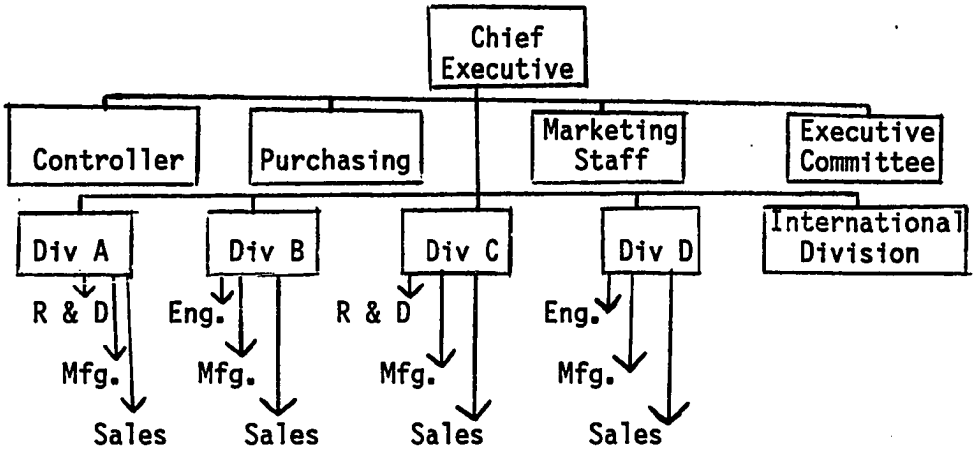
Functional with Susidiaries Structure




Source: Rumelt, 1974

Figure 10

Product Division Structure




Source: Rumelt, 1974

The perceived extent of autonomy for structural arrangements is given below:

| Organizational Structure | Extent of Autonomy |
|---|---|
| Functional | Very low |
| Functional with Subsidiaries | Low |
| Product Division | High |
| Holding Company | Very High |

The type of the organization structure has been inferred from the annual report of each of the 304 companies in the sample.

3.6 Entry Barriers

It can be measured by the following ratios:

a) R & D Expenses

Sales

b) Advertising Expenses

Sales

c) Capital Requirements

Capital requirements are estimated by calculating the average assets of the sample firms for each industry. (Masson and Qualls, 1976).

Classifying entry barriers:

For the purpose of classifying companies as operating in industries with high or low entry barriers, Bain's (1956) approach

was followed. Under that approach, industry I is considered high if it ranked high in two out of three factors. For example, if the capital requirement is high and also the R&D to sales ratio, the industry is classified as a high entry barriers industry, even though the advertising to sales ratio is not high.

3.7 Major Hypothesis

1- Performance, (p) is expected to be related to strategy; therefore, the null hypothesis of no difference is:

HO: p1=p2=p3=p4=p5

HI: not all p's are equal

Where:

P1 is the mean performance of firms pursuing focus strategy.

P2 is the mean performance of firms pursuing cost leadership strategy.

P3 is the mean performance of firms pursuing differentiation strategy.

P4 is the mean performance of firms "stuck in the middle".

P5 is the mean performance of firms pursuing cost leadership/differentiation strategy.

It is believed that company performance vary significantly across the strategy groupings, and that differences will be related to the degree of concentration and to the height of entry barriers.

3.8 Minor/Other Hypotheses

H2: Firms that follow a costleadership/differentiation strategy perform better than firms following any other strategies combined.

H3: Firms operating in markets with high concentration have significantly better performance than firms operating in markets with low concentration.

H4: Firms operating in markets with high entry barriers have significantly better performance than firms operating in markets with low entry barriers.

H5: Firms operating with a product division structure perform significantly better than firms with other types of organizational structure.

H6: Large size firms outperform small size firms.

H7: Large firms in concentrated industries earn higher profits than small firms.

H8: Large size firms operating in industries with high concentration and high entry barriers outperform small size firms in the same environment.

H9: Large firms operating in industries with high entry barriers outperform small sizes in the same environment.

H10: Firms operating in industries with high concentration and high entry barriers outperform firms operating in industries with

low concentration and low entry barriers.

H11: Firms operating in a market with high concentration and high entry barriers that are organized by product division perform better than other organizational combinations.

H12: Firms identified with at least one strategy outperform firms identified as stuck in the middle.

3.9 Non-Performance Related Hypotheses

H13: More concentrated industries are lower in advertising expenses.

H14: The more difficult the entry into an industry is, the higher the concentration.

H15: Firms operating in markets with high concentration and high entry barriers are larger in size than firms operating in markets with low concentration and low entry barriers.

H16: Large firms are more likely to adopt product division structure.

H17: Large firms operating in high concentrated industry are more likely to adopt costleadership/differentiation strategy.

H18: Firms that have product division structure are more likely to choose costleadership/differentiation strategy.

H19: Firms operating in markets with high concentration tend to choose costleadership/differentiation strategy.

H20: Large size firms operating in industries with high concentration and high entry barriers are more likely to choose costleadership/differentiation strategy.

H21: Firms that have product division structure, working in industries with high concentration and high entry barriers, are more likely to choose costleadership/differentiation strategy.

# Chapter IV

# ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the descriptive analysis of the quantitative variables, the cross tabulation analysis, and the loglinear and logit model analysis. Moreover, the Man-Whitney, Kruskal Wallis, and T-Test analyses are presented. Furthermore, a multiple comparison of structure, strategy, concentration and entry barriers groups is presented.

## Descriptive Analysis of Quantitative Variables

This section contains a descriptive analysis based upon the frequency distributions for the quantitative variables included in the study. In addition, notched boxplots for some of the key variables considered in this study are also presented.

Raw data should be rearranged in a meaningful manner so it can be described. Rearrangement might begin by grouping the raw data in a meaningful fashion. A convenient way to accomplish this is to group the raw data into categories (class intervals). By summarizing the raw data in this manner, we ought to be able to identify some properties of the sample. The result of this grouping will show the frequency in each class interval (frequency distribution). LaPin (1978) argued that the frequency distribution tells us two things:

(1) It shows how the observations cluster around a central value, and (2) It illustrates the degree of dispersion or difference between observations.

4.1 Making The Boxplot

Given that the quantitative variables have extreme values either below or beyond the median, the rule of thumb shown in Velleman and Hoaglin (1981) will be used in constructing the boxplot. Their rule of thumb contains the following:

1- Inner fences - defined as:

Lower hinge - (1.5 x H-Spread)

Upper hinge + (1.5 x H-Spread)

2- Outer fences - defined as:

Lower hinge - (3 x H-Spread)

Upper hinge + (3 x H-Spread)

3- Adjacent value - defined as the outermost data value on each end that is still not beyond the corresponding inner fence.

Using the terminology of Tukey (1977), the lower and upper hinges are, essentially, Q1 and Q3, respectively, while the H-Spread is the interquartile range, Q3 - Q1. To construct the boxplot a solid line to mark off a box from hinge to hinge were used, and the median shown as the solid line across it. Next a dashed whisker out

from each hinge to the corresponding adjacent value was run. Then each outside value was shown individually.

4.2 Notched Boxplots

It shows how to use regions of overlap or non-overlap of special intervals around each median of a boxplot. The ends of these intervals are marked by putting a notch in the side of the box. The notches in a notched boxplot define a confidence interval around the median that has been adjusted to make it appropriate for comparisons of two or more groups of data. If the intervals of the boxes do not overlap, we can be confident at about the 95 percent level that the population medians are different. The notches are placed at:

$$\text{median} \pm 1.58 \times (\text{H-Spread})/\sqrt{n}$$

The multiplying factor, 1.58, combines contributions from three different sources: the relationship between the H-Spread and the (population) standard deviation, the variablility of the sample median, and the factor used in setting confidence limits (Velleman and Hoaglin, 1981).

4.3 Return On Assets (ROA)

The ROA for the whole sample varied widely among companies ranging between -2.88634 and 0.24183. As Table 9 demonstrates, there were 44 companies (representing 14.5 percent of the sample) with a negative ROA. Only 41 companies (which represent 13.5 percent of the

sample) have ROA higher than 0.1199. Finally, there are three companies (1.0 percent of the sample) where the ROA is higher than 20 percent.

4.4 Boxplot And Notched Boxplot For ROA

1- Inner fences

$$0.03379 - (1.5 \times 0.06077) = - 0.057365$$

$$0.09456 + (1.5 \times 0.06077) = 0.185715$$

2- Outer fences

$$0.03379 - (3 \times 0.06077) = - 0.14857$$

$$0.09456 + (3 \times 0.06077) = 0.27687$$

There were 31 outlier values -- 25 values with regard to the lower hinge (which ranged between -2.886 to - 0.0586), and six values with regard to the upper hinge (which ranged between 0.195 to 0.242).

3- The 95% Confidence Interval For the true Median of ROA

$$\text{median} \mp 1.58 \times (\text{H-Spread})/\sqrt{n}$$

$$0.06523 - 1.58\ (0.06077)/\sqrt{304} = 0.05972$$

$$0.06523 + 1.58\ (0.06077)/\sqrt{304} = 0.07074$$

This indicates that the true median of ROA will lie between 0.05972 and 0.07074 with a 95 percent confidence level as Figure 11 shows.

4.5 Capital Requirement (CRQ)

Table 10 shows that 142 companies (which represent 46.7 percent of

the sample) have a capital requirement between $33.186 and $599.99 million. Moreover, 23 companies (which represent 7.6 percent of the sample) have at least $7800 million as a capital requirement.

4.6 Boxplot and Notched Boxplot For CRQ

1- Innerfences:

$$296.002 - (1.5 \times 1319.06) = -1682.588$$

$$1615.062 + (1.5 \times 1319.06) = 3593.652$$

2- Outfences:

$$296.002 - (3 \times 1319.06) = -3661.178$$

$$1615.062 + (3 \times 1319.06) = 5572.242$$

There were six industries (32 companies) for which the capital requirement was beyond the innerfences boundary. Their capital requirement ranged between $6094.00 and 18567.262 million.

3- The Confidence Interval

$$613.185 - 1.58\ (1319.06)/\sqrt{304} = 493.656$$

$$613.185 + 1.58\ (1319.06)/\sqrt{304} = 732.714$$

We can say that with confidence at the 95 percent level, the true median will lie between 493.656 and 732.714 as Figure 12 shows.

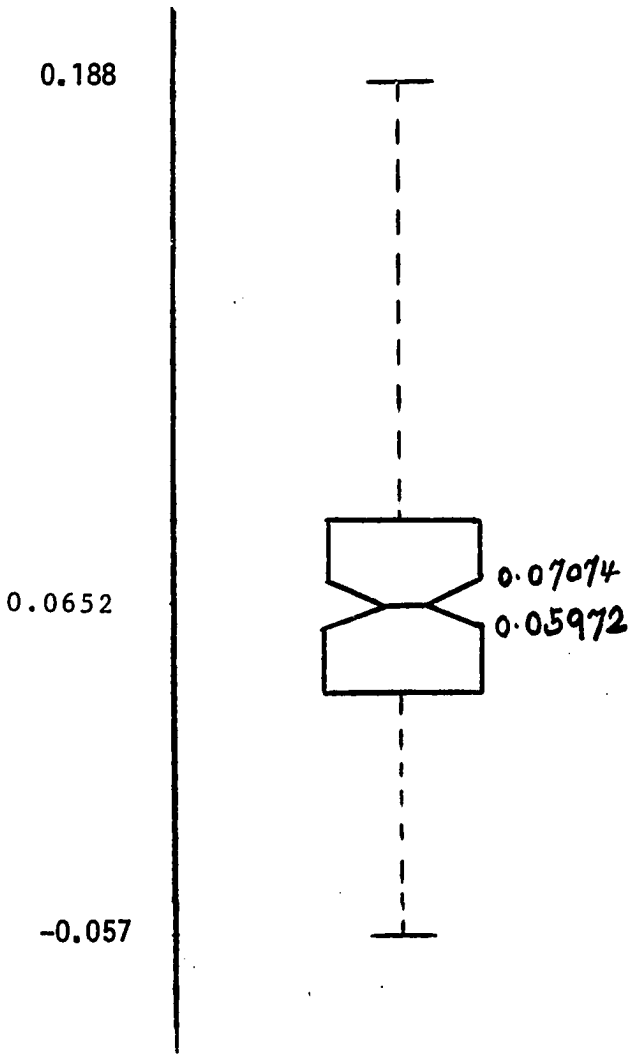
Table 9

The Distribution Of The Sample According To Their Return On Assets (ROA)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| -2.88634 (low) to - 0.0001 | 44 | 14.5 |
| 0.00 to 0.02999 | 23 | 7.6 |
| 0.03 to 0.05999 | 67 | 22.0 |
| 0.06 to 0.08999 | 79 | 26.0 |
| 0.09 to 0.1199 | 50 | 16.4 |
| 0.12 to 0.1499 | 32 | 10.5 |
| 0.15 to 0.1799 | 3 | 1.0 |
| 0.18 to 0.2099 | 3 | 1.0 |
| 0.21 to 0.2399 | 2 | 0.7 |
| 0.24 to High(0.24183) | 1 | 0.3 |
| Total | 304 | 100.0 |

Figure 11

Notched Boxplot For ROA




Note: There were 25 outlier values with regard to the lower hinge, and six outlier values with regard to the upper hinge.

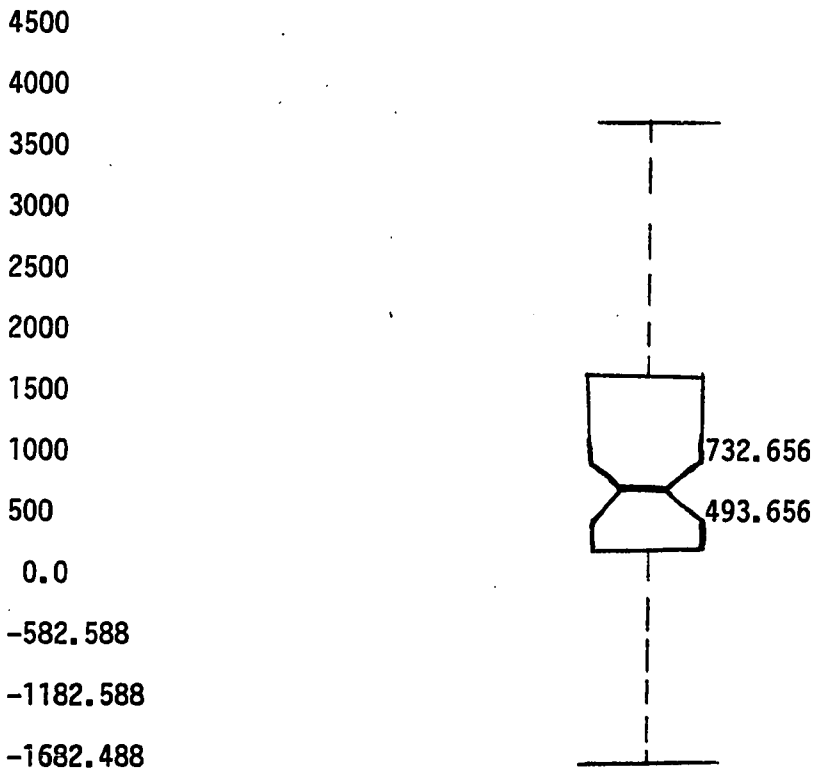
Table 10

The Distribution of the Sample According to Capital Requirement (CRQ)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| 33.186 (low) - 599.99 | 142 | 46.7 |
| 600.00 - 1199.99 | 57 | 18.8 |
| 1200.00 - 1799.99 | 35 | 11.5 |
| 1800.00 - 2399.99 | 24 | 7.9 |
| 2400.00 - 2999.99 | 10 | 3.3 |
| 3000.00 - 3599.99 | 4 | 1.3 |
| 3600.00 - 5999.99 | 1 | 0.3 |
| 6000.00 - 7199.99 | 8 | 2.6 |
| 7200.00 - 8999.99 | 6 | 2.0 |
| 9000.00 - 18567.262(high) | 17 | 5.6 |
| Total | 304 | 100.0 |

Figure (12)

Notched Boxplot for CRQ




Note: There were 32 companies for which the capital requirement was beyond the innerfences boundary. Their capital requirement ranged between $6094 and $18567.262 million.

4.7 Advertising to Sales Ratio (ADV1)

Table 11 demonstrates that 244 companies (which represent 80.3 percent of the sample) have ADV1 between 0.0 and 0.0199. Of those, 138 companies (which represent 45.4 percent of the total sample) spend nothing on advertising. Finally, the table shows that only seven companies (which represent 2.3 percent of the sample) have ADV1 higher than 10 percent.

The importance of advertising emerges from the fact that the effective advertising create entry barriers and prevents newcomers from entering the industry. Effective advertising meansthat the new competitor should add, beside the capital requirement for machines and equipment, another capital requirement for advertising.

4.8 R&D Expense to Sales Ratio (RD1)

There are 169 companies (representing 55.6 percent of the sample) with research and development to sales ratio between 0.0 and 0.0199 - as Table 12 demonstrated. In addition, there are 17 companies (which represent 5.6 percent of the sample) that have RD1 between 0.06 and 0.0799. Finally, nine companies (which represent 2.9 percent of the sample) have RD1 higher than 12 percent.

4.9 Boxplot and Notched Boxplot for RD1

1- Innerfences:

$$0.00635 - (1.5 \times 0.02822) = -0.03598$$

$$0.03457 + (1.5 \times 0.02822) = 0.0769$$

2- Outerfences:

$$0.00635 - (3 \times 0.02822) = - 0.07831$$

$$0.03457 + (3 \times 0.02822) = 0.11923$$

There were 24 companies with values beyond inner fence for the upper hinge. This ranged between 0.07906 - 0.33257

3- The Confidence Interval

$$0.0168 - 1.5\ (0.02822)/\sqrt{304} = 0.0142$$

$$0.0168 + 1.5\ (0.02822)/\sqrt{304} = 0.0194$$

This means that with a 95 percent confidence level, the true median will lie between 0.0142 and 0.0194 as Figure 13 shows.

4.10 Total Assets

There are 280 companies (which represent 92.1 percent of the sample) that have total assets between \$3.349 and \$4999.99 million as Table 13 shows. Only six companies (representing 2.0 percent of the sample) have total assets higher than \$19999.99 of which two companies (representing 0.7 percent of the sample) have total assets higher than \$45000 million.

4.11 Boxplot and Notched Boxplot for TA

1- Inner fences:

$$63.428 - 1.5\ (1383.882) = - 2012.395$$

$$1447.310 + 1.5\ (1383.882) = 3523.133$$

2- Outer fences:

$$63.428 - 3\ (1383.882) = -\ 4088.218$$

$$1447.310 + 3(1383.882) = 5598.956$$

There were 32 companies which are outlier in regard to the inner fence for the upper hinge. Their total assets ranged between $3589.131 - 63278.016 million.

3- The confidence interval for the true mean:

$$231.052 - 1.58\ (1383.882)/\sqrt{304} = 105.649$$

$$231.052 + 1.58\ (1383.882)/\sqrt{304} = 356.455$$

With a 95 percent confidence level, the true median will lie between 105.649 and 356.455 as Figure 14 shows.

Table 11

The Distribution of the Sample According to Advertising to Sales Ratio (ADV1)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 0.00 - 0.0199 | 244 | 80.3 |
| 0.02 - 0.0399 | 19 | 6.3 |
| 0.04 - 0.0599 | 17 | 5.6 |
| 0.06 - 0.0799 | 10 | 3.3 |
| 0.08 - 0.0999 | 7 | 2.3 |
| 0.10 - 0.1199 | 1 | 0.3 |
| 0.12 -High(0.25041) | 6 | 2.0 |
| Total | 304 | 100.0 |

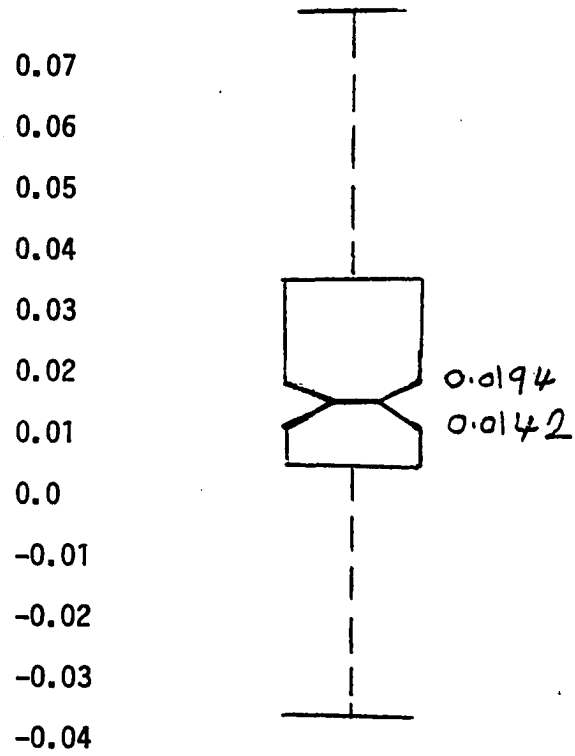
Table 12

The Distribution of the Sample According to R&D to Sales Ratio (RD1)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 0.0 - 0.0199 | 169 | 55.6 |
| 0.02 - 0.0399 | 67 | 22.0 |
| 0.04 - 0.0599 | 28 | 9.2 |
| 0.06 - 0.0799 | 17 | 5.6 |
| 0.08 - 0.0999 | 8 | 2.7 |
| 0.10 - 0.1199 | 6 | 2.0 |
| 0.12 - 0.1399 | 4 | 1.3 |
| 0.14 -High(0.33257) | 5 | 1.6 |
| Total | 304 | 100.0 |

Figure 13

Notched Boxplot for RD1




Note: There were 24 companies with values beyond the innerfence for the upper hinge. This ranged between 0.07906 and 0.33257

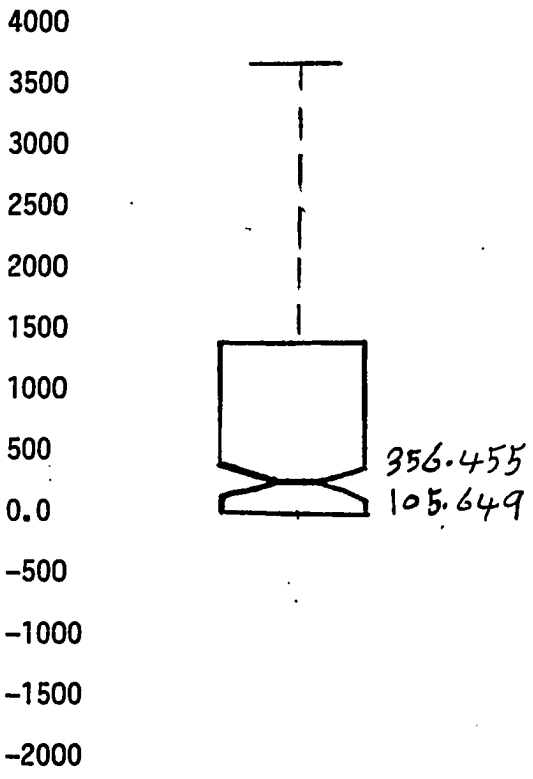
Table 13

The Distribution of the Sample
According to Total Assets (TA)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 3.34 - 4999.99 | 280 | 92.1 |
| 5000 - 9999.99 | 13 | 4.3 |
| 10000 - 14999.99 | 4 | 1.3 |
| 15000 - 19999.99 | 1 | 0.3 |
| 20000 - 24999.99 | 2 | 0.7 |
| 25000 - 39999.99 | 1 | 0.3 |
| 40000 - 44999.99 | 1 | 0.3 |
| 45000 -High(63278.016) | 2 | 0.7 |
| Total | 304 | 100.0 |

Figure 14

Notched Boxplot for Total Assets




Note: There were 32 companies which are outlier in regarding to the inner fence for the upper hinge. Their total assets ranged between $3589.131 and $63278.016 million.

4.12 Fixed Assets (FA)

The fixed assets for the 304 companies in the sample show a wide range of values (Table 14). Seventy-six companies, which represent 25 percent of the sample, have fixed assets of less than or equal to $20.749 million. One hundred fifty-two companies, representing 50 percent of the sample, have fixed assets of less than or equal to $88.129 million, while six companies, which represent 2.0 percent of the sample, have fixed assets higher than $11999.99 million.

High fixed assets for the manufacturing companies in general means that those companies are able to produce in large scale and benefit from producing with relatively low cost. The higher the fixed assets, other things being equal, the more effective and efficient the companies will be in reaching their objectives.

4.13 Sales (S)

The data in Table 15 shows a wide range of sales between companies in the sample. The table shows that 277 companies (representing 91.1 percent of the sample) have sales between $3.073 and $4999.99 million. Moreover, 50 percent of the sample have their sales less than or equal to $319.343 million. Finally, the table shows that six companies (which represent 1.9 percent of the sample) have sales between $25000 and $90854 million.

4.14 Boxplot and Notched Boxplot for Sales

1- Inner fences:

$$83.395 - 1.5\ (1733.25) = -\ 2516.48$$

$$1816.645 + 1.5\ (1733.25) = 4416.52$$

2- Outer fences:

$$83.395 - 3\ (1733.25) = -\ 5116.355$$

$$1816.645 + 3\ (1733.25) = 7016.395$$

Thirty-two companies have sales above the inner fence for the upper hinge. Their sales range between $4543.078 and 90854.000

3- The confidence interval for true median:

$$319.343 - 1.58\ (1733.25)/\sqrt{304} = 162.281$$

$$319.343 + 1.58\ (1733.25)/\sqrt{304} = 476.405$$

This means that the true median of sales will lie between 162.281 and 476.405 with 95 percent confidence level as Figure 15 shows.

Table 14

The Distribution of the Sample
According to Fixed Assets (FA)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 0.684 - 2999.99 | 286 | 94.1 |
| 3000 - 5999.99 | 8 | 2.6 |
| 6000 - 11999.99 | 4 | 1.3 |
| 12000 - 14999.99 | 2 | 0.7 |
| 15000 - 20999.99 | 1 | 0.3 |
| 21000 - 26999.99 | 1 | 0.3 |
| 27000 -High(46039.008) | 2 | 0.7 |
| Total | 304 | 100.0 |

Table 15

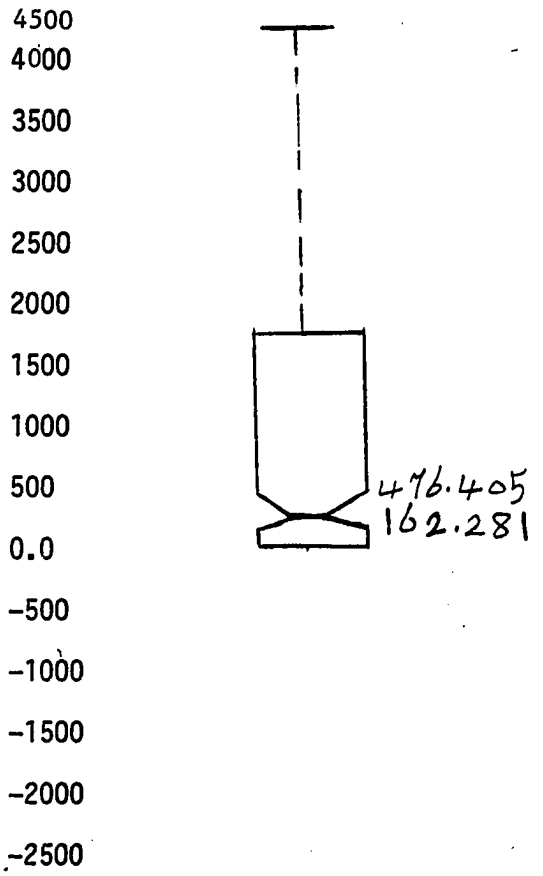
The Distribution of the Sample

According to Total Sales

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 3.073 - 4999.99 | 277 | 91.1 |
| 5000 - 9999.99 | 12 | 3.9 |
| 10000 - 14999.99 | 7 | 2.3 |
| 15000 - 24999.99 | 2 | 0.7 |
| 25000 - 34999.99 | 1 | 0.3 |
| 35000 - 44999.99 | 1 | 0.3 |
| 45000 -High(90854.0) | 4 | 1.3 |
| Total | 304 | 100.0 |

Figure 15

Notched Boxplot for Sales




Note: Thirty-two companies have sales above the inner fence for the upper hinge. Their sales range between $4543.078 and $90854 million.

4.15 Income (INC)

Table 16 shows that 29 companies which represent 9.5 percent of the sample have a negative income. This may be because of higher operating expense, low sales, unusual circumstances, or all of these factors. The table also indicates that 170 companies, which represent 55.9 percent of the sample, have income between $1.0 and 99.99 million. Moreover, 55 companies, which represent 18.1 percent of the sample, have their incomes between $300 and $14704 million. Of these, 25 companies — 8.2 percent of the sample — have their income above $800 but not higher than $14704 million.

4.16 Depreciation

Table 17 demonstrates that 222 companies (73 percent of the sample) deduct from their income between $0.093 and $49.99 million as a depreciation. Within this number, 152 companies (representing 50 percent of the sample) have a depreciation between $0.093 and $9.167 million. The table also shows that 13 companies (which represent 4.3 percent of the sample) have a depreciation higher than $449.99 million.

Table 16

The Distribution of Sample
According to Income (INC)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) - 22.62 - 0.0 | 29 | 9.5 |
| 0.01 - 99.99 | 170 | 55.9 |
| 100.00 - 199.99 | 30 | 9.9 |
| 200.00 - 299.99 | 20 | 6.6 |
| 300.00 - 399.99 | 8 | 2.6 |
| 400.00 - 499.99 | 9 | 3.0 |
| 500.00 - 599.99 | 5 | 1.6 |
| 600.00 - 699.99 | 2 | 0.7 |
| 700.00 - 799.99 | 6 | 2.0 |
| 800.00 -High(14704.0) | 25 | 8.2 |
| Total | 304 | 100.0 |

4.17 Tax

Table 18 shows that 61 companies, which represent 20.1 percent of the sample, pay no tax. In fact, 51 of these 61 companies have a loss and benefit from tax laws that allow corporate operating losses to be carried back three years, and forward five years (Weston and Brigham, 1977). This law avoids penalizing corporations whose incomes fluctuate widely, and at the same time makes some corporations attractive buys. The table shows also that 106 companies pay between $1.0 - $19.99 million as a tax. Moreover 28 companies pay between $160 - $5070 million; of these six companies (1.9 percent of the sample) pay between $1065.0 - $5070.0, and two companies (0.6 percent of the sample) pay $5041 and $5070 million respectively.

Table 17

The Distribution of Sample

According to Depreciation (DEP)

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) 0.093 - 49.99 | 222 | 73.0 |
| 50.00 - 99.99 | 27 | 8.9 |
| 100.00 - 149.99 | 18 | 5.9 |
| 150.00 - 199.99 | 7 | 2.3 |
| 200.00 - 249.99 | 8 | 2.6 |
| 250.00 - 299.99 | 2 | 0.7 |
| 300.00 - 349.99 | 3 | 1.0 |
| 350.00 - 399.99 | 2 | 0.7 |
| 400.00 - 449.99 | 2 | 0.7 |
| 450.00 - High(4965.656) | 13 | 4.3 |
| Total | 304 | 100.0 |

Table 18

The Distribution of the Sample

According to Tax

| Class Interval | Absolute Frequency | Relative Frequency (PCT) |
|---|---|---|
| (low) -218.0 - 0.0 | 61 | 20.1 |
| 0.01 - 0.999 | 34 | 11.2 |
| 1.00 - 19.99 | 106 | 34.9 |
| 20.00 - 39.99 | 27 | 8.9 |
| 40.00 - 59.99 | 16 | 5.3 |
| 60.00 - 79.99 | 14 | 4.6 |
| 80.00 - 99.99 | 6 | 1.9 |
| 100.00 - 119.99 | 4 | 1.3 |
| 120.00 - 139.99 | 3 | 1.0 |
| 140.00 - 159.99 | 5 | 1.6 |
| 160.00 - High(5070) | 28 | 9.2 |
| Total | 304 | 100.0 |

4.18 Crosstab Results

This section examines the research findings concerning the tests of hypotheses suggested in Chapter III.

The research hypotheses, as stated, consist of two types: (1) Performance related hypotheses (major and minor) reflect the suggested relationships between return on assets and concentration, entry barriers, size, structure, and strategy, and (2) non-performance related variables reflect the relationships between size, strategy and structure from one side, and concentration and entry barriers from the other side.

4.19 Hypothesis 1: The relationship between strategy and performance

The first hypothesis states that performance differs among firms, and that difference is related to the type of strategy the firm is following. Table 19 shows that ROA is significantly different according to the type of strategy followed by the firm. According to the table 60.8 percent of the firms that followed a costleadership/ differentiation strategy have a high ROA, while 77.4 percent of the firms that stuck in the middle have a low ROA. Also, 58.3 percent of the firms that followed a focus strategy have a low ROA, while 57.1 percent of the firms that followed a cost leadership have a high ROA. In general, companies that followed both cost/differentiation strategy together had a high ROA, followed by cost, differentiation and focus.

Firms that were stuck in the middle had poor performance. In summary, the results support the hypothesis that company performances vary significantly accross the strategy groupings.

4.20 Hypothesis 2: The relationship between ROA and costleadership/differentiation strategy.

The hypothesis stated that firms following a costleadership/-differentiation strategy perform better than firms following any other strategy.

Table 20 indicates that choosing a costleadership/-differentiation strategy does significantly result in high performance. Hypothesis 2 was supported. In all, 60.8 percent of companies that followed cost leadership/differentiation strategy had high performance, while only 44.4 percent of companies that followed other type of strategy had high performance.

4.21 Hypothesis 3: The relationship between concentration and performance

This hypothesis states that firms operating in markets with high concentration will be significantly better in performance than firms operating in markets with low concentration. A chi-square analysis of the cross tabulation of the concentration level and the level of ROA shows that there is no association between high concentration and high ROA. Hypothesis 3 was not supported. Table 21 shows that 50.6 percent of the companies operating in industries that are low concentrated have a high ROA, while only 48.4 percent of

Table 19

Return on Assets ROA

by Strategy

| Strategy / ROA | Focus | Cost | Differen-tiation | Stuck | Cost/ Diff. | Total |
|---|---|---|---|---|---|---|
| Low | 28 | 18 | 28 | 41 | 38 | 153 |
| High | 20 | 24 | 36 | 12 | 59 | 151 |
| Total | 48 | 42 | 64 | 53 | 97 | 304 |

$x^2$ = 23.593; 4df; Lambda Assym. = 0.232; P = 0.0001

Table 20

Return on Assets Against Cost Leadership/Diff.

Strategy by All Other Strategies

| Strategy / ROA | Other | Cost Leadership Differentiation | Total |
|---|---|---|---|
| Low | 115 | 38 | 153 |
| High | 92 | 59 | 151 |
| Total | 207 | 97 | 304 |

$x^2$ 6.45; 1df; Lambda Assym. = 0.139; P = 0.01

companies in high concentrated industries have high ROA in comparison to 51.6 percent of the companies in high concentrated industry have low ROA.

If the proposed formula by Anderson and Sclove (1974) for the direction of association of 2 x 2 tables is used, then a recognition of negative association between concentration and ROA will be reached. The following application of the formula explains that

$$\text{If} \quad \frac{a}{a+b} < \frac{c}{c+d}$$

$$a(c + d) < C(a + b)$$

$$\text{Or} \quad ac + ad < Ca + bc$$

$$\text{Or} \quad ad < bc$$

then there is a negative association. Applying this formula to the data reveals a negative association between concentration and ROA.

$$A = 87 , b = 66 , C = 89 , d = 62$$

$$87 (62) < 66 (89)$$

$$5394 < 5874$$

However, hypothesis 3 was not supported.

This result does not support the theory that firms operating in high concentrated (oligopolistic) industries are significantly higher in performance than firms operating in low concentrated industries. One problem is that the sample size used by the previous

researchers may have biased their results. For example, Dalton and Penn's (1976) sample contains 97 large food manufacturing firms, Mann's (1966) sample contains 30 industries, and McEnally's 1976 sample contains 16 industries, and Bain's (1956) sample contains 64 companies which represent the dominant firms in 20 industries.

Moreover, highly concentrated industries are highly capital intensive (because capital intensity leads to economies of scale and creates barriers to entry). This, as George and Joll (1981) argued, will result in a higher ratio of capital to sales than less concentrated industries, and profitability expressed as a return on assets will be lower.

Finally, this finding means that there should be a reconsideration of the notion of increased profitability of firms in high concentrated industries. So far the anti-trust legislation and practices have been influenced by the notion that deconcentration is more harmful to the society than concentration, in the sense that concentration helps using the society's resources in an effective and efficient way.

4.22 Hypothesis 4: The relationship between performance and entry barriers

Hypothesis 4 stated that firms operating in a market with high entry barriers have significantly better performance than firms operating in a market with low entry barriers. Table 22 shows

Table 21

Return on Assets with Different Levels of Concentration

| Concentration / ROA | Low | High | Total |
|---|---|---|---|
| Low | 87 | 66 | 153 |
| High | 89 | 62 | 151 |
| Total | 176 | 128 | 304 |

$x^2$ = 0.063; 1df, Lambda Asym. = 0.132
P = 0.802

support for this hypothesis but only at 0.07 level. However, the application of the Anderson and Sclove formula to these data indicates a positive relationship between ROA and entry barriers as follows:

$$ad > bc$$

$$72\ (96) > 81\ (55)$$

Or

$$6912 > 4455$$

This result concurs with the findings of the researchers of industrial organization economics. Consequently, there was some support for Hypothesis 4 but it was weak, at best.

4.23 Hypothesis 5: The relationship between structure and performance

This hypothesis stated that firms operating with a product division structure perform significantly better than firms with other types of organizational structure. The data presented in Table 23 are concerned with the fifth hypothesis. The overall chi-square is weakly significant. However, the results as shown in the table and below, are in the expected direction. More specifically, table 23 shows that 57.8 percent of the firms having a product division structure have a high ROA, whereas only 46.3 percent of the companies having other organization structure have a high ROA.

Finally, the result of the direction calculation showed a positive relationship between ROA and product division structure.

Table 22

Return on Assets with Entry Barriers

| Entry Barriers / ROA | Low | High | Total |
|---|---|---|---|
| Low | 72 | 81 | 153 |
| High | 55 | 96 | 151 |
| Total | 127 | 177 | 304 |

$x^2 = 3.11$; 1df; Lambda Asym. = 0.10
P = 0.078

$$ad > bc$$

$$115\ (52) > 38\ (99)$$

Or

$$5980 > 3762$$

However, there was some support for Hypothesis 5 but it was weak, at best.

4.24 Hypothesis 6: The relationship between size and performance

Hypothesis 6 predicts that large size firms outperform small size firms. Table 24 compares small size firms and large size firms with ROA. The data support this hypothesis. The table shows that there is a significant difference between large size firms (57.7 percent) and small size firms (42.6 percent) regarding the level of ROA. Large firms may have a higher ROA for the following reasons: (1) Large firms are more diversified than small ones, and their reported profit is an average of the profits of various branches and subsidiaries. Moreover, the variation in profits may be less for a diversified firm; (2) Management of large firms may be more skillful at avoiding projects that result in losses; (3) Large firms have greater market power (George and Joll, 1981), and finally, (4) Lawriwsky, (1984), argued that management discretion is related to the size of the firm. He added that discretion in the product market allows firms to raise profits above competitive levels.

Table 23

Return on Assests with the Organization Structure

| Structure / ROA | Other | Product Division | Total |
|---|---|---|---|
| Low | 115 | 38 | 153 |
| High | 99 | 52 | 151 |
| Total | 214 | 90 | 304 |

$x^2$ = 2.916; 1df; Lambda Asym. = 0.093 ;

P = 0.088

4.25 Hypothesis 7: The relationship between performance and the combination of size and concentration.

The hypothesis stated that large firms in a concentrated industry earn higher profits than small firms. Data in Table 25 shows that the overall chi-square is significant. Thus, this hypothesis is supported. The table shows that 59.2 percent of large firms in highly concentrated industry have high ROA while 35.1 percent of small firms in highly concentrated industry have high ROA.

An important question arises. Is this result due to industry concentration, or is it due to the size of the firm? The data shows no support for Hypothesis 2 - the relationship between concentration and ROA. In addition, the data in Table 25 demonstrates that 56.3 percent of large firms with low concentration have a high ROA while 43.7 percent of large firms with low concentration have low ROA. Based on that, it is believed that the result of this table is more attributed to the size than to the concentration. Finally, this conclusion does not support Lawriwsky's (1984) argument that large firms will be more profitable than small firms, and that the difference will become more marked with increase in concentration.

4.26 Hypothesis 8: The relationship between performance and the combination of size, concentration, and entry barriers

This hypothesis predicts that large size firms operating in industries with high concentration and high entry barriers outperform small size firms in the same environment. The data in Table 26

Table 24

The Relationship Between Size and Performance

| Size / ROA | Small | Large | Total |
|---|---|---|---|
| Low | 93 | 60 | 153 |
| High | 69 | 82 | 151 |
| Total | 162 | 142 | 304 |

$x^2$ = 6.36; 1df; Lambda Asym. = 0.1457;
P = 0.012

shows that the overall chi-square is highly significant. Specifically, the table shows that there is a significant difference between large firms in high concentrated and high entry barriers (84.2 percent) and small size firms in the same environment (6.5 perent) in regard to their ROA. Consequently, Hypothesis 8 was supported.

However, the results regarding the relationship between ROA and size, concentration and entry barriers are in the expected direction.

4.27 Hypothesis 9: The relationship between performance and the combination of size and entry barriers

This hypothesis predicts that large firms operating in industries with high entry barriers outperform small firms in the same environment. The data in Table 27 shows that the overall chi-square is not significant. However, the data also shows a high difference between large firms (59.6 percent) and the small firms in the same industries (46.6 percent) regarding their performance. In other words, the results are in the expected direction, but the hypothesis was not supported.

4.28 Hypothesis 10: The relationship between performance and the combined effect of entry barriers and concentration

This hypothesis stated that firms operating in industries with high concentration and high entry barriers outperform firms operating in industries with low concentration and low entry barriers. Table 28 shows that there is no support for this hypothesis. Chi-square is

Table 25

The Relationship Between Return on Assets and the Combination of Size and Concentration

| Size and Concentration / ROA | Large & High | Small & High | Total |
|---|---|---|---|
| Low | 29 | 37 | 66 |
| High | 42 | 20 | 62 |
| Total | 71 | 57 | 128 |

$x^2$ = 6.4; 1df; Lambda Asym. = 0.21 ; P = 0.011

Table 26

Return on Assets Against the Combination of Size, Concentration and Entry Barriers

| Size, Concentration & Entry Barriers / ROA | Large, High | Small, High | Total |
|---|---|---|---|
| | High | High | |
| Low | 9 | 29 | 38 |
| High | 48 | 2 | 50 |
| Total | 57 | 31 | 88 |

$x^2$ = 46.366 ; 1df ; Lambda Asym. = 0.71 ; P = 0.0

not significant.

The result of applying the Anderson and Sclove (1974) formula indicates that ad < bc, where a = 41, b = 47, c = 47, and d = 40, so

$$41 \times 40 < 47 \times 47$$

or

$$1640 < 2209$$

This suggests that there is a negative relationship between performance and the combination of entry barriers and concentration. This result is inconsistent with the notion of researchers in industrial organization economics (George and Joll, 1981), that concentration has a high effect on profits when it is combined with high entry barriers. However, the previous discussion about the relationship between performance and entry barriers shows a positive relationship. This indicates that combining another structural variable (especially concentration) reduces the influence of entry barriers on performance. In this regard Markham and Papanek, (1970) argued that the influence of structural variables on performance is likely to exhibit diminishing returns as more elements of structure are brought into the picture.

Table 27

The Relationship Between ROA and Size and Entry Barriers Combined

| Size & Entry Barriers / ROA | Large & High | Small & High | Total |
|---|---|---|---|
| Low | 42 | 39 | 81 |
| High | 62 | 34 | 96 |
| Total | 104 | 73 | 177 |

$x^2$ = 2.437 ; 1df ; Lambda Asym. = 0.62 ; P = 0.118

Table 28

The Relationship Between ROA and the Combination of Entry Barriers and Concentration

| Concentration & Entry Barriers / ROA | High & High | Low & Low | Total |
|---|---|---|---|
| Low | 41 | 47 | 88 |
| High | 47 | 40 | 87 |
| Total | 88 | 87 | 175 |

$x^2$ = 0.692 ; 1df ; Lambda Asym. = 0.07 ; P = 0.405

4.29 Hypothesis 11: The relationship between concentration, entry barriers, and organization structure combined and performance

Hypothesis 11 predicted that firms operating in a market with high concentration and high entry barriers that are organized by product division perform better than any other organizational combinations. Table 29 indicates that there is no significant relationship between adopting the product division, working in industries with high concentration and high entry barriers on one hand, and ROA on the other. Hypothesis 11 was not supported. However, the data in the table shows that 52.9 percent of the companies having a product division structure, in a highly concentrated industry with high entry barriers, had higher ROA. The data also shows that 53.7 percent of companies having other types of organzation structure and operating in the same environment, are also high performers. This indicates that the combined effect of concentration and entry barriers is more important than the organization structure.

Table 29

Rate on Assets Against Structure, Concentration and Entry Barriers

| Structure, Conc.& Entry Bar. / ROA | Others, with High Conc. & High E.B. | P.D with High Conc. E.B. | Others, with Low Conc. & E.B. | P.D. with Low Conc.& E.B | Total |
|---|---|---|---|---|---|
| Low | 25 | 16 | 42 | 5 | 88 |
| High | 29 | 18 | 27 | 13 | 87 |
| Total | 54 | 34 | 69 | 18 | 175 |

$x^2$ = 7.225 ; 3df ; Lambda Asym. = 0.161 ; P = 0.0065

4.30 Hypothesis 12: The relationship between performance and adopting no strategy

The hypothesis stated that firms identified with at least one of Porter 3 generic strategies outperformed firms identified as stuck in the middle. The data in Table 30 strongly support this hypothesis. The table shows that there is a significant difference between the performance of firms classified as stuck in the middle (22.6 percent of those firms have high ROA) and firms that adopt a strategy (55.4 percent of those firms have high ROA). This result is consistent with the argument of Porter (1980) that firms classified as stuck in the middle earn less than firms who follow differentiation, cost, focus or cost/differentiation strategy.

4.31 Hypothesis 13: The relationship between advertising and concentration

This hypothesis states that the more concentrated the industry, the less the advertising expenses will be. Table 31 shows that the Chi-square analysis of the cross tabulation of advertising level and concentration is not significant. Hypothesis 13 was not supported. In addition, application of the Anderson and Sclove formula as followed proved that there is a negative relationship between advertising and concentration level. As expected, less advertising is spent in highly concentrated industries.

Table 30

Rate on Assets Against Stuck In The Middle and All Types of Strategy

| Strategy / ROA | All Types Of Strategy | Stuck In The Middle | Total |
|---|---|---|---|
| Low | 112 | 42 | 153 |
| High | 139 | 12 | 151 |
| Total | 251 | 53 | 304 |

$x^2$ = 17.47 ; 1df ; Lambda Asym. = 0.18 ; P = 0.0

$$ad < bc$$

$$120\ (36) < 56\ (92)$$

or

$$4320 < 5152$$

In summary, the results show a weak relationship, but in the right direction. That is, 39.1 percent of the firms that have high advertising are working in industries with high concentration. This contrasts with 60.9 percent of firms that have high advertising and low concentration.

4.32 Hypothesis 14: The relationship between entry barriers and concentration

This hypothesis stated that the more difficult the entry into an industry the greater the concentration. Table 32 shows support for this hypothesis. Chi-square is significant, and there is 100 percent improvement in the ability to predict the value of the dependent variable (concentration). Moreover, the direction of the relationship is highly positive where:

$$ad > bc$$

$$87\ (87) > 0\ (0)$$

or

$$7656 > 0$$

Table 31

Concentration with Advertising

| Advertising / Concentration | Low | High | Total |
|---|---|---|---|
| Low | 120 | 56 | 176 |
| High | 92 | 36 | 128 |
| Total | 212 | 92 | 304 |

$x^2$ = 0.32 ; 1df ; Lambda Asym. = 0.0 ; P = 0.572

This result suggests that entry barriers lead to higher concentration. This result is consistent with the researchers of industrial organization economics who claim that industry structure elements are linked. According to those researchers, changes in one structural element often explain changes in another.

4.33 Hypothesis 15: The relationship between size and the combination of concentration and entry barriers.

Hypothesis 15 stated that firms operating in markets with high concentration and high entry barriers are larger in size than firms operating in markets with low concentration and low entry barriers. Data in Table 33 support this hypothesis. The data demonstrates that high concentration and high entry barriers were significantly related to large size.

Specifically, the data shows that 64.8 percent of firms operating in highly concentrated industries with high entry barriers have a large size. This is in comparison to 27.6 percent of firms operating in low concentrated industries with low entry barriers and have a large size. This means that concentration and entry barriers, taken together, have a significant effect on size.

4.34 Hypothesis 16: The relationship between size and structure

The hypothesis states that large size firms are more likely to adopt product division structure. Data in Table 34 demonstrates a significant relationship between size and structure.

Table 32

Concentration and Entry Barriers

| Entry Barriers / Concentration | Low | High | Total |
|---|---|---|---|
| Low | 87 | 0.0 | 87 |
| High | 0.0 | 88 | 88 |
| Total | 87 | 88 | 175 |

$x^2$ = 171.023 ; 1df ; Lambda Asym. = 1.0 ; P = 0.0

Specifically the data reveals that 43 percent of large firms have a product division, while only 17.9 percent of small firms have a product division. Hypothesis 16 was supported.

4.35 Hypothesis 17: The relationship between strategy and size and concentration combined.

This hypothesis predicts that large firms operating in high concentrated industry are more likely to adopt a cost leadership/differentiation strategy. The data in Table 35 support this hypothesis. These data show that large firms in highly concentrated industries are more likely to adopt cost leadership/differentiation strategy (70.4 percent) while only 54.9 percent of large firms in a low concentrated industry adopt costleadership/differentiation strategy. Moreover, only 5.3 percent of small firms in a highly concentrated industry are following cost leadership/differentiation strategy.

4.36 Hypothesis 18: The relationship between strategy and structure

This hypothesis stated that firms that have a product division structure tend to choose cost leadership/differentiation strategy. Product division structure was significantly related to cost leadership/differentiation strategy (.0006). Hypothesis 18 was supported. In sum, 46.7 percent of firms that have product division structure choose cost leadership/differentiation strategy. Conversely, only 25.7 of firms that have other types of

Table 33

Size With the Combination of Concentration and Entry Barriers

| Concentration & E.B. / Size | High Conc. & E.B. | Low Conc.& E.B. | Total |
|---|---|---|---|
| Small | 31 | 63 | 94 |
| Large | 57 | 24 | 81 |
| Total | 88 | 87 | 175 |

$x^2$ = 22.86 ; 1df ; Lambda Asym. = 0.32 ; P = 0.0

Table 34

Size with Structure

| Size / Structure | Small | Large | Total |
|---|---|---|---|
| Functional | 55 | 22 | 77 |
| Functional with Subsidaries | 41 | 36 | 77 |
| Division | 29 | 61 | 90 |
| Holding | 37 | 23 | 60 |
| Total | 162 | 142 | 304 |

$x^2$ = 27.917 ; 3df ; Lambda Asym. = 0.122 ; P = 0.0

Table 35

Strategy Against Size and Concentration

| Size and Conc. / Strategy | Large with High | Small with Low | Small with Low | Small with High | Total |
|---|---|---|---|---|---|
| Other | 21 | 32 | 100 | 54 | 207 |
| Cost/ Diff. | 50 | 39 | 5 | 3 | 97 |
| Total | 71 | 71 | 105 | 57 | 304 |

$x^2$ = 120.03 ; 3df, Lambda Asym. = 0.37 ; P = 0.0

organization structure followed cost leadership/differentiation strategy.

4.37 Hypothesis 19: The relationship between concentration and strategy.

This hypothesis states that firms operating in a market with high concentration tend to choose cost leadership/differentiation strategy. Table 37 compares low and high concentration in relation to strategy. The data support this hypothesis. The table shows that high concentration was significantly related to cost leadership/differentiation strategy. Moreover, the data shows that 56.8 percent of firms operating in a highly concentrated industry have adopted cost leadership/differentiation strategy. This is in comparison to only 5.7 percent of the firms operating in a low concentrated industry.

4.38 Hypothesis 20: The relationship between strategy size, concentration and entry barriers combined.

The hypothesis states that large size firms operating in industries with high concentration and high entry barriers are more likely to choose cost leadership/differentiation strategy. Table (38) indicates that there is a significant relationship between size, concentration and entry barriers, and the type of strategy that the firm followed. Hypothesis 20 was supported. In sum, the data shows that 84.2 percent of large firms working in industries that have a high concentration and high entry barriers have adopted

Table 36

The Relationship Between Strategy and Structure

| Structure / Strategy | Other | Division | Total |
|---|---|---|---|
| Other | 159 | 48 | 207 |
| Cost/Diff. | 55 | 42 | 97 |
| Total | 214 | 90 | 304 |

$x^2$ = 11.87 ; 1df ; Lambda Asym. = 0.0 ; P = 0.0006

Table 37

Concentration and Strategy

| Concentration / Strategy | Low | High | Total |
|---|---|---|---|
| Other Type Of Strategy | 82 | 38 | 120 |
| Cost/Diff. Strategy | 5 | 50 | 55 |
| Total | 87 | 88 | 175 |

$x^2$ = 50.6 ; 1df ; Lambda Asym. = 0.22 ; P = 0.0

cost leadership/differentiation strategy. This is in comparison to 15.8 percent of firms that are large in size and working in the same environment, but adopted other types of strategy. Moreover, the table shows that only 12.5, 3.2, and 6.5 percent of large firms with low concentration and low entry barriers, small firms with low concentration and low entry barriers; and small firms with high concentration and high entry barriers, respectively, have adopted cost leadership/differentiation strategy.

4.39 Hypothesis 21: The relationship between strategy and the combination of structure, concentration and entry barriers.

The hypothesis states that firms that have product division structure working in industries with high concentration and high entry barriers are more likely to choose costleadership-/differentiation strategy. Table (39) shows support for this hypothesis. However, the overall Chi-square is significant at 0.0. In sum, firms that have product division in a high concentrated and high entry barriers tend to choose costleadership/differentiation strategy (70.6 percent). This is in comparison with 48.1 percent of firms that are working in the same environment but have other type of organization structure. This result is consistent with Chan ler's notion (1962) that strategy follows structure.

Table 38

The Relationship Between Stragegy and Size, Concentration and Entry Barriers

| Size, Conc. E.B. / Strategy | High Conc., E.B. & Lge. Sz. | Low Conc., E.B. & Lge. Sz. | Low Conc., E.B. & Sm. Sz. | High Conc., E.B.& Sm. Sz. | Total |
|---|---|---|---|---|---|
| Other | 9 | 21 | 61 | 29 | 120 |
| Cost/Diff. | 48 | 3 | 2 | 2 | 55 |
| Totals | 57 | 24 | 63 | 31 | 175 |

$x^2$ = 109.98 ; 3df ; Lambda Asym. = 0.71 ; P = 0.0

Table 39

Strategy with Structure, Concentration and Entry Barriers

| Structure, Conc.& E.B. / Strategy | Other with High Conc. & E.B. | Division with High Conc. & E.B. | Other with Low Conc.& E.B. | Division with Low Conc. & E.B. | Total |
|---|---|---|---|---|---|
| Other | 28 | 10 | 65 | 17 | 120 |
| Cost/Diff. | 26 | 24 | 4 | 1 | 55 |
| Sub-Totals | 54 | 34 | 69 | 18 | 175 |
| Grand Total 175 | | | | | |

$x^2$ = 57.823 ; 3df ; Lambda Asym. = 0.255 ; P = 0.0

4.40 Loglinear models and other statistical techniques

This section presents the results of analysis for Loglinear models, Logit Model, Mann-Whitney, T-test, and Kruskal-Wallis.

4.41 Loglinear models

Table 40 shows the loglinear models where each model represents the best at every step (each program). Model 8 was the best model among these models. This model contains fewer terms than any of the preceding models. The likelihood ratio for this model was 50.69 with 43 degrees of freedom and a P. value equal to 0.20. It is the most parsimonious model that fits the data best.

The interpretation of this model is that: (1) ROA and size are related, (2) ROA and strategy are related, (3) size is related to structure and concentration, (4) strategy is affected by concentration, size and entry barriers, and finally, (5) the model demonstrates that entry barriers are related to concentration. These results support Hypotheses 6, 2, 16, 19, and 14, and coincide with the findings of cross tabs analysis and other statistical techniques in regard to these hypotheses.

4.42 The logit model

Logit models contain terms corresponding to those in loglinear models. This model helps in assessing the effects of categorical variables on the response variable (Fienberg, 1981). Table 40 shows that the "best" fitting but most parsimonious model is given by

Table 40

Loglinear Models

| The Model | Likelihood Statistics | D.F. | P |
|---|---|---|---|
| RC/RS/RZ/RE/RY/CS/CZ/CE/CY/SZ/SE/SY/ZE/ZY/EY | 45.59 | 36 | 0.13 |
| RC/RS/RZ/RE/RY/CS/CE/CY/SZ/SE/SY/ZE/ZY/EY | 45.78 | 37 | 0.15 |
| RC/RS/RZ/RE/RY/CS/CE/CY/SZ/SE/SY/ZY/EY | 46.23 | 38 | 0.17 |
| RC/RS/RZ/RY/CS/CE/CY/SZ/SE/SY/ZY/EY | 47.03 | 39 | 0.18 |
| RS/RZ/RY/CS/CE/CY/SZ/SE/SY/ZY/EY | 48.07 | 40 | 0.18 |
| RS/RZ/RY/CS/CE/CY/SZ/SY/ZY/EY | 48.97 | 41 | 0.18 |
| RS/RZ/RY/CS/CE/CY/SZ/ZY/EY | 49.36 | 42 | 0.20 |
| RZ/RY/CS/CE/CY/SZ/ZY/EY | 50.69 | 43 | 0.20 |

(RZ/RY/CS/CE/CY/SZ/ZY/EY) or UABC = 0. The loglinear model is therefore

$$Ln(mijk) = U + {}^{UR}_{(i)} + {}^{UZ}_{(j)} + {}^{UY}_{(k)} + {}^{UC}_{(l)} + {}^{US}_{(m)} + {}^{UE}_{(n)} + {}^{URZ}_{(ij)} + {}^{URY}_{(ik)} + {}^{UCS}_{(lm)} + {}^{UCE}_{(ln)} + {}^{UCY}_{(mk)} + {}^{USZ}_{(mj)} + {}^{UZY}_{(jk)} + {}^{UEY}_{(nj)}$$

The corresponding logit model as stated in Berenson et.al. (1983) is defined by:

$$logit_{(ijk)} = Ln\left(\frac{Mijk1}{Mijk2}\right) = 2[UR(l) + URZ(ji) + URY(ki)]$$
$$= W + WRZ_{(ij)} + WRY_{(ik)}$$

where:

$$W = 2UR(l),\ WRZ_{(j)} = 2URZ,\ \text{and}\ WRY_{(k)} = 2URY$$

Table 41 indicates that there is a positive effect of choosing a costleadership/differentiation strategy on performance and a negative effect on performenance due to other type of strategies. Moreover, the table shows that large size is positively related to performance while small size has a negative effect.

Figure 16 demonstrates graphically the relationship between ROA and the explanatory variables and the relationship between the explanatory variables for the logit model. The figure shows that there is an association between ROA, size and strategy. In addition, size is related to structure and strategy, while structure is related to concentration.

Table 41

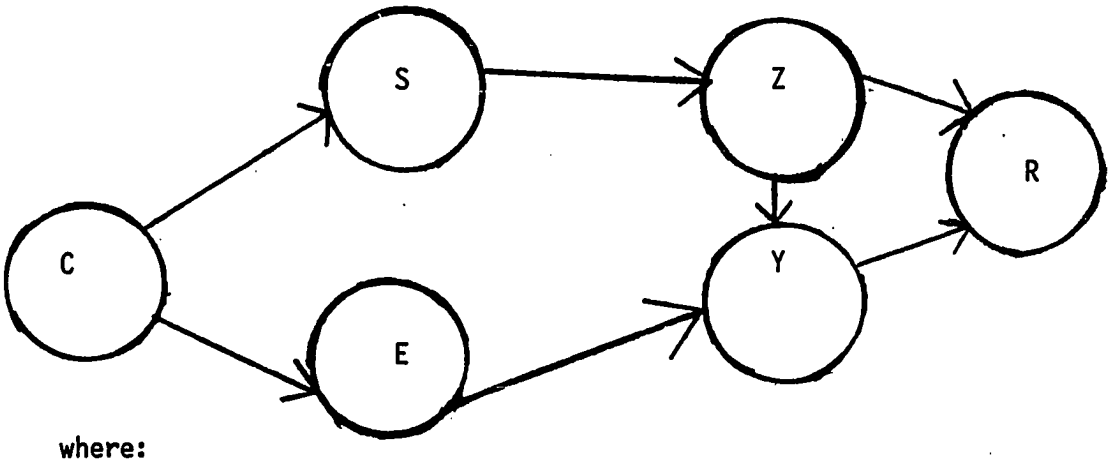
Estimated effects and logits obtained from the (RZ/RY/CS/CE/CY/SZ/ZY/EY) model for the ROA

| Explanatory Variable | ROA | | W Terms |
|---|---|---|---|
| | Low | High | |
| UR(i) (constant) | -0.041 | 0.041 | 0.082 |
| Strategy: | | | |
| Other | 0.1075 | -0.1075 | -0.2150 |
| cost/differentiation | -0.1075 | 0.1075 | 0.2150 |
| Size: | | | |
| small | 0.093 | -0.093 | -0.186 |
| Large | -0.093 | 0.093 | 0.186 |

Figure 16

Graphical Presentation of

the logit model




where:

R = ROA
C = Concentration
S = Structure
Z = Size
E = Entry barriers
Y = Strategy

Moreover, strategy is related to concentration, size and entry barriers where entry barriers are related to concentration.

The previous discussion supports the notion that large firms outperformed small firms, and that firms following costleadership/differentiation strategy outperform firms that followed any other type of strategy (Hypotheses 6, and 2 were supported). Also the discussion supports the notion that the elements of industry structure are linked, in that sense changes in one element affect the other. These findings coincided with the findings of other statistical techniques in regard to Hypotheses 16, 19, and 14, and also with the findings of previous researchers.

4.43 The odds ratio for strategy and size

Odds ratio or cross-product ratio is a basic measure of association (Fienberg, 1981).

Using the formula presented by Berenson et al (1983), the odds ratio for strategy and size may be determined.

$i = 1$

$$\text{logit1j} = \ln \frac{(M1j1)}{(M1j2)} = 0.082 + .215 = 0.297$$

$i = 2$

$$\text{logit2j} = \ln \frac{(M2j1)}{(M2j2)} = 0.082 - 0.215 = 0.133$$

$$\text{logitik} = \ln \frac{(M1k1)}{(M1k2)} = 0.082 + 0.186 = 0.268$$

$1 = 2$

$$\text{logitik} = \ln \frac{(M2k1)}{(M2k2)} = 0.082 - 0.186 = 0.104$$

The results show that the logit for both large size and costleadership/differentiation strategy is better (positive) than that for small size and other types of strategy.

The odds ratio for the costleadership/differentiation strategy and large size may be obtained by using the procedure presented by Berenson et.al. (1983).

$$\text{odds ratio} = e^{\text{logit}(ij)}$$

Thus, odds ratio (cost/differentiation)$= e^{0.297} = 1.346$

and the odds ratio (size) $= e^{\text{logit}(ik)} = e^{0.268} = 1.307.$

This odds ratio can be converted to a proportion by using the transformation suggested by Berkson (1944) as

$$P_{ij} = \frac{e^{\text{logit}(ij)}}{1 + e^{\text{logit}(ij)}} = \frac{M_{ij1}/M_{ij2}}{1 + (M_{ij1}/M_{ij2})}$$

Thus for costleadership/differentiation strategy

$$P_{ij} = \frac{1.346}{1 + 1.346} = 0.574$$

and for size

$$P_{ik} = \frac{1.307}{1 + 1.307} = 0.566$$

Therefore, we would estimate from the model that 57.4 percent

of firms following a costleadership/differentiation strategy have a high performance. Moreover, we would also estimate from the model also that 56.6 percent of large size firms have a high performance.

4.44 Differences in performance across size, entry barriers and concentration.

The mean return on assets for size, entry barriers and concentration are shown in Table 42. The data in the table support hypothesis 6 that large size firms outperform small size firms. In addition, the data also support Hypothesis 4 (but only at 0.07 level) that firms operating in markets with high entry barriers will have significantly better performance than firms operating in market with low entry barriers. Finally, the data shows no support for Hypothesis 3, which states that firms operating in markets with high concentration will outperform firms operatiang in markets with low concentration.

The T-test is used here in spite of the violation of homoscedasticity assumption. This is because the sample size is large enough for groups so that the central limit theorem can provide normality in the sampling distribution.

In addition, The Mann-Whitney Wilcoxon test was used to overcome this problem.

Table 43 shows the results of The Man-Whitney Wilcoxon test. The results are the same as in the T-test where the data support

Table 42

T-Test for differences between size, entry barriers, and concentration in regard to ROA

| Variable | No. of Cases | Mean | T Value(*) | df | P |
|---|---|---|---|---|---|
| D1(Size) | | | | | |
| Group 1(s) | 162 | 0.0011 | | | |
| Group 2(L) | 142 | 0.0755 | -3.38 | 170.29 | 0.0005 |
| D2(EB) | | | | | |
| Group 1(L) | 128 | 0.0131 | | | |
| Group 2(H) | 176 | 0.0524 | -1.46 | 153.93 | 0.074 |
| D3(Conc) | | | | | |
| Group 1(L) | 161 | 0.0301 | | | |
| Group 2(H) | 143 | 0.0423 | -0.53 | 242.09 | 0.2975 |

* The homoscedasticity assumption is violated and therefore, the separate variance T-Test is used in each case.

Table 43

Mann Whitney U-Wilcoxon Rank

Sum W Test (ROA by D1, D2, and D3

| Variable | Mean Rank | Number | Z | P |
|---|---|---|---|---|
| D1(size) | | | | |
| Group 0(S) | 136.86 | 162 | | |
| Group 1(L) | 170.34 | 142 | -3.3126 | 0.00045 |
| D2 (EB) | | | | |
| Group 0(L) | 143.74 | 128 | | |
| Group 1(H) | 158.87 | 176 | -1.4814 | 0.0693 |
| D3 (Conc) | | | | |
| Group 0(L) | 151.55 | 161 | | |
| Group 1(H) | 153.57 | 143 | -0.1994 | 0.421 |

The conclusions are the same for both of the tests, so the shape of the ROA distribution does not affect the results with such the sample size.

Hypotheses 6 an 4 and does not support Hypothesis 3. These results indicate that the shape of the ROA distribution does not affect the results with such a sample size.

In sum, these results coincide with the findings of this study where other statisitcal techniques were used, and also with the findings of the industrial organization economics' researchers.

4.45 Differences in performance across strategy and structure groups

The mean return on assets for each of the four structure groups are shown in Table 44. Since the assumption of homoscedasticity is violated the Kruskal-Wallis nonparametric test is used. The result does not show a significant association between ROA and structure ($X^2$ = 4.337, P = 0.227). Table 45 shows the mean return on assets for each of the five strategy groups. Since the assumption of homoscedasticity is violated, the Kruskal - Wallis nonparametric test is also used. The result support the notion of positive association between ROA and strategy ($X^2$ = 34.602, P = 0.00).

To uncover the difference in performance across strategy groups, concentration, and entry barriers groups, the results of Kruskal - Wallis nonparametric test were used as a basis for multiple comparison presented in the following section.

Table 44

Means Returns on Assets

for Structure Groups

| STRUCTURE GROUP | N. OF FIRMS | MEAN ROA | S.D. ROA |
|---|---|---|---|
| Functional | 77 | 0.0228 | 0.1678 |
| Functional with subsidiaries | 77 | 0.0662 | 0.0514 |
| Product division | 90 | 0.0249 | 0.3246 |
| Holding | 60 | 0.0300 | 0.1408 |

Assumption of homoscedasticity is violated so Kruskal - Wallis nonparametric test for $k$ groups is used where:

$$X^2 = 4.377, \quad P = 0.227$$

Table 45

Mean Returns on Assets

for Strategy Groups

| STRATEGY GROUP | N. OF FIRMS | MEAN ROA | S.D ROA |
|---|---|---|---|
| Focus | 52 | 0.0572 | 0.0682 |
| Cost | 41 | 0.0706 | 0.0348 |
| Differentiation | 71 | -0.0204 | 0.3944 |
| Stuck in the middle | 53 | -0.0120 | 0.1411 |
| Costleadership/ differentiation | 87 | 0.0817 | 0.0452 |

Assumption of homoscedasticity is violated, so Kruskal - Wallis nonparametric test for K groups is used where:

$$X^2 = 34.602,\ P = 0.000$$

4.46 Multiple Comparison

Several methods of simultaneous multiple comparisons between the location of all pairs of two of the K populations have been proposed. The procedure proposed by Dunn (1964) is used here. This procedure represents the simplest method available. It used the following equation:

$$\left| R_i - R_j \right| \leq Z \sqrt{\frac{N(N+1)}{12}\left(\frac{1}{ni} + \frac{1}{nj}\right)} \qquad (1)$$

Where:

$R_i$ = the mean of the ranks corresponding to the ith sample

$R_j$ = the mean of the ranks corresponding to the jth sample

Z = critical Z value

N = the population (Total sample)

ni = the sample size of group i

nj = the sample size of group j

The procedure requires that $\alpha$ should be specified. In this study $\alpha$ is specified to be equal 0.05. Moreover, the quantile point of the standard distribution that corresponds to a right - tail probability of $\alpha/k(k-1)$ should be found. This quantity is denoted by the critical Z value. For this study Z equal to:

$Z = \alpha/k(k-1)$

$Z = 0.05/20$

$Z = 0.0025$

where Z value (from the table) equal 2.807.

In application of this procedure, the investigator should calculate the right-hand side of (1). All differences of means $R_i - R_j$ that are larger than this number are considered significant at level $\alpha$. The direction of each significant difference pair is indicated by which is larger of $R_i$, $R_j$ (Gibbons, 1976).

4.47 Among strategy groups

Following is the multiple comparison among strategy groups

1. Focus with cost strategy

$$\left|152.19 - 162.78\right| \leq 2.807 \sqrt{\frac{304(305)}{12}\left(\frac{1}{52} + \frac{1}{41}\right)}$$

$$10.59 \leq 2.807 \sqrt{7726.667 \quad \frac{93}{2132}}$$

$$10.59 \leq 2.807 \quad 337.045$$

$$10.59 \leq 2.807 \quad 18.359$$

$$10.59 \leq 51.534$$

No significant difference found between the mean ranks of focus and cost strategy.

2. Focus with differentiation

$$\left|152.19 - 158.37\right| \leq 2.807 \sqrt{\frac{304(305)}{12}\left(\frac{1}{52} + \frac{1}{41}\right)}$$

$$6.18 \leq 2.807 \sqrt{7726.667 \quad \frac{123}{3692}}$$

$$6.18 \leq 2.807 \ (16.044)$$

$$6.18 \leq 45.036$$

No significant difference between the mean ranks of focus and differentiation.

3. Focus with stuck in the middle

$$\left|152.19 - 91.87\right| \leq 2.807\sqrt{7726.667\left(\frac{1}{52} + \frac{1}{53}\right)}$$

$$60.32 \leq 2.807\sqrt{7726.667\left(\frac{105}{2756}\right)}$$

$$60.32 \leq 2.807\ (17.157)$$

$$60.32 > 48.16$$

Therefore, there is a significant difference between the mean rank of focus strategy and stuck in the middle. This difference is related to the focus strategy.

4. Focus with costleadership/differentiation strategy

$$\left|152.19-179.99\right| \leq 2.807\sqrt{7726-667\ (\frac{1}{52} + \frac{1}{87})}$$

$$27.80 \leq 2.807\sqrt{7726.667\ (\frac{139}{4524})}$$

$$27.80 \leq 2.807\ (15.408)$$

$$27.80 \leq 43.25$$

There is no significant difference found between the mean ranks of focus and costleadership/differentiation strategy.

5. Cost with differentiation

$$|162.78-158.37| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{41} + \frac{1}{71}\right)}$$

$$4.41 \leq 2.807 \sqrt{7726.667 \left(\frac{112}{2911}\right)}$$

$$4.41 \leq 2.807 \ (17.242)$$

$$4.41 \leq 48.398$$

No significant difference found between the mean ranks of cost and differentiation strategy.

6. Cost with stuck in the middle

$$|162.78-91.87| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{41} + \frac{1}{53}\right)}$$

$$70.91 \leq 2.807 \sqrt{7726.667 \left(\frac{94}{2173}\right)}$$

$$70.91 \leq 2.807 \ (18.28)$$

$$70.91 > 51.312$$

There is a significant difference between cost strategy and stuck in the middle. This significant difference is related to cost strategy.

7. Cost with costleadership/differentiation strategy

$$|162.78-179.99| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{41} + \frac{1}{87}\right)}$$

$$17.21 \leq 2.807 \sqrt{7726.667 \left(\frac{128}{3567}\right)}$$

$$17.21 \leq 2.807 (16.65)$$

$$17.21 \leq 46.737$$

There is no significant difference between the mean rank of these two types of strategy.

8. Differentiation with stuck in the middle

$$|158.37-91.87| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{71} + \frac{1}{53}\right)}$$

$$66.50 \leq 2.807 \sqrt{7726.667 \left(\frac{124}{3763}\right)}$$

$$66.50 \leq 2.807 (15.957)$$

$$66.50 > 44.791$$

Therefore, there is a significant difference between the mean rank of differentiation and stuck in the middle, and that difference is attributed to the differentiation strategy.

9. Differentiation with costleadership/differentiation

$$|15.37-179.99| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{71} + \frac{1}{87}\right)}$$

$$21.62 \leq 2.807 \sqrt{7726.667 \left(\frac{158}{6177}\right)}$$

$$21.62 \leq 2.807 (14.058)$$

$$21.62 \leq 39.461$$

There is no significant difference between the mean rank of these two strategies.

10. Stuck in the middle with costleadership/differentiation

$$|91.87-179.99| \leq 2.807 \sqrt{7726.667 \left(\frac{1}{53} + \frac{1}{87}\right)}$$

$$88.12 \leq 2.807 \sqrt{7726.667 \left(\frac{140}{4611}\right)}$$

$$88.12 \leq 2.807 (15.317)$$

$$88.12 > 42.995$$

Therefore, there is a significant difference between the mean ranks of stuck in the middle and costleadership/differentiation strategy. This difference is in the direction of costleadership/differentiation strategy.

In sum, there is a significant difference between the mean rank of each type of strategy (focus, cost, differentiation, and costleadership/differentiation) and stuck in the middle, where stuck in the middle was found to be the poorest one.

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

# Chapter V

# SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter the research findings are presented. In addition, some implications of the results are presented, as well as recommendations for future research.

## 5.1 Summary

The complexity of the problem of explaining statistically the financial performance of firms has resulted in a number of largely independent areas of research that have attempted to explain such performance, each from its own perspective.

Researchers in business policy, industrial organization economics, and organization theory have explored determinants of firm performance. Empirical studies in any one of these areas have generally not been able to explain large amounts of variance in performance of firms. Each of these disciplines has its own paradigms, units of analysis and research methodologies that inhibit cross-fertilization among fields. This study integrates explanatory variables from industrial organization economics, organization theory and business policy. The overall goal of this research was to

develop a theory of business unit strategy, and/or to provide this area with more empirical research. Toward this end, three broad objectives were focused on.

First, this research sought to assess the relationship between structure and strategy — under what industry characteristics a specific type of strategy is appropriate to these characteristics.

The second objective of this research was to assess the relationship between structure and strategy — under what circumstances a specific type of strategy fits a specific type of structure — the fit that leads to higher performance.

The third objective of this research sought to identify those characteristics particular to a given market structure and organization structure that affect the selection of a specific type of strategy — under what conditions a selection of a specific type of strategy can be expected to result in a high performance.

In consideration of these objectives, three specific research questions were formulated and tested.

1. To what level does a specific type of industry structure affect performance, and how does it affect the adoption of a specific type of strategy?

2. What is the impact of organization structure on strategy selection and performance?

3. Will the selection of a combination strategy (costleadership/differentiation) result in a relatively higher performance?

To answer these research questions, hypotheses were developed and tested.

The sample used to test these hypotheses contained 304 U.S. manufacturing companies. These companies were selected because:

1. Complete financial data is available.

2. An available concentration ratios.

Compustat tapes were used to provide financial data for the firms in the sample. In addition, 10K, annual reports (AR), and Dun and Bradstreet's Million Dollar Directory (DB), were used to provide descriptive data for the 304 companies. These descriptive data were used to identify the business of each firm, and to infer the organization structure. Moreover, it was also used to aid in strategy classification. Furthermore, the publications of The Bureau of Census were used to obtain the concentration ratio for the industries that the 304 firms constituting the sample operate in.

## 5.2 Results

The following points summarize what was found in this research as presented in Chapter IV:

1. Hypotheses 1, 2 and 12 were supported.

The data showed that performance was differed among firms and that difference was related to the type of strategy followed. Moreover, the data showed that costleadership/differentiation strategy accompanied with high performance.

Furthermore, the data showed that the mean peformance for firms that followed any type of strategy was significantly higher than the mean performance of firms classified as "stuck in the middle."

2. Hypothesis 3 on the relationship between concentration and performance was not supported. This result was attributed to the sample size, which is larger than that of previous researchers, or to the high capital intensity accompanied with the concentration, or both.

3. In regard to Hypotheses 4 and 5 on the relationship between performance, entry barriers and structure, respectively, the data showed support for those hypotheses but it was weak.

4. The data showed support for Hypothesis 6 on the relationship between size and performance. The data showed that large firms have higher performance than small ones. This significant relationship between size and performance may be attributed to the following:

a) Large firms are more diversified than small ones, and so the variation in their profit is less than the undiversified ones.

b) Management of large firms may be more skillful at avoiding

projects that result in losses.

c) Large firms have relatively greater market power. Moreover, Hypothesis 7 on the relationship between performance and size and concentration combined was supported. Hypothesis 8 on the relationship between performance and the combination of size, concentration, and entry barriers was also supported.

5. Hypotheses 9, 10, 11, and 13 on the relationship between, performance and the combination of size and entry barriers, performance and the combination of entry barriers and concentration, performance and the combination of entry barriers, concentration and organization structure, and advertising and concentration, respectively, were not supported.

6. Hypotheses 14, 15, and 16 were supported. These hypotheses predicted a positive relationship between entry barriers and concentration, size and the combination of concentration and entry barriers, and size and structure, respectively.

7. Hypotheses 17, 18, 19, 20, and 21 were supported. These hypotheses predicted a significant relationship between strategy and the following: the combination of size and concentration; product division, concentration, the combination of concentration, size, and entry barriers, and the combination of structure, concentration, and entry barriers, respectively.

## 5.3 Implications and Conclusions

This research has examined the relationship between industry concentration, entry barriers, size, business unit strategies, organization structure and performance (Return On Assets) within a large sample (304 firms) of U.S. manufacturing companies. Results of this research indicate some important conclusions and implications for managerial practice and research, and for public policy formulations.

## 5.4 Implications

The results of this dissertation have implications for managerial practice and research and for public policy formulations.

The results showed that there is no relationship between concentration and performance. This result is inconsistent with the notion of the industrial organization economics researchers that firms operating in high concentrated industries have significantly higher performances than firms operating in low concentrated industries. The sample size of the previous researchers appears to influence the testing procedures and therefore their results.

(Dalton and Penn's (1976) sample contains 97 large food manufacturing firms, Qualls' (1967) sample contains 20 industries, Mann's (1966) sample contains 30 industries, McEnally's (1976) sample contains 16 industries, and Bain's (1956) sample contains 64

companies which represent the dominant firms in 20 industries). These examples uncover the fact that the previous researchers' sample size is much smaller than the sample size of this research that contains 304 U.S. manufacturing companies. Moreover, these examples gave the impression that some of the previous studies not only used a smaller sample size but also leaned toward the large and dominant firms in the industries or they just limited themselves to one industry. Another factor that may affect the result of this research in regard to the relationship between performance and strategy is the fact that the high concentrated industries are highly capital intensive, which eventually leads to lower the profitability expressed as a rate on assets. This finding means that there is a need for reconsideration of the notion of industrial organization economics researchers that profitability is higher for firms operating in high concentrated industries. So far the antitrust legislation and practices have been influenced by that notion and by the idea that deconcentration is more harmful to society than concentration, in the sense that concentration helps in using the society's resources efficiently and deconcentration has the danger of reducing efficiency by the shift in output to smaller, higher cost firms. Based upon the results of this research, there is a need to review the anti-trust legislation and practices.

From the managerial perspectives the following results of this research are of importance.

First, the size is shown to be significantly related to performance. This positive relationship keeps consistent and significant even when size is combined with other industry structure elements, such as concentration and entry barriers.

Second, adopting a costleadership/differentiation strategy showed a consistent and significant effect on performance. Moreover, the results showed that the environmental variables did influence the type of strategy to be adopted. Furthermore, it has shown that size, concentration, structure, and entry barriers have an influence on the type of strategy to be choosen either individually or in combination. Finally, the results suggested that for large firms, operating in high concentrated industry, high entry barriers, having product division structure, adopting a costleadership/differentiation strategy will result in higher performance than adopting another type of strategy. None of the previous studies have addressed this combination of environmental variables.

Third, the results of this research showed that there is a significant interrelationship between industry structure elements, strategy, and organization structure. For example, the results showed that there is a significant relationship between concentration and entry barriers, size and structure, size and the combined effect

of entry barriers and concentration, strategy and structure, and strategy and the industry structure elements, either individually or in combination.

5.5 Recommendations for Future Research

Suggestions for future research stem mostly from the limitations of this study. These limitations, as mentioned earlier, are that only manufacturing companies were considered in this study, and the problem of operationalizing the strategy. Therefore, a logical extension of this study would be:

1. Include service companies. This would help show the limits of the generalizations drawn in this study.

2. Revalidation of the study findings of the absence of a concentration effect on performance. The results contends that firms in high concentrated industries do not earn higher return on assets than firms in low concentrated industries. Moreover, the results showed that there is a negative relationship between concentration and peformance. Future research should reappraise and refine this finding with the objective of providing more empirical validity and also to encourage people who formulate public policy to modify their policies toward oligopoly.

3. Assessing strategy based solely on published financial and descriptive data is a difficult task. Simplifying the method of

classifying strategy can lead to inaccuracies. If more information could be obtained from companies in regard to strategies that they are pursuing, the results of this study could be improved. Collecting data from the companies directly is very difficult and time consuming but it seems that there is no other option, especially if the researcher wants to know the firm's environment in depth, and so describe the strategy in a more objective way.

4. There is a need for further development in strategy operationalization. As mentioned earlier, there are few strategy typologies developed at this time. Considering the industry structure and developing typologies contingent on that structure are necessary. For example, if similar strategic groups appear in different industries, research is needed to be conducted to determine the factors that affect the formation of strategic groups within these industries.

5. The effect of environmental variability on organization performance needs a careful evaluation. Further research may lead to better understanding of what strategies work best under different conditions.

6. Industry structure, organization structure, strategy and performance relationship need to be studied contingent on a firm's position in its life cycle.

7. Finally, a longitudinal study would help clarify many open questions about the relative influence of environmnetal factors on strategy selection and ultimately on performance.

## 5.6 Conclusions

One of the most important findings of this research is concerned with relating performance to industry concentration. The research results showed that there is no significant relationship between concentration and performance. In fact, the results showed a negative association between concentration and ROA. These results do not support the theory that firms operating in high concentrated industries are significantly higher in performance than firms operating in low concentrated industries. It is believed that the sample size used by previous researchers (as mentioned earlier) whose findings support this theory, has influenced the testing procedures and so the results of their research.

Another factor that may affect this result may be related to the fact that concentrated industries are highly capital intensive. This, as George and Joll (1981) argued, will result in a higher ratio of capital to sales than less concentrated industries, and profitability expressed as a rate on assets will be lower.

The second important conclusion is that the size of the firm is significantly related to performance. In other words, large size

firms outperform small ones. Moreover, size seems to be related to performance when it is combined with concentration, and when it is combined with concentration and entry barriers. This is an interesting result that reveals the influence of size on performance separately, or when it is combined with other variables. Hence, the data showed that concentration by itself was not related to performance, and the entry barriers performance relationship was weak at best. This means that the significant relationship between size and both concentration and entry barriers did indeed change the direction of association between performance and concentration and entry barriers from negative and weak to a significant relationship when combined with size.

Another conclusion is that adopting a combination strategy (costleadership/differentiation) resulted in higher performance than adopting other types of strategies. Moreover, the results showed that the environmental variables influenced the type of strategy to be adopted. In other words, the findings showed that when size is large and concentration is high firms tended to choose costleadership/differentiation strategy. Also, it was shown that strategy and structure are interrelated where firms with product division structure tended to adopt costleadership/differentiation strategy. Moreover, when concentration is high the study showed

that firms tended to choose costleadership/differentiation strategy. Furthermore, the data showed that when size is large, concentration and entry barriers are high, firms tended to choose costleadership/-differentiation strategy. Finally, the results showed that when concentration and entry barriers are high, and the product division structure was adopted, firms tended to adopt costleadership/-differentiation strategy.

The third conclusion is that there is an interrelationship between industry structure elements, strategy and organization structure. The data showed that (1) concentration and entry barriers are highly related, (2) size and the combination of concentration and entry barriers are highly related, (3) structure and size are highly related, (4) strategy and the combination of size and concentration were significantly related, (5) strategy and structure were highly related, (6) strategy and concentration were highly related, (7) strategy and the combination of size, concentration and entry barriers were highly related, and (8) strategy with the combination of structure, concentration and entry barriers was significantly related.

## REFERENCES

Almarin, Phillips, "A Critquie of Empirical Studies of Relations Between Market Structure and Profitability," The Journal of Industrial Economics, V.XXIV (June 1976), pp. 241-249.

Anderson, T.W., and Sclove, S.L., Introductory Statistical Analysis (Houghton Mifflin Company, 1974).

Andrews, K.R., The Concept of Corporate Strategy (New York, Dow Jones-Irwin, 1971).

Anselmar, R., "Market Structure and Research Intensity in High-Technological-Opportunity," The Journal of Industrial Economics, V.XXXIV (September 1985,) pp. 69-71.

Ansoff, H. I., Brandenburg, G., Portner, E., and Radosevich, R., Acquisition Behavior of U.S. Manufacturing Firms, 1946-1965 (Vanderbilt University Press, 1971).

Aquilar, F., Scanning the Business Environment (New York, Macmillan, 1967).

Bain, J.S., Barriers to New Competition (Cambridge, Mass., Harvard University Press, 1956).

_____, Industrial Organization, Second Edition (New York, Wiley, 1968).

_____, Essay on Price Theory and Industrial Organization (Boston, Mass., Little Brown, 1972).

_____, Barriers to New Competition (Cambridge, Mass., Harvard University Press, 1976).

Berenson, M.L., Levine, D.M., and Goldstein, M., Intermediate Statistical Methods and Applications (Prentice-Hall, Inc., Englewood Cliffs, N.J., 1983).

Berkson, J., "Applications of the Logistic Function to Bio-Assay," Journal of the American Statistical Association, V.39 (1944), pp. 357-365.

Biggadike, E.R., Corporate Diversification: Entry, Strategy, and Performance (Cambridge, Mass., Harvard University Press, 1979).

Bloom, P., and Kotler, P., "Strategies for High Market-Share Companies," Harvard Business Review, V.53 (1975), pp. 63-72,

Bothwell, J.L., Cooley, T.F., and Ham, T.E., "A New View of the Market Structure - Performance Debate", The Journal of Industrial Economics, V.XXXIV, N.4 (1984), pp. 397-417.

Bower, J.L., Managing the Resource Allocation Process: A Study of Corporate Planning and Investment (Homewood, III, Irwin, 1970).

Brooks, D., Market Structure and Seller Profitabilities: The Impace of Buyer Concentration (San Diego, CA, San Diego State University, University Press, 1973).

Burns, T., and Stalker, G.M., The Management of Innovation (London, Tavistock Institute, 1961).

Buzzell, R.D., Gale, B.T., and Sultan, G. M., "Market Share: A Key to Profitabilit," Havard Business Review, V.53 (1975), pp. 97-106.

Camanor, W. S., and Wilson, T. A. "Advertising Market Structure and Performance", The Review of Economics and Statistics, V.XLIX, N.4 (November 1967), pp. 423-440.

Catry, B., and Cheyalier, M. "Market Share Strategy and the Product Life Cycle." Journal of Marketing, V.38 (1974), pp. 29-34.

Caves, R., American Industry: Structure, Conduct and Performance (Third Edition, Englewood Cliffs, N.J., Prentice-Hall, 1972).

_____, American Industry, Conduct, Performance (Fourth Edition, Prentice-Hall, Inc. , 1977).

_____, and Porter, M., "From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition," Quarterly Journal of Economics, V.91 (1977), pp. 241-262.

_____, and Porter, M., "Market Structure, Oligopoly, and Stability of Market Share", Journal of Industrial Economics, V.26 (1978), pp. 289-313.

Chandler, A.D., Strategy and Structure: Chapters in the Historyof the American Industrial Enterprise (Cambridge, Mass. MIT Press, 1962).

_____, Strategy and Structure, (Anchor Books, 1966).

Chandrasekaran, G., Strategy, Structure, Market Concentration and Organization Performance, Unpublished Doctoral Dissertation, State University of New York at Buffalo (1982).

Chanon, D.F., The Strategy and Structure of British Enterprise, Unpublished Doctoral Dissertation, Harvard Univesity (1971).

Child, J., "Managerial and Organizational Factors Associated with Company Performance - Part I", Jouranl of Management Studies, V.11 (1974), pp. 115-189.

Clarke, R., Davies, S., and Waterion, M., "The Profitabilities - Concentration Relation: Market Power or Efficiency?" The Journal of Industrial Economics, V.XXXII (June 1984), pp. 435-450.

Cooper, A., and Woo, C., "Strategies of Effective Low Market Share Business," Academy of Management Proceedings, V.40 (1980), pp. 21-25.

Craig, S., and Douglas, S., "Strategic Factors Associated with Market and Financial Performance", Quality Review of Economics and Business, V.22 (1982), pp. 101-112.

Cyert, R.M., and March, J.G., A Behavioral Theory of the Firm (Englewood Cliffs, N.J., Prentice-Hall, 1963).

Datta, Y., "Competitive Strategy and Performance of Firms in the U.S. TV-Set Industry: 1950-1960," Academy of Management Proceedings, V.39 (1979), pp. 113-117.

Dalton, J.A., and Penn, D.W., "The Concentration Profitability Relationship: Is There a Critical Concentration Ratio?" The Journal of Industrial Economics, V.XXV (1976), pp. 133-142.

Demsetz, H. "Industry Structure, Market Rivalry, and Public Policy," The Journal of Law and Economics, V.16 (1974), pp. 1-9.

Dess, G.G., and Davis, P.S., "Porter's (1980) Generic Strategies as Determinants of Strategic Group Membership and Organizational Performance," Academy of Management Review, V.27 (1984), pp. 467-488.

Duetsch, L.L., "Advertising and Profitability Among Large Industrial Corporations," Quarterly Review of Economics and Business, V.22 (1982), pp. 81-88.

Dunn, O.J., "Multiple Comparison Using Rank Sums", Technometrics, v.6 (1964), pp. 245-252.

Fienberg, S.E., The Analysis of Cross-Classified Categorical Data (The MIT Press, Cambridge, Mass., 1981).

Fruhan, W.E., Jr., "Pyrrhic Victories in Fights for Market Share," Harvard Buisness Review, V.50 (1972), pp. 100-107.

Galbraith, J.R., Designing Complex Organizations, (Reading, Mass., Adison-Wesley, 1973).

Gale, B.T., "Market Share and Rate of Return," Review of Economics and Statistics, V.54 (1972), pp. 412-423.

Gibbons, J.D., Non Parametric Methods for Quantitative Analysis (Holt, Rinehart and Winston, 1976).

Grabowski, H.G., and Mueller, D.C., "Industrial Research and Development, Intangible Capital Stocks, and Firm Profit Rates," The Bell Journal of Economics (1978), pp. 328-343.

Hall, W.K., "SBUs: Hot, New Topic in the Management of Diversification," Business Horizons, V.21 (1978), pp. 17-25.

Hall, M., and Weiss, L., "Firm Size and Profitability," Review of Economics and Statistics, V.49 (1967), pp. 319-331.

Hambrick, D.C., "Some Tests of the Effectiveness and Functional Attributes of Miles and Snow's Strategic Types," Academy of Management Journal, V.26 (1983), pp. 5-26.

Hambrick, D.C., "Operationalizing the Concept of Buisnes-Level Strategyin Research", Academy of Management Review, V.5 (1980), pp. 567-575.

Hambrick, D.C., and Schecter, S.M., "Turnaround Strategies for Mature Industrial Product Business Units, " Academy of Management Journal, V.26 (1983, pp.231-248.

Hammermesh, R.G., Anderson, M.J., and Harris, J.B., "Strategies for Low Market Share Businesses", Harvard Business Review, V.56 (1978), pp. 95-102.

Hammermesh, R.G., and Silk, S.B., "How to Compete in Stagnant Industries", Harvard Business Review, (September-October 1979), pp. 161-168.

Harrigan, K.R., "An Application of Clustering for Strategic Group Analysis," Strategic Management Journal, V.6 (1985), pp. 55-73.

Harrigan, K.R., "Strategy Formulation in Declining Industries", Academy of Management Review, V.5 (1980a), pp. 599-604.

Harrigan, K.R., "Barriers to Entry and Competitive Strategies," Strategic Management Journal, V.3 (1981), pp. 395-412.

Hatten, K.J., Schendel, D.E., and Cooper, A.C., "A Strategic Model of the U.S. Brewing Industry: 1952-1971." Academy of Management Journal, V.21 (1978), pp. 592-610.

Hike, J.C., "Excess Capacity and Entry: Some Empirical Evidence", The Journal of Industrial Economics, V.XXXIII (1984), pp. 233-239.

Hedley, B., "Strategy and the "Business Portfolio", Long Range Planning, V.101 (1977), pp. 9-15.

Hirschen, M., "Intangible Capital Aspects of Advertising and R&D Expenditures", The Journal of Industrial Economics, V.XXX (1982), pp. 375-390.

Hofer, C.W., and Schendel, D., Strategy Formulation: Analytical Concepts, (St. Paul: West. 1978).

Jones, J.C.H., Landadio, L., and Percy, M., "Profitability and Market STructure: A Cross-Section Comparison of Canadian and American Manufacturing Industry", The Journal of Industjrial Economics, V.XXV (1977), pp. 195-211.

Khandwalla, P.N., "Effect of Competition on the Structure of Top Management Control", Academy of Management Journal, V.16 (1973), pp.285-295.

Lapin, L.L., Statistics for Modern Business Decisions (Second Edition, Harcourt Brace Jovanovich, Inc., 1978).

Lawrence, P.R., and Lorsch, J.W., Organization and Environment: Managing Differentiation and Integration (Homewood, III: Irwin, 1969).

Lawriwsky, M.L., Corporate Structure and Performance (St. Martin's Press, Inc., 1984).

Learned, E. P., Christensen, C.R., Andrews, K.R., and Guth, W., Business Policy (Homewood, III: Irwin, 1969).

Lorsch, J.W., and Allen, S.A., Managing Diversity and Interdependence: An Organizational Study of Multidivisional Firms (Boston: Harvard Business School, 1973).

Lorsch, J.W., and Morese, J.J., Organizations and Their Members: A Contingency Approach (New York,: Harper and Row, 1974).

Mann, H.M., "Seller Concentration, Barriers to Entry, and Rates of Return in Thirty Industries, 1950-1960," Review of Economics and Statistics, V.48 (1966), pp. 296-207.

Markham, J.W., and Papanck, G.H., Industrial Organization and Economic Development in Honor of E.S. Mason (Houghton Mifflin, Boston, 1970).

Martin, S., "Entry Barriers, Concentration, and Profits", Southern Economic Journal, V.46 (October 1979), pp. 471-488.

Mason, E.S., "Price and Production Policies of Large Scale Enterprise", American Economic Review, V.29 (March 1939), pp. 61-74.

Masson, R.T., and Qualls, D.P., Essays on Industrial Organization in Honor of Joe S. Bain (Ballinger Publishing Company, 1976).

McEnalluy, R. W., "Competition and Dispersion in Rates of Return: A Note," Journal of Industrial Economics, V.25 (September 1976), pp. 417-427.

Mecham, J.W., and Ducheneau, T.D., "The Critical Level of Concentration: An Empirical Analysis", Journal of Industrial Economics, V.22 (September 1973), pp. 21-36

Meisel, J.B., and Lin, S.A., "The Impact of Market Structure on the Firm's Allocation of Resources to Research and Development," Quarterly Review of Economics and business, V.23 (Winter, 1983), pp. 28-43.

Miles, R.E., and Snow, C., Organizational Strategy, Structure, and Process (New York, McGraw-Hill, 1978).

Miller, D., and Friesen, H., "Strategy-Making in Context: Ten Empirical Archetypes", Journal of Management Studies, V.14 (1977), pp. 254-280.

Mintzberg, H., "Policy as a Field of Management Theory", Academy of Management Review, V.2 (1977), pp. 88-103.

Mintzberg, H., "Patterns in Strategy Formation", Management Science, V.24 (May 1978), pp. 934-948.

Newman, H.H., "Strategic Groups and the Structure/Performance Relationship", Review of Economics and Statistics, V.56 (1978), pp. 417-427.

Orr, D., "An Index of Entry Barriers and Its Application to the Market Structure Performation Relationship", Journal of Industrial Economics (September 1974), pp. 39-49.

Orr, D., "The Determinants of Entry: A Study of the CVanadian Manufacturing Industries." Review of Economics and Statistics (February 1973), pp.58-66.

Osborn, R.C., "Concentration and the Profitabilities of Small Manufactuirng Corporations", Quarterly Review of Economics and

Business, V.56 (Summer, 1970), pp. 15-26.

Porter, M.E., "The Structure Within Industries and Companies' Performance", Review of Economics and Statistics, V.61 (May 1979), pp. 214-227.

_____, How Competitive Forces Shape Strategy," Harvard Business Review (March-April 1979), pp. 137-165.

_____, Note on the Structural Analysis of Industries (Boston: Intercollegiate Case Clearing House, 1974).

_____, Competitive Strategy (New York: The Free Press, 1980).

_____, "The Contribution of Industrial Organization to Strategic Management," Academy of Management Review, V.6 (1981), pp. 609-620.

_____, "How Competitive Forces Shape Strategy", in Strategic Management, Edited by Hamermesh, R.G. (John Wiley and Sons, Inc., 1983), pp. 35-49.

Peltzman, S., "The Gains and Losses From Industrial concentration", The Journal of Law and Economics, V.20. (1977), pp. 229-263.

Qualls, D., "Concentration, Barriers to Entry, and Long Run Economic Profit Margins", Journal of Industrial Economics and Statistics (May 1967), pp. 146-158.

Ravenscraft, D. J., "Structure-Profit Relationships at the Line of Business and Industry Level", Review of Economics and Statistics, (1983), pp. 22-31.

Rhoades, S.A., "Concentration, Barriers and Rates of REturn: A Note", Journal of Industrial Economics (1966), pp. 82-88.

Richman, D.J., Marketing Today (CBS College Publishing, 1985).

Rumelt, R.P., Strategy, Structure, and Economic Performance (Boston: Harvard University, 1974).

Salop, S.C., "Strategic Entry Deterrence", American Economic Review, V.69 (May 1979), pp. 335-338.

Schmalensee, R., "Entry Deterrence in the Ready-to-eat Breakfast Cereal Industry", Bell Journal, V.9 (1978), pp. 305-327.

Scherer, F., Industrial Market Structure and Economic Performance (Chicago: Rand-McNally, 1970).

Schoeffler, S., Buzzell, R., and Heany, D., "Impact Of Strategic Planning on Profit Performance", Harvard Business Review, V.52 (1974), pp. 108-121.

Smiley, R., "Learning and the Concentration-Profitability Relationship", Quarterly Review of Economics and Business, V.22 (Summer 1982), pp. 27-40.

Spence, A.M., "Entry Capacity Investment and Oligopolistic Pricing", Bell Journal, V.8 (Autumn 1977), pp. 534-544.

"Investment Strategy and Growth in a New Market", Bell Journal, V.10 (1979), pp. 1-9.

Stigler, G.J., Capital Rates of Return in Manufacturing Industries (Princeton: Princeton University Press, 1963).

_____, The Theory of Price (New York: Macmillan, 1966).

Stonebreakerk, R. J., "Corporate Profits and Risks of Entry", Review of Economics and Statistics, V.58 (1976), pp. 33-39.

Thomadakis, S.B., "A Value-Based Test of Profitability and Market Structure", Review of Economics and Statistics, V.59 (1977), pp. 179-185.

Tremblau, V., "Strategic Groups and the Demand for Beer", The Journal of Industrial Economics, V.XXXIV (1985), pp. 183-198.

Tukey, J.W., Exploratory Data Analysis (Reading, Mass: Addison-Wesley, 1977).

Velleman, P.F., and Hoaglin, D.C., Applications, Basics, and Computing of Exploratory Data Analysis (Duxbury Press A Division of Wadsworth, Inc., Belmont, CA, 1981).

Vernon, J.M., and Nourse, R.E., "Profit Rates and Market

Structure of Advertising Intensive Firms", Journal of Industrial Economics, V.22 (1973), pp. 1-20.

Weston, J.F., and Brigham, E.F., Essentials of Managerial Finance (Fourth Edition, Dryden Press, 1977).

White, R.E., and Hamermesh, R.G., "Toward a Model of business Unit Performance: An Integrative Approach", Academy of Management Review, V.6, (1981), pp. 213-223.

Williamson, O.E., Corporate Control and Business Behavior (Englewood cliffs, N.J., Prentice-Hall, 1970).

, Markets and Hierarchies: Analysis and Antitrust Implications (New York: Free Press, 1975).